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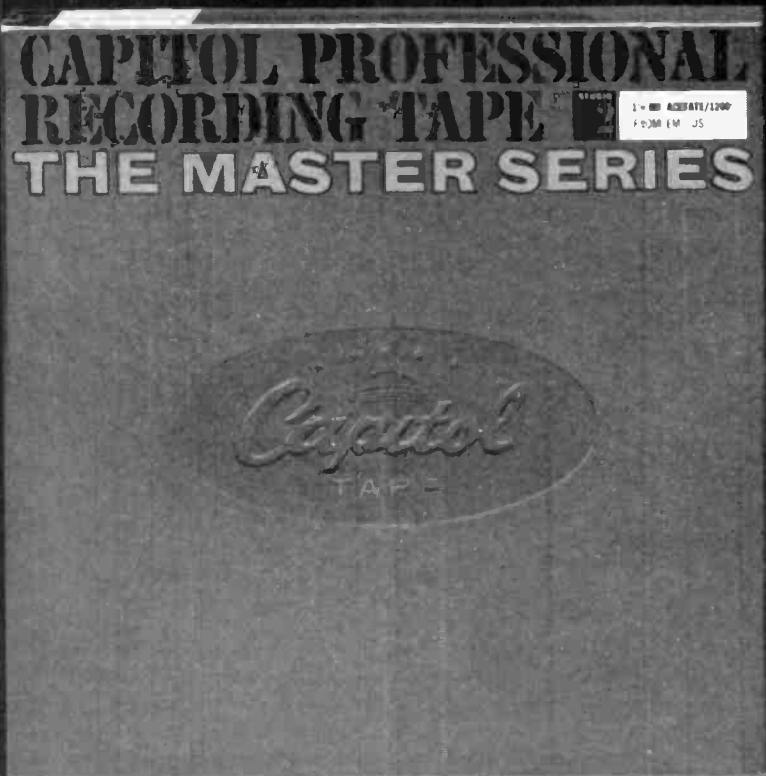
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TAPE RECORDING

VOL. 9 No. 5

APRIL 1962

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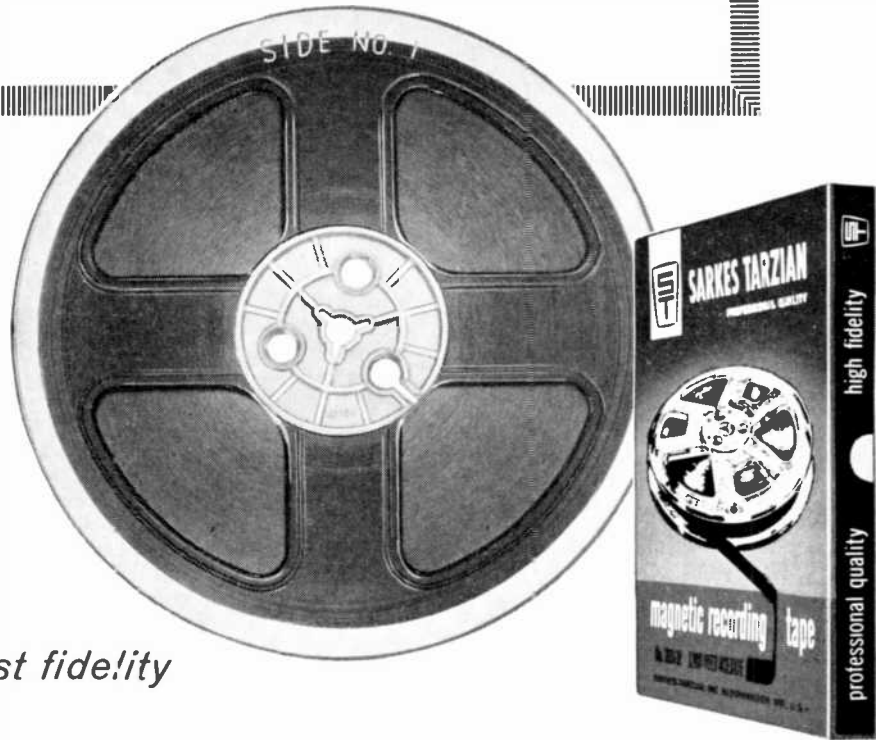
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NEW TAPES

★—Fair

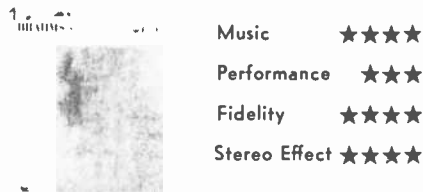
★★—Good

★★★—Very Good

★★★★—Excellent

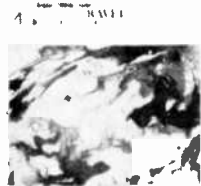
CLASSICAL

Reviewed by Robert E. Benson



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

BRAHMS: Symphony No. 2 in D, Op. 73
Pittsburgh Symphony Orchestra cond. by
William Steinberg
COMMAND 11002
4-track, 7½ ips
\$7.95...37 min.



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

RAVEL: Daphnis and Chloe Suite No. 2
Alborada del Gracioso La Valse
Colonne Orchestra conducted by Pierre
Dervaux
COMMAND 11005
4-track, 7½ ips
\$7.95...38 min.

COMMAND has had extraordinary success with their popular releases, and now they have ventured into the classical field. The results, as evidenced by the above two tapes, vary greatly.

First of all, the basic quality of sound of the two orchestras involved is vastly different. The Colonne organization has typically French sound, with nasal woodwinds, weak brass and light strings. The Pittsburgh Symphony, on the other hand, has a more robust Germanic sound, with solid strings, strong brass and rich woodwinds.

The *Symphony No. 2* of Brahms receives a beautiful performance from Steinberg, although it would benefit from a more flowing interpretation. Sound is the highpoint here, and the transparency and immediacy of the reproduction is quite extraordinary. This close pickup results in some rather strident high strings but the over-all effect is quietly sensational. Dervaux offers a very fine performance of *Alborada del Gracioso*, but *La Valse* is turgid, and *Daphnis* is just too much for this orchestra. As it isn't mentioned on the label, it comes as a surprise to hear a chorus at the end of the *Daphnis*. For this recording, COMMAND utilized a rather distant pickup for the orchestra, and there is surprisingly little spectacle. All in all, this tape is a disappointment both in performance and sound.

If COMMAND wants to go all out in the classical field, why not record Leopold

Stokowski with a pick-up orchestra in some of his remarkable specialties; for example, Stokowski's arrangement of *Pictures at an Exhibition*, with COMMAND's best sound, would be a stunner.



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

CANTELOUBE: Songs of the Auvergne
Netania Davrath, soprano; Orchestra conducted by Pierre de la Roche
VANGUARD
4-track, 7½ ips
\$7.95...47 min.

Joseph Canteloube's settings of selected folk songs of the Auvergne region of France have long been a favorite with record collectors since the time of the early Columbia recording by Madeleine Grey on 78's, years ago. The songs selected are primarily love songs, mostly of a rather sad nature, and there are a few rollicking Bourrées to offset the generally serene nature of the collection. Now we have not only all of the songs previously available, but many others, all recorded with gorgeous sound, performed by Netania Davrath, an Israeli soprano, who displays consummate artistry and whose pure soprano is just right for these incredibly beautiful songs. The orchestra isn't identified, but it plays wonderfully, with the many important woodwind solos managed with ultimate finesse.

Since receiving this tape I've played it more than any other tape I have. It is a positive *must* in any tape collection, and is guaranteed to provide lasting satisfaction.



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

RESPIGHI: The Birds and Brazilian Impressions
London Symphony Orchestra conducted by Antal Dorati
MERCURY ST 90153
4-track, 7½ ips
\$7.95...39 min.

This is the finest tape I have ever heard from Mercury, despite occasional slight low-frequency cross-talk. *The Birds* is a five-movement orchestral suite derived from English and French composers. The *Prelude* is followed by musical descriptions of the dove, the hen, the nightingale and the Cuckoo, with a brief reprise of the *Prelude* at the conclusion. The three movements

of *Brazilian Impressions* are entitled *Tropical Night*, *Butantan* and *Song and Dance*, and were written as the result of a trip Respighi made to Brazil in 1927. Both of these suites abound in orchestral color, although they do not require the vast orchestral resources of the same composer's three best-known symphonic poems, *The Pines of Rome*, the *Fountains of Rome* and *Roman Festivals*, and as a result there are no big, shattering sonic displays. What there is, however, is the finest reproduction I've ever heard from Mercury, with smooth, silky highs and deep, satisfying bass. There is slight occasional low-frequency cross-talk, but not to the point of distraction. The tape is stunningly packaged—the color photograph on the tape box is extraordinarily effective. Let's hope we'll have more tapes like this from Mercury.



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

BARTOK: Concerto for Orchestra, Dance Suite
Amsterdam Concertgebouw Orchestra conducted by Bernard Haitink
EPIC EC 814
4-track, 7½ ips
\$7.95...53 min.

This performance of the *Concerto for Orchestra* is superlative, with the new young co-conductor of the Concertgebouw Orchestra in his most effective idiom. Reproduction is of the best Epic has achieved with the Concertgebouw, and, with the addition of a robust reading of the *Dance Suite*, this tape is unqualifiedly a best buy.

Although the Hollreiser version on Vox 704 was a highly commendable enterprise, now for the same price one has a better performance, with the added bonus of the *Dance Suite*. The Ansermet-Suisse Romande version on London K 80068, \$11.95 (coupled with the same composer's *Music for Strings, Percussion and Celeste*) simply isn't in the same class.

OTHER CLASSICAL TAPES IN BRIEF

From Mercury comes a new tape release of the Philharmonia Hungarica Orchestra conducted by Antal Dorati performing music of Bartok—the *Dance Suite*, *Two Portraits*, Op. 5, and two excerpts from *Mikrokosmos* (ST 90183, \$7.95, playing time 34 min.). The close-up recording isn't very flattering to the sound of this orchestra, and the new Epic tape of the *Dance Suite* reviewed herein, which also includes the *Concerto for Orchestra*, is a much better buy in all respects. From Victor there's a collection of more or less familiar piano works of Chopin played by

Van Cliburn, featuring the *Polonaise in A Flat*, *Fantaisie in F Minor*, *Scherzo No. 3* and other shorter works (RCA FTC 2091, \$8.95, playing time 52 min.). Performances are rather pedestrian, and piano sound somewhat emphasizes the bass, but the tape is good value in playing time. Victor has also released a third "electronic stereo reprocessing" of an older recording by Arturo Toscanini with the NBC Symphony Orchestra—Respighi's *Fountains of Rome* and *Pines of Rome* (FTC 2083, \$8.95, playing time 36 minutes). As in the previous two releases of music of Dvorak and Moussorgsky, high frequencies are distorted and stereo effect confused. Another Mercury release entitled "Bouquet de Paray" features Paul Paray conducting the Detroit Symphony Orchestra in familiar warhorses—Rossini's *William Tell Overture*, *Danse Macabre* by Saint-Saens, Weber's *Invitation to the Dance*, and Liszt's *Mephisto Waltz* (ST 90203, \$7.95, playing time 38 min.). Performances are adept, but reproduction exaggerates the bass, and there's a lack of the natural resonance of a good concert hall.

SEMI-CLASSICAL



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

CLASSICS BY CHACKSFIELD

Side 1: Claire De Lune, Minuet in G, The Swan, Salut D'Amour, Valse De Fleurs, Liebestraum
 Side 2: Melody in F, Morning Song, Humoresque, Air on a String
 Frank Chacksfield and His Orchestra
 RICHMOND (London) RPE 45025
 4-track, 7 1/2 ips
 \$4.95 .41 mins.

Frank Chacksfield has compiled a group of classical selections that provide a program of beautiful melodies. "Claire de Lune," "Melody in F," "Waltz of the Flowers" and "Liebestraum" are examples of time-honored favorites which never lose their appeal.

He features the high strings in a way that is typically his own. These numbers, while recorded at a lower than average level, nevertheless provide a welcome relief from the pop and percussion so prevalent today. This tape is recommended for those who ordinarily do not care for classical music. Stereo effect is well defined.—*F. N. West.*

SHOWS



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

CARNIVAL

Opening-Direct From Vienna, Mira, Sword,

Rose and Cape, A Very Nice Man, I've Got to Find A Reason, Yes, My Heart, Humming, Theme From Carnival, Grand Imperial Cirque De Paris, Her Face, Yum, Ticky, Ticky, Tum, Tum, The Rich, Beautiful Candy, Everybody Like You, I Hate Him, Her Face, It Was Always You, She's My Love, Theme From Carnival

Original Broadway Cast
 MGM STC-3946
 4-track, 7 1/2 ips
 \$7.95...43 mins.

Like most original cast recordings, this tape will have the greatest interest for those who have seen the Broadway production and know what it is all about.

For the uninformed, Carnival is a love story about a charming country girl who discovers love in a little French carnival. Based on the cinema production of "Lili," it stars Anna Maria Albergheggi and a large cast of performers who do exceedingly well by the Bob Merrill score.

Good voices, delightful love songs, a touch of humor and human interest throughout. Broad stereo effect and excellent recording give it a theatrical quality that reflects the life and love of this magic world of show business.—*F. N. West.*



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

CARNIVAL

Side 1: Opening-Direct From Vienna, Very Nice Man, I've Got To Find A Reason, Mira, The Sword, The Rose, and the Cape, Yes, My Heart
 Side 2: Golden Delicious, Yum, Ticky, Ticky, Tum, Tum, The Rich, Beautiful Candy, Her Face, It Was Always You, She's My Love and Finale
 Ornadel and The Starlight Symphony Orchestra
 MGM STC-3945
 4-track, 7 1/2 ips
 \$7.95...34 mins.

If you prefer the instrumental version of the score from Carnival, you will thrill to the music of the Starlight Symphony Orchestra conducted by Cyril Ornadel.

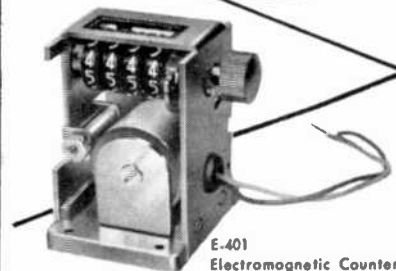
This is an exceptional, melodic, symphonic rendition that does much to enhance and establish the fine musical properties that are not as pretentiously presented in the original cast version.

Ornadel's treatment of the music from "Carnival" is just as enjoyable as his recent album of "Camelot," (reviewed here December 1961). Sound quality is first rate.—*F. N. West.*



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

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CARNIVAL AND OTHER GREAT BROADWAY HITS

Side 1: Theme From Carnival, I Feel Pretty, You Are Beautiful, Shall We Dance, Till There Was You, I Know About Love
 Side 2: Do-Re-Mi, Till Tomorrow, So In Love, Ascot Gavotte, If Ever I Would Leave You, My Heart is So Full of You
 Mantovani and His Orchestra
 LONDON LPM 70047
 4-track, 7 1/2 ips
 \$6.95... 35-45 mins.

The title of this album is somewhat misleading, for only the "Theme From Carnival" is included. The other numbers are selected from eleven more award win-

ning musical shows spanning the period from 1948 through 1961. Mantovani has imparted to all of them his distinctive arrangements, and, with his skill in capturing even the most subtle nuances of the highest string passages, created a thing of infinite charm and appeal.

London's superb sound makes for enjoyable listening.—*F. N. West.*



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

STEREO ACTION GOES BROADWAY

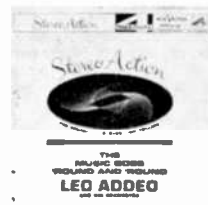
Sequence A: Heat Wave, Seventy-Six Trombones, Keep-A-Hoppin', Bali Ha'i, It's Legitimate, Slaughter on Tenth Avenue
Sequence B: Hernando's Hideaway, I Got Rhythm, Camelot, Show Me, The Sound of Music, El Sombrero
Dick Shory's Percussion and Brass Ensemble
RCA FTP-1087
4-track, 7½ ips
\$7.95 ... 35:30 mins.



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

STEREO ACTION GOES HOLLYWOOD

Sequence A: Around the World, The Children's Marching Song, Song of the Barefoot Contessa, Song From "Moulin Rouge," The 3rd Man Theme, Gigi
Sequence B: Colonel Bogey, Moonglow and Theme From "Picnic," The High and the Mighty, Tara's Theme, Baby, It's Cold Outside, Invitation
Marty Gold and His Orchestra
RCA FTP-1088
4-track, 7½ ips
\$7.95 ... 32 mins.



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

THE MUSIC GOES 'ROUND AND 'ROUND

Sequence A: The Music Goes 'Round and 'Round, Dancing Tambourine, Let's Take a Walk Around the Block, The Doll Dance, Don't Fence Me In, Stumbling
Sequence B: Love Is Just Around the Corner, Then I'll Be Happy, Would You Like to Take a Walk, Elmer's Tune, I Found a Million Dollar Baby, You'd Be Surprised
Leo Addeo and His Orchestra
RCA FTP 1076
4-track, 7½ ips
\$7.95 ... 30 mins.

To quote the descriptive folder with these tapes—"Stereo Action is a revolu-

tionary new concept of stereo recording in which instruments, singers, whole sections, and even full orchestras are placed into movement so that the listener has, literally, music his eyes can follow."

All of this results in a new listening experience as RCA engineers create novel, amusing and interesting electronic effects while Dick Schory performs the musical acrobatics on a brace of Broadway show tunes. His arrangements take full advantage of the moving sound medium and the introduction of sound effects in the musical selections makes a lively and realistic program.

In "Stereo Action Goes Hollywood," Marty Gold gives a new dimension to a group of movie sound track themes that readily lend themselves to stereo in motion arrangements. "Around the World," "Third Man Theme," "Gigi," and "Tara's Theme" are among the familiar numbers that certainly sound different here.

In "Music Goes 'Round and 'Round," Leo Addeo adapts Stereo Action to a group of old standbys such as the title song, "Doll Dance," "Elmer's Tune" and "Then I'll Be Happy." He features the harmonica, accordion and ocarinas with his orchestra.

All three tapes are well played, beautifully recorded, with, of course, tremendous stereo effect.

To the audiophile, Stereo Action is not disturbing or confusing—it is something novel and stimulating—a phase in the ever growing process of stereo reproduction of sound. These tapes will provide a good test of your stereo system.—*F. N. West.*

POPULAR



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

THE SHAPE OF SOUNDS TO COME

Side 1: I've Got You Under My Skin, I've Heard That Song Before, All the Things You Are, Theme From "The Ingrates," More Than You Know, Tony's Wife, Get Out of Town
Side 2: Ain't Misbehavin', You Stepped Out of a Dream, Jackie's Tune, Rain on the Roof, Arkansas Holler
Larry Elgart and His Orchestra
MGM STC 3896
4-track, 7½ ips
\$7.95 ... 32 mins.

Larry Elgart's concept of the "Shape of Sounds to Come" is to use electronics to achieve realism and true musical sound uncluttered by dazzling effects. With this in mind, he, assisted by his wife and his regular staff of arrangers, has combined talents to bring new life and verve into some of our standard all-time favorites, such as "I've Got You Under My Skin," "Ain't Misbehavin'," "More Than You Know" and others. That they achieved their goal can be ascertained with the

playing of the first number. The Elgart sound is unique and stereo effect is well defined, but not extreme. One small complaint, however, the second side of this tape has only five numbers, leaving about five minutes of blank tape that could have been filled out with a few more selections.—*F. N. West.*



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

CONTINENTAL HOST

Side 1: Under Paris Skies, La Vie En Rose, The poor People of Paris, Mam'selle, The Maxixe, Darling Je Vous Aime Beaucoup
Side 2: Arrivederci Roma, Fascination, Mattinata, Anna, Come Back To Sorrento, Funiculi Funicula
Raoul Meynard and Orchestra
WARNER BROS. WSTC 1424
4-track, 7½ ips
\$7.95 ... 32:40 mins.

Raoul Meynard creates a mood of soft candlelight, good wine and sweet music in this tape which features the favorite melodies of the French Riviera on one side and the Italian Riviera on the other.

He uses a typical continental cafe orchestra, in which the strings, of the plucked variety, predominate in catchy rhythms which we all know so well.

The recording is faultless, with exceptionally clean and crisp sound that is free of any recording noise or tape hiss.

This is good music for dining, dancing or just listening.—*F. N. West.*



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

BONANZA

Side 1: Journey of the Hopefuls, Hoss, Annie O'Toole, Gypsy, Ponderosa, Bonanza, Hoe-Down
Side 2: The Balloon Riders, Legend of Sam Hill, Silent Thunder, Horseless Carriage, Fury in Old Mexico
David Rose and His Concert Orchestra
MGM STC 3960
4-track, 7½ ips
\$7.95 ... 33 mins.

Even if you aren't a habitual TV watcher of the Bonanza series, you will appreciate the concert orchestra's rendition of these beautiful themes. All but one of these was composed and orchestrated by David Rose. While some of them were written for short scenes, he has now fully developed them so that they comprise a series of musical vignettes. The moods and themes are varied, and the result is good stereo listening. The music is certainly a grade above the average TV musical score heard today, and it is all done in the best David Rose style.—*F. N. West.*

"WHY MY RECORDER IS IMPORTANT TO ME" CONTEST

WIN A REEL OF TAPE. Tell us in your own words why your recorder is important to you, not why it could be important to someone else. Entries will be judged on the basis of their usefulness to others and on the uniqueness of the recorder use. No entries will be returned. Address your entry to: Important Recorder Contest, Tape Recording Magazine, Severna Park, Md.

Dear Editor:

My recorder is important to me because I am in the United States Air Force.

Before the service I had about five tape pals all over the land but for some reason I let the taping to them fade away. When I joined the Air Force I was at a large base for over a year and of course there were a million things to do all the time.

But now I am one of the lucky ones to be assigned to a detachment away from a base; it's important work, but it gives you more spare time to fill. I am not the type that can find fun in doing nothing so I decided to start taping again. I read in your "feedback" column one day about Tom Bradford that wanted to help people get started. I wrote to Tom and he sent me a letter with names of people interested in gaining new friends too. Now I have happy evenings again taping with people all over the land. I think now I will keep at it because I know how much it means to me NOW!

I really need my tape recorder (your magazine too!!) to take up some of my spare time and it sure is fun in other ways but this is my main reason. Well that's why my recorder is important to me. — *A2C Richard Dewese, Douglas, Wyoming.*

Gentlemen:

A great deal of time, in the insurance business, is spent in counseling with clients about the distribution of life insurance estates, after the death of the wage-earner. Hidden away in my files are several "Letters to My Wife" written by different clients, to be handed to the family, only after death. Since I've had my tape recorder, these Letters to the Family have been put on tape.

Can you possibly imagine the emotions of a recently bereaved family, when they sit down in a quiet room and hear the voice of husband and father saying "My Darlings, always remember how much I love you . . ." and then, of course, "Our dreams can still come true. . . ."

My tape recorder, to me, is a way to make new friends, its a lot of fun, and a way of "armchair travelling" through tape letters around the world. But when it can ease the rocky path for families, to provide a guiding voice of love, along with the steak, shingles and shoes which an adequate insurance estate provides, then my tape recorder really becomes an important part of my daily life!—*Mazie Coffman, Indianapolis, Indiana.*

Gentlemen:

My tape recorder is important to me as a professional harpist. I play for weddings, for important religious services, and other private or public functions.

Often I cannot locate a harp arrangement of a piece of music I desire to use. So I write off a suitable version from a piano, organ or violin score. I even have written down the music of a folksong which I have heard, and for which no printed score exists. This is not difficult for one who has had the training necessary for piano or harp composition.

Often I devise a supplementary part for a violinist, and sometimes for a cello or clarinet, so that I can present a group with music otherwise unobtainable.

After the arrangements are all on paper, I play them to my Ampex recorder, and then listen to the playback. As I listen I think of changes and discover errors. If I have an accompanist, he also can be coached with the aid of playbacks. This enables me to obtain unique and superior results.

I also record children's tunes for my two children to sing with. They like to sing with mamma's harp, but mamma is not always able to sit down and accompany them. At any time I can record any tune desired on the tape, and I can set the tempo, key, and harmony as I wish. Then with a little oversight, they can play the piece over and over as much as they wish. I can even record their childish singing and send it to a couple of dotting grandparents who live far away and also have a tape recorder!

We have about 150 reels of tape of music which we have loved and recorded ourselves, from various sources: live, radio, phono, and TV. — *Mildred J. Harris, Gloverville, N. Y.*

Gentlemen:

Here are two unusual ways I have used my record.

One is as an aid while developing film in the darkroom. I made a tape with spoken timing signals each 15 seconds. With the tape playing, I do not have to depend upon a timer or clock. Background music makes the time pass more enjoyably also.

Another use is to make verbal notes while working on any type of equipment that requires being put back together as it came apart. Just describe what you did step by step and if your memory fails, the tape will not.—*Carl Bonzo, Jr., Portsmouth, Ohio.*



RECORD & PLAY WHILE AWAY...

WITH
terado POWER
CONVERTERS
PROVIDE HOME ELECTRICITY
FROM THE STORAGE BATTERY

Now you can record or play your tapes anywhere . . . in car, boat or plane. Terado Converters change the 6 or 12 volt battery current to 110 volt, 60 cycle A.C., making your recorder and other electronic equipment truly portable. Models from 35 to 300 watts, all filtered for radios and tape recorders. List prices start at \$23.95.

See Your Electronics Parts Dealer, or Write:

terado COMPANY
1063 RAYMOND AVE.
ST. PAUL 8, MINNESOTA
In Canada: ATLAS RADIO CORPORATION LTD., Toronto

Gentlemen:

My tape recorder is important to me because being 65 years of age, wife deceased, children married and relocated in New Jersey, Utah, and California, it has become my most helpful companion at home to record, for future pleasure, opera, old and new songs from radio and T/V.

In addition, the tape recorder has become a patient secretary, making recordings of sales presentations I work up. On the playback, when I act the part of a prospect, shows whether it is OK or faulty. If the latter, corrections are easily made. This help has been worth more to me than what the recorder cost.

When friends visit, the tape recorder hidden, records the latest gossip, which is supposed to be confidential. When I replay the recording, the expression shown on their faces—words cannot express. A bit of fun for me. Erase the recording before their eyes to put them at ease. A lesson for these friends—not nice to talk or criticize others until they screen themselves first.

Had been taking language lessons, via short wave radio from Voice of Germany, and Radio Moscow, when reception was good. Making recordings of my lessons and my pronunciations of words in these lessons, on replay showed up my errors which I would not have noticed without my patient recorder.—*William J. Lennartz, Beacon, N. Y.*

CROSSTALK

from the Editors

SOME COMMENTS BY two representatives of the British tape recording industry, as reported in the trade press, might well engender some thoughts on this side of the ocean.

* * * * *

FOR ONE THING, they stated that England has the highest per capita ownership of tape recorders in the world, with West Germany in second place. They felt that this was odd considering the fact that the United States buying power was so much greater.

* * * * *

WORTHY OF NOTE is the fact that sales of tape recorders in England last year were some 250,000 machines in a population of 50,000,000. The United States, with a population of 180,000,000 was nowhere near the more than three times that figure that might reasonably be expected.

* * * * *

AS WE HAVE NOTED in these columns before, the British are far ahead of us in the use of tape recorders as a hobby. Overseas they have a goodly number of tape clubs that meet in face-to-face fashion, rather than by correspondence. They produce dramatic and other shows and the use of the recorder for vacation recording, sound collecting and the like is far ahead.

* * * * *

THE TWO GENTLEMEN, Harry Lubin, president, and Thomas Thomas, V.P. in charge of sales for Elizabethan Tape Recorders, Ltd. felt that the market for tape recorders in the United States was unlimited and that the surface has hardly been scratched.

* * * * *

THEY ALSO STATED that the U. S. market appears to be about four years behind the British market in the matter of education of the public in matters of tape recording.

* * * * *

THE ENGLISH apparently have taken a different tack on tape recorder sales, also. The most popular type of British machine is a straight 3 1/2 ips model which sells for about \$60. It has no frills and no gimmicks and its main feature is that it is uncomplicated and can be operated by anyone. This has made it a home entertainment instrument.

* * * * *

STEREO SEEMS NOT to have caught on overseas and, consequently, neither has four track. One reason is that the stereo units cost about five times as much as the monophonic and about three times the cost of a three speed mono recorder.

* * * * *

WE DO NOT KNOW why the U.S.A., long the leader in numbers of bathtubs, telephones, automobiles and a thousand other things has fallen so short in the matter of tape recorders. In this promotion-minded nation it may simply be a lack of the kind of promotion that reaches people and convinces them that tape recording is fun. Perhaps so versatile an instrument as the recorder has been detrimentally tied to music reproduction, which demonstrates only a small part of its capability. Industry people might well give some quiet thought to these problems.

* * * * *

WE ARE HAPPY to see one of the large firms, Webcor, in conjunction with Warner Bros. and The Richards Music Co., embarking on a contest of national dimensions with 18,000 prizes worth some \$162,000. The contest is restricted to youngsters from 8 to 18 who can make a free contest recording at any participating dealer's store of himself playing any recognized musical instrument. The recordings will be entered in national competition, with prizes to the winners and also to the winner's schools.

* * * * *

ACTIVITIES SUCH AS this contest are good, not only for the sponsors, but for the entire industry. We wish Webcor well with their contest and we hope the idea catches on.

INDUSTRY NEWS

AUDIO DEVICES has named Herman Kornbrodt to the post of vice president and General Sales Manager by William T. Hack, president. Bryce Haynes becomes a member of the board of directors and will devote his time to developing new markets and sales planning. Mr. Kornbrodt has also served as secretary of the Magnetic Recording Industry Association since its founding.

ALLIED IMPEX, importer of the Miranda camera line has entered the tape recorder field with a two speed portable. The unit operates at $3\frac{3}{4}$ and $1\frac{7}{8}$ ips and uses four dry cell D batteries for power.

EASTMAN KODAK has entered the consumer tape market with "Kodak" Sound Recording Tape. Just a few months ago they introduced their "Eastman" tape for professional use. According to Eastman president William S. Vaughn, the tape will be marketed through photographic channels and with Kodak's 12,000 dealers will make the tape readily available anywhere. The company states that there is little difference in making photographic film and tape insofar as the maintenance of close tolerances, cleanliness, uniformity and inspection are concerned and that the Kodak line of tapes will reflect their fine quality control.

The tapes will be available on 3", 5" and 7" reels on a triacetate base material which, the company states, will be good for 1000 years. It will be spooled on one-piece reels which contain a molded-in splicing block on both sides. The tape will be available in $1\frac{1}{2}$ and 1 mil thicknesses.

Kodak's French affiliate Kodak-Pathé has been making magnetic tape since 1945 and its experience in the field was drawn upon by the Rochester factory.

"MADMAN" MUNTZ of TV fame is going into the manufacture of tape cartridge units for automobiles which may also be used in the home. The units will be unveiled in mid March in the Los Angeles area. Plans call for introduction then in Texas and Florida. The players measure 8 inches square by $3\frac{1}{2}$ inches high and are completely transistorized. Tape speed will be $3\frac{3}{4}$ ips, four track. The units are being manufactured by Viking for Muntz.

MINNESOTA MINING reports a record year in their annual report. The Magnetic Products Division continued to show gains on all fronts and shortly will open a stereo tape duplication center at the Hutchinson plant to turn out the new cartridges, marketing plans for which are to be announced this month. An iron oxide manufacturing unit will be in operation this year at Hastings, Minn.

BELL SOUND has filled four posts. William W. Westfall has been named manager of marketing services, Russell Mock succeeds Andrew Lorant as advertising manager, Herbert Mayer was named Bel Canto tape sales manager, succeeding Pete Fabri and Al Baumeister has been appointed new product manager.

RCA has created a new department; Educational Services. Harold Metz will head up the new division which will provide

a variety of services in all fields of education, formal education, industrial and government education, and home study. The new division incorporates the long established RCA Institutes which is made up of technical schools in Los Angeles and New York. A tape-slide "Auto-Guide" will be used in some of the courses.

WORLD'S FAIR OF MUSIC AND SOUND will be held in Chicago, August 31 to September 9, according to Aaron D. Cushman, fair president. It will embrace all segments of the music and sound industry and will be both a dealer and consumer show. It will be held at McCormick Place.

SOUND CORPORATION OF AMERICA, Silver Spring, Maryland has been formed to manufacture and distribute a line of continuous magnetic tape cartridges, recording and playback equipment. Richard P. Ellison will head the firm. The offices are at 9162 Brookville Road.

SHERWOOD ELECTRONICS, Chicago, is offering \$1000 reward for information leading to the arrest and conviction of thieves who broke into the I.L.&C. terminal and stole 97 pieces of Sherwood merchandise. It was valued at \$14,000 and consisted of FM receivers and tuners, amplifiers and FM stereo multiplex adapters. General Manager Edward S. Miller cautions dealers and distributors to be on their guard for any Sherwood units offered them at unusually low prices or sold by unauthorized individuals. The serial numbers are on record.

MUSICTAPES, INC. is the name of a new firm set up by Peter Fabri, formerly director of marketing and sales for Bel Canto. The firm has exclusive agreements with United Artists, Vee Jay and Starday. The tapes will be marketed through record, phonograph and electronic distributors according to present plans.

AUDIO-VISUAL COUNCIL ON PUBLIC INFORMATION, 1201 Spring Street, Fairfax, Va. has issued a booklet "Has It Made Any Difference" which covers the use of audio visual materials in churches. Single copies are 25 cents each with lower prices on quantities for dealers who might want to distribute them to church customers.

TELEPROMPTER CORPORATION, originators of mechanical TV prompters has purchased Weathers Industries, makers of hi-fi products. The firm will develop and market an expanded line of audio-visual products including large screen TV and slide projection equipment.

WEBCOR, INC. has developed a new recorder for the Federal Aviation Agency which will monitor 22 simultaneous conversations on a single tape. The unit is designed to help solve a critical air traffic control problem. The vastly increased sound storage capacity will cut in half the storage space formerly needed and even the recorders themselves take but two-thirds the space of four channel units now used by the agency. The tape speed is 15/16 inch per second.

REVERE CAMERA COMPANY will

market its Wollensak tape recorder line direct to dealers through its own sales force instead of the eight distributors it formerly used, according to J. C. Landen, Revere's director of marketing. The switch will not take effect until August 1962.

AMERICAN CONCERTONE DIVISION of Astro-Science Corporation has announced the appointment of Albert C. Sofe as chief engineer of audio products. He has been associated with magnetic recording for 13 years.

PITTSBURGH CORNING CORPORATION, 1 Gateway Center, Pittsburgh 22, Pa. has issued a booklet "Geocoustic" describing their cellular glass sound absorbing materials. The booklet should be of interest to those who are concerned with studio design for recording purposes.

ORR ENTERPRISES, Opelika, Alabama, has announced that Russ Molloy, former president of Bel Canto, has joined the firm as Marketing Manager for the Orrtronics Division which manufactures the modular tape player. He will direct the sales of both the player and the music in cartridge form for it.

AMPEX CORPORATION has realigned its nationwide field organization by appointing seven new regional managers. All company products, including memory devices for instrumentation, computer, video and audio use, and magnetic tape will be handled by the regional managers. Previously, district managers were responsible for individual product lines.

ROBERTS STEREO TAPE RECORDERS



LAWRENCE WELK:
"My Roberts 1040 tape recorder is the closest to recording studio equipment that I have seen."

ONLY THE ROBERTS 1040 4-TRACK STEREOPHONIC TAPE RECORDER Combines these Advanced Features:

Unique "listen-to-yourself" feature • Records new FM MULTIPLEX STEREO CASTS • 4-track stereo and monaural record/play • 2-track stereo and monaural play • Sound-with-sound, using either track as basic track • Dual, self contained power stereo amplifiers • Dual, built-in extended range stereo speakers • Automatic shut-off. **\$299.50**

ROBERTS ELECTRONICS, INC. Dept. TR-4-L
5920 Bowcroft Ave., Los Angeles 16, Calif.
Please send me:

Roberts Stereo Tape Instruction Manual containing stereo and monaural applications. I enclose 25¢ (cash, stamps) for postage and handling.

The name of my nearest dealer.

Name _____

Address _____

City _____ Zone _____ State _____

LETTERS

Excerpts from readers' letters, including questions and answers, will be used in this column.

Address all correspondence to: The Editor: TAPE RECORDING, Severna Park, Maryland

Matching

To the Editor:

From reading the "Questions and Answers" section of your magazine it is quite apparent that much confusion and misunderstanding exists regarding the subject of impedance mismatching.

The prevailing misconception seems to be that when connecting a signal from a program source of a given output impedance to a tape recorder with a much different input impedance, that this so-called "impedance mismatch" will somehow cause distortion or some other deterioration of quality. Such is not the case, as will be seen.

The important thing to keep in mind when connecting a given program source, such as an FM tuner, TV set, or microphone, to the input of a tape recorder, is the concept of "low level" and "high level" signal voltages. A "low level" source is considered to be signal voltages in the order of 5 to 20 millivolts. Microphones and magnetic phono cartridges are low level sources. A "high level" source is one with output signal voltage in the vicinity of .5 to 1 volt. Examples of typical high level sources are FM tuners, TV sets, and crystal or ceramic phono cartridges. Most tape recorders will have input provisions for both low and high level signal sources. These inputs can be in the form of two separate jacks, one for low level and the other for high level. The low level jack is usually marked "microphone" and the high level jack may be marked "radio-phonograph" or similar designation. Other recorders may utilize only one input jack but will provide for high and low level inputs by choice of two different plug configurations.

It is extremely important to use the appropriate input on the recorder to suit the signal level of the program source. For example, if a high level source is connected to the recorder low level input, the pre-amp in the record amplifier will be overloaded causing serious distortion in the recording. Conversely, should a low level source be connected to the recorder high level input, it will not result in distortion but rather in an extremely weak recording. Therefore, the important consideration is that of matching program source signal voltages with correct recorder input and it is *not* a matter of matching impedances. It is also important at this time to emphasize that high level outputs can exist from either a very low impedance source or from high impedance source. Likewise, a low level output can exist from either low or high impedance sources. Therefore, there is no particular relationship between signal level and impedance.

Consider the following condition: It is desired to record from a TV set by connecting directly across the voice coil speaker terminals. With the TV volume turned up to a comfortable listening level, a high

level signal source exists. Since the speaker impedance is around 4 to 8 ohms this would be an extremely low source impedance. However, we would now connect this to the high level input of the recorder which may have an input impedance as high as 1 megohm. This obviously constitutes a very large degree of impedance mismatch but there is no reason why this would cause any distortion providing we remember to connect to high level recorder input. If we had made a mistake and connected to the microphone input, considerable distortion would have resulted from voltage overloading at low-level input *but not because of impedance mismatch.*

The only time impedance matching becomes important is in applications involving the transfer of power such as matching a speaker of proper impedance to a power amplifier. A mis-match in this instance could result in increased distortion and loss of power output.

Referring to the question and answer section in February, 1962 issue of "Tape Recording," the answer to the first question again confuses the issue by use of the term impedance mismatch, implying that this is the cause of the trouble and not just input voltage overloading. Furthermore, as a remedy for this "impedance mismatch," it was suggested that a transformer with an 8 ohm primary and 100,000 ohm secondary be connected with the low side to the phonograph speaker and the high side to the recorder. One must remember that a transformer, in addition to being an impedance transforming device, is at the same time a voltage transformer. With the particular transformer recommended and the suggested method of connection, the phono speaker signal voltage would be stepped up roughly 100 times! This means that certainly over 100 volts would be fed to the recorder input obviously overloading the pre-amp into intolerable distortion. This case is an excellent example of the disastrous results when attempting an impedance match while at the same time completely overlooking the signal voltage levels involved.

I hope this letter will serve its intended purpose to clarify this subject so that by understanding these basic techniques, satisfactory results can be obtained by all in the home recording field.—David C. Menzel, Homewood, Illinois.

Eliminating Pops

To the Editor:

I just discovered that there is another way to use the mike input to gain volume from the TV and still retain the listening volume at normal level. This was derived from your suggestion of using a resistor in the circuit. Well, I know that a pot is a resistor and most pots are of the 100K ohm variety, and so I asked myself why

couldn't I use my little Switchcraft mixer. I tried this and it works. By placing the TV at normal listening volume and plugging the voice coil tap cable into the mixer and then from the output of the mixer into the mike input of the recorder and adjusting the recording level and then advancing the pot to about 1/3 of its capacity—in other words actually reducing the pot resistance, one can get a very clear recording volume by this method. Perhaps the transistorized mixer is better for this but I was going by the least expensive route. I imagine that there are other mixers of like caliber (I know Olson Radio has one for about \$6.95). But I still maintain that for a truer tone, it is best to channel through a preamp and use the phono input. Of course, there are some recorders that have only one input jack like the Webcor (but has two circuits functioning through a three contact jack).

Now, in response to the question of E.O.S. of Muscatine, Iowa in the October issue (I save my back issues) you suggested the use of a mixer to avoid the pops in the recording when switching from mike to phone or when stopping and starting later. May I suggest a much simpler method which will work on nearly all tape recorders. As you know the "pop" is the result of the activation of a switch and that switch is the record switch. The record switch is the safety lock button which is pushed to record before the tape is set in motion. If further recording is to be done and a smooth track is wanted, then when stopping the machine, make sure that your finger stays depressed on the record button when shutting the machine motion off—this will keep the record circuit engaged. This will work with nearly all machines except those that have piano type keys with a separate record and play key. It takes some skill to do this, but with practice it becomes second nature. This works beautifully with the Ampex. With the Webcor the record button has a slide action to it to keep it locked into place. By experimenting one can determine the best method by which this can be accomplished.

Now, may I ask another question? Do you have a simple suggestion for starting a tape recorder with narration and an 8mm film so that they will jibe? I don't mean to get into fine clap board and lip sync. A slide show is cued (manually or automatically), but is there a simple way to start the tape and film running at the same time. Should one make a brief "speech" at the beginning of the tape, with the notation to play the tape first?—Rexford F. Mortimer, Altus, Okla.

Punch a hole in the film leader just prior to the first frame. Put a mark on the tape at some point. Line up the film in the projector with the hole in the gate and line up the mark on the tape with a point on the record. Start both machines at the same time, or as near to it as you can come. Throughout the film you should have "check points" such as changes of scenes, etc. which should occur at specific spots on the tape. Slow or speed the projector between check points to keep it in step. Lip synch is practically impossible without having the soundtrack on the film.

NEW PRODUCTS

WIRELESS MICROPHONE SYSTEM



The new Victoreen wireless microphone system Model 421D is based on the patented Victoreen method of operating crystal-controlled oscillators at high frequencies and directly frequency-modulating them. Transmitter weighs only 10 oz. including mercury batteries good for 30 hours' continuous use, and it requires only short, soft antenna wire easily carried in clothing. Omni-directional high quality dynamic dynamic button-mike leaves user's hands completely free. According to the manufacturer, reception on the system receiver is sharp, clear, high fidelity, without mike noises or interference. Model 421 has F.C.C. type acceptance for licensed use in specific commercial applications; also is certified under Part 15 of F.C.C. rules for operation without a license. Another unit, Model 421A, has F.C.C. Type Acceptance for use on public safety frequencies and operates within the new, narrow-band regulations. Write for complete specifications on Mike-Caster System 421 to Federal Manufacturing & Engineering Corp., a division of Victoreen Instrument Co., 1055 Stewart Avenue, Garden City, New York.

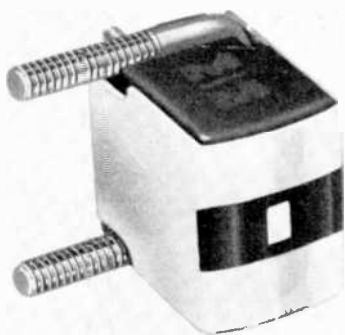
TAPE-ATHON TAPE PLAYER



A unique tape player for background music presentation has been announced by Tape-Athon Corp., 523 South Hindry, Inglewood, California. This new player operates at a speed of 2 ips, which was the

speed selected on the basis of the best response at a speed allowing the most music on a single tape. According to the manufacturer, the most "comfortable" listening range for continuous background music is in the area of 50 to 6000 cycles. The 2 ips speed was chosen since it satisfied the response requirements, and also allowed 16 hours of music to be packaged into a single 10" tape reel. This new player is available in 1 7/8, 3 3/4 and 7 1/2 ips as well as the 2 ips version. For all details, contact Tape-Athon.

MICHIGAN MAGNETICS HEAD



Michigan Magnetics, Inc., Vermontville, Michigan, has introduced the 7H17 half track monaural tape recording head, which the manufacturer claims is based on performance-proven principles, and because of exceptional production and quality controls, will offer unusual fidelity and reliability. In addition, 100% functional flush-face shielding makes tape starting easier, while contributing toward still greater reliability. For complete technical information about the new 7H17 monaural head, write Michigan Magnetics, Inc., above address.

RECORDER CARE KIT



The latest tape recorder care product from Robins Industries Corp. is the TK-6, a kit containing a two-ounce bottle of head cleaner

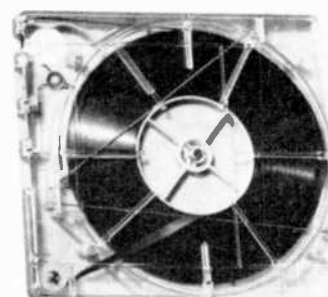
with applicator and a two-ounce bottle and applicator of lubricant for the recording head and tape guides of a recorder. This kit is priced at \$2.00. Cleaner and lubricant are also sold individually at \$1.00 each. Write to Robins Industries Corp., 15-58-127th Street, Flushing 56, N. Y., for information on this and their other tape recorder accessories.

COSMOPOLITAN RECORDER



A new portable tape recorder has been introduced by American Concertone. It is designated as the Model 400 Cosmopolitan, a recorder-radio combination. The power source for this machine can be either four 1.5V flashlight batteries or external AC. Its speeds are 1 7/8 and 3 3/4 ips. Fully transistorized, the complement includes 12 transistors plus diodes and rectifier. The Cosmopolitan's head complement consists of two heads, the record-playback unit and the erase head. Other features include arbitrary counter, dual meter to monitor audio level and instantly show the condition of the batteries, plus the use of 5 inch reels. The Cosmopolitan can be carried on the shoulder strap provided for in-field interviews, laid on the seat of a car or airplane for dictating while driving or flying, or used in an infinite number of ways in the office or at home. For free information, write American Concertone, 94-49 West Jefferson Blvd., Culver City, Calif.

FIDELIPAC CARTRIDGE



The Fidelipac cartridge, manufactured by Conley Electronics Corp., 1527 Lyons Street, Evanston, Illinois, is a continuous self-contained single reel tape magazine. It is available in three sizes: Model 300 has up to 300 feet of tape; Model 600 has up to 600 feet and Model 1200 has up to 1200 feet. Complete information and prices available from Conley.

TAPE CLUB NEWS

Tape Triangle

The American Tape Exchange club urges its members to use an arrangement whereby three people tapespond with one reel of tape. The first person records track one, the second person track two. The third person listens to both tracks, then records on track one in place of the first person's message and then sends the tape on to him. From here on, each person receiving the tape will hear messages from the other two tapespondents. Remember, to make room for your message on the tape triangle, always erase the voice of the person to whom you are sending the tape by putting your voice on instead.

The ATE Director, Cortlandt Parent, Jr., is on one tape triangle with tape pals in Willowdale, Ontario, and Calgary, Alberta, and he reports that it has worked out very well.

WTP Readers for the Blind

The WTE services for the blind, directed by Bob Brunson, also WTE director, recently helped set up a plan whereby the World Tape Pals Club of Bayless Elementary School, of Syosset, New York, will assist the director of the Children's Department of the Library for the Blind in New York City, and also Miss Georgia Caldwell, teacher of blind children in Oklahoma City, Okla.

WTE services for the blind is specialized. Mr. Brunson points out, in that it aims only to furnish readers for blind students and professional people. He emphasizes that not everyone can, or is willing, to read lengthy and technical textbooks needed by students, especially those in college; and a good backlog of willing readers is especially needed by this group.

Neither reader nor student need be a member of World Tape Pals, says Mr. Brunson, in order to participate in this.

Club Tutors

The Union Mondiale Des Voix Francaises club has started a new activity. It is called "Service de Tutelage Franco-American." This service will enable American members to improve their French pronunciation through tape exchange with voluntary "tutors" in France and Belgium.

This service is free for club members. Only a 25c "tutelage-coupon" has to be sent with each tape in order to cover the mailing expenses of the French "tutors."

This is one of the most worthwhile services we have heard of in any club and the club is to be congratulated on its inception.

Voicespondents Meet

Just recently, two girls from Wallingford-on-Thames, Berkshire, England, arrived at Logan International Airport in Boston, Mass. where they were welcomed into the U.S. by Mr. Paul Harlow. They were Miss Mary Butler and Miss Margaret Merchant, both members of the Voicespondence Club. Paul, also a member of the club, has been voicesponding with Mary for a little over a year.

JOIN A CLUB

TAPE RECORDING Magazine assumes no responsibility for the management or operation of the clubs listed. This directory of clubs is maintained as a service to our readers. Please write directly to the club in which you are interested regarding membership or other matters.

AMATEUR TAPE EXCHANGE ASSOCIATION
Ernest Rawlings, President
5411 Bocage Street
Cartierville, Montreal 9, P. Q., Canada

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

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

CLUB DU RUBAN SONORE
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TAPE RECORDING CLUB
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129 South Broad Street
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116-06 139th Street
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Emile Garin, Secretary
886 Bushwick Avenue
Brooklyn 21, N. Y.

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

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Box 970. H., G.P.O. Adelaide, South Australia

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123 Sutton Common Rd.
Sutton, Surrey, England

THE BRITISH AMATEUR TAPE RECORDING SOCIETY
Ted Yates, Secretary
210, Stamford Road
Blacon, Chester, Cheshire, England

THE NEW ZEALAND TAPE RECORDING CLUB
Kenneth M. Tuxford
P. O. Box 7060
Auckland, W. I., New Zealand

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

While in the United States, Mary and Margaret visited Mr. & Mrs. R. Shea, and Mr. & Mrs. D. Reid of Beverly, Mass. Paul introduced them to some new friends also.

After leaving Mass. they visited John Hohman in Baltimore, Mazie Coffman in Indianapolis, Indiana, as well as a host of other people in Indianapolis. They visited other friends in Ohio and then returned to Mass. before leaving for the return trip to England.

The girls were most impressed by the New England area as well as Indianapolis, and they, together with a third partner, Margaret Clark, would like to sell the record and coffee shop business they have in Wallingford and move to the U.S.

Educational Club Planned

John C. Bobbitt of Tennessee is forming an educational tape club for the purpose of serving those persons whose primary interest in a tape club is for educational purposes. This club will enable them to withdraw tapes from lists without the usual social formalities.

The basic plan is that each prospective member will make a reel of tape concerning his unusual experiences, hobby or subject in which he has a special knowledge. These tapes will state the contributor's name, subject title of the tape, then an instructional, narrative type lecture.

Members will pay initial dues and contribute at least one tape. Members may withdraw tapes for playing and return. These tapes will also be loaned to educational, civic and other groups for playing.

Persons interested should write, enclosing a self-addressed and stamped envelope to John C. Bobbitt, director, Educational Tape Club of America, P.O. Box 7596, Memphis, Tennessee.

Cartridge Correspondence Club

Another new club is in the process of organization also. This is one formed for RCA and Bell cartridge machine owners.

At this time there is no cost to join this club and there are no dues as yet. The purposes of this club will be to create new friends, get more and better use from a tape recorder, become better talkers as well as obtaining the courage to speak before a group of people, and to exchange information on civic affairs and items of interest in your community.

Anyone interested in joining this newly formed club may contact Duane Davidson, RR-12 Box 172, Lafayette, Indiana.

Letter From India

We have received a letter forwarded on to us from Radio & Electronics magazine, in which the writer states that he is in a position to send recorded tapes of Indian music—classical, instrumental or vocal—to any place in the world. He also has sound snaps of Indian marriage and religious ceremonies, Indian villages, Indian streets and ways of Indian cooking.

The writer's name is Ambika Shrivastava, and he is a sound engineer whose address is 30, Pagnis Paga, Indore City (M.P.), India. Mr. Shrivastava has also organized a sort of tape-friendship club in India. Any interested parties may contact him at the above address.

TAPE IN EDUCATION

Robert C. Snyder

It is not unusual for a teacher to assign some television viewing to a class when there is a program on the air which fits in with the lesson plan. Due to the prevalence of TV sets in American homes this is a rather safe procedure and those without TV sets can generally visit with someone who has one in order to see the assigned program.

The day may not be too far off when the ownership of home tape recorders may make a similar assignment possible in relation to the home study of foreign languages or similar "audio" work.

For this purpose, the small, three inch reels might be used with which the student could practice at home on his own recorder.

This would be especially beneficial if the recorder was of the Add A Track type which permits playing one track while recording on the other. This was pioneered in home recorders by the V-M Corporation who have trademarked the term.

The small reels could be handed out to the class and turned back in the next day with the completed work on them. The teacher could then spot check for errors which might be in need of correction.

In addition to the practice of homework on recorded reels, students might also be required, from time to time, to tape something from radio or TV that fitted into the lesson material. An address by a famous person, a dramatic program covering some phase of history, a discussion program covering current events or the actual event, such as spaceship launching are topics which readily come to mind.

With a multitude of "tapers" on the job, the school should rather rapidly be able to gather together a worthwhile library of taped material that, with some editing and cataloging, would be a very valuable adjunct to the book library.

In the case of the recording of actual events and speeches, this material would increase in value as the years passed. The study of history could be made to come alive when the actual voices and sounds of an event in the historical past could be heard.

The teaching of appreciation for English literature would be another subject that would come alive through the medium of tape. The reading of stories or plays by people skilled in the vocal arts would make a far more lasting impression than classroom attempts at the same thing.

With recorders in the homes, the tapes could be borrowed from the school library for home use and study, just as regular books are used today.

Though we are strong advocates of tape as a teaching medium, we are the first to recognize that in some learning situations other media can do a better job. Tape is not the substitute for everything.

However, there are fields in which tape has the most to offer and the greatest progress can be made by putting the most emphasis on those fields.

The language laboratory with its battery

of tape recorders has been acknowledged the best way of teaching the spoken foreign language. There is simply no other media than can compete with it, not only in the matter of being able to record in imitation of native speakers but in being able to make corrections as necessary.

There is a need for more research in the effectiveness of teaching with tape and both the government and some of the foundations might pay more attention to this than they have been. For instance, little or nothing has been done to establish the frequencies needed to teach foreign languages. Some of the sibilants require a high frequency response and must be present to make the language sound natural. How high are they? How good must recorders be for language labs?—We need to know.

Some first glimmerings are also in evidence as to the importance of voice tone as it pertains to the various languages. Some tongues are consistently spoken at a lower or higher pitch than others and this has an important bearing on the naturalness of the speech. More research is needed here also.

We cannot conclude this column without a pat on the back to the National Audio Visual Association for their "Audio Visual Equipment Directory, Eighth Edition." This is a complete guide to current models of A-V equipment and it covers the whole field in a most complete manner.

Included in its 332 pages are specifications and pictures on: 16 mm Optical Sound Projectors, 16 mm Magnetic Sound Projectors, 15 mm Repetitive Projectors, 8 mm Sound Projectors, Filmstrip and Slide Projectors, Opaque and Overhead Projectors, Special Purpose Projection Equipment, Micro-projectors, Automatic Continuous Still Projectors, Sound Slidefilm Projectors, Record and Transcription Players, Tape Recorders and Playbacks, Repetitive Tape Equipment, Language Laboratory Systems, Projection Screens, Projector Tables and Stands, Reading and Tachiscope Devices, Instructional Television, Classroom Radios, Teaching Machines, Misc. Equipment, and in the Appendices such useful information as Trade Names, Where to Buy It, Lamp Tables, Screen Size Charts, Tape Speeds, etc.

Compiled by James W. Hulfish, Jr. of NAVA together with Associate Editor Laurie Shirey, this 8½ x 11 volume belongs on the desk of every A-V director whether in school or industry. It is truly a magnificent example of what a directory should be.

The volume is intended for use of NAVA members, who pay for its publication, and for A-V consumers in churches, schools, etc. It is underpriced at \$5.00 a copy.

Orders for the book may be sent to the National Audio Visual Association, 1201 Spring Street, Fairfax, Virginia and the order should be on the letterhead of the person ordering it.

TAPE RECORDING IN EUROPE

Some of the most interesting developments in tape recording are taking place in old-established factories and laboratories in Europe. The fullest information about them appears regularly in **TAPE Recording Magazine**, published in London, England, since February 1957.

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TAPESPONDENTS WANTED

This listing is for those seeking tape correspondents, looking for swaps of tapes, etc. and it is a free service for our readers. If you wish your name listed send us the following information on a post card: 1-Name, 2-Mailing Address, 3-Kind of recorder, speed and number of tracks, 4-Subjects on which you want to tapespond or items for which you are looking, 5-Indicate whether you are an adult or teenager. Listing will run two months and then be dropped to make way for new listings. Address your postcard to: TAPESPONDENTS WANTED, Tape Recording Magazine, 101 Baltimore-Annapolis Blvd., Severna Park, Md.

- Howard W. McClelland, 90. Bryant Avenue, White Plains, N. Y.; Recorder: Wollensak T-1500, 3 3/4 & 7 1/2 ips, dual track; Interests: Military Band Music; Adult.
- William R. Piletic, 5050 Broadway, Chicago 40, Illinois; Recorder: V-M Tape-O-Matic 710A, 3 3/4 and 7 1/2 ips, dual track; Interests: Acting, Theatre, Philosophy, Creative Writing; Adult, age 24.
- J. R. Quisenberry, 4725 E. 52nd Pl., Maywood, California; Recorders: Ampex 350-2, 7 1/2 & 15 ips, full track, half track, dual track stereo; Interests: wish to exchange music of the 20's, unusual recordings of prominent people, adult humor, etc.; Adult.
- E. J. Ellison, Box 171, Summerland, California; Recorder: Ampex, 3 3/4 ips, stereo; Interest: wishes to correspond with fellow tape enthusiasts, especially those interested in exchanging color slides (which would be returned) using the tape as a dialogue explaining the slides, also is a collector of jazz recordings, many of which are old and unobtainable; Adult (38).
- Jay Albrecht, 69 8th Ave., N.Y.C. 14; Recorders: Bell, 3 3/4 & 7 1/2 ips, Fi-Cord, 1 1/8 & 7 1/2 ips, both dual track; Interests: Wish tapespondence on poetry, U. S. foreign policy, European common market—from Americans and from Europeans in West and East; Adult (35), writer, single, speak Danish, English.
- Heins Brueggemann, 94 Mountview Avenue, Toronto 9, Ontario, Canada; Recorder: Grundig TK-45, 1 1/8, 3 3/4, & 7 1/2 ips, four tracks (stereo); Interests: About anything, music, operas, classics, pops, movies, etc.; Adult (30).
- Arthur W. Brand, 999 W. Berry Dr., Littleton, Colorado; Recorder: Grundig TK-60, 3 3/4 & 7 1/2 ips, two track; Interests: interested in doing tape recording for the blind, would like to exchange musical tapes, am interested in meeting people of foreign lands by tape and just general chit-chat with anyone interested; Adult (42), married, 3 children.
- LCDR John W. Beale, USN, Navy, #537 (Box 8), c/o FPO New York, N. Y.; Recorder: Norelco "400," 1 1/8, 3 3/4 & 7 1/2 ips, four track; Interest: Folk music; Adult.
- Evang. Ivan H. Smith, Box #4, West End Station, Colorado Springs, Colo.; Recorders: Webcor, 7 1/2 & 3 3/4 ips, dual track and Bell, 7 1/2 & 3 3/4 ips, dual track; Interests: Bible study, hymns, sermons, camp meetings, church services, preferably from single young people between 20 and 30; Adult (29), single.
- John T. Rowlinson, 17 Monadnock Street, Boston, Dorchester, Mass.; Recorder: Wollensak 1500, 3 3/4 & 7 1/2 ips; Interest: Ed Sullivan's Irish program 3/17/61 taped from television at the time (mostly music); Adult.
- Russell E. Safcin, 120 Cartier St., Ottawa 4, Ontario, Canada; Recorder: V-M, 7 1/2 & 3 3/4 ips, 4 track; Interests: Would like to swap tapes on Austrian singing and yodeling, and to correspond with people interested in mysticism; Adult.
- Ronald Brandys, 808 N. Patterson Pk. Ave., Baltimore 5, Maryland; Recorder: Telectro SA121, 7 1/2 or 3 3/4 ips, dual track; Interests: Different types of modern music and sound effects, or any teenage tape correspondents from foreign countries (English speaking); Teenager (18).
- Mr. & Mrs. Robert C. Dare, 8041 Monroe Ave., Munster, Indiana; Recorder: Revere T-2200, 7 1/2 & 3 3/4 ips, 4 track; Interests: Antiques, art, general interests, music, organ, photography, recording, records, travel, hi-fi; Adults.
- F. L. Reynolds, 2539—38th Ave., San Francisco 16, Calif.; Recorders: Norelco "400," 1 1/8, 3 3/4, 7 1/2 ips, 4 track, and Concord "401," 3 3/4 & 7 1/2 ips, 4 track; Interests: Classical and popular music, unusual sound effects; Adult (54).
- James R. Betancourt, 141 E. Summit St., Harbor Springs, Michigan; Recorder: Norelco #400, 7 1/2 ips, 4 track; Interest: Wanted—someone in Northern Michigan to exchange and copy stereo tapes with; Adult.
- Miss G. De Marco, P. O. Box 251, Bronxville, New York; Recorder: Norelco "400," 1 1/8, 3 3/4 & 7 1/2 ips, 4 track; Interest: Tapes of the Literature of Modern Ireland course given on T. V.; Adult.
- Randy Johnson, 200 Thomas Avenue South, Minneapolis 5, Minn.; Recorders: Sony 101, 3 3/4 and 7 1/2 ips, dual and Viking "85," 3 3/4 & 7 1/2 ips, 4 track stereo; Interests: Electronics, music, new tape clubs, recording sound effects, hi-fi, just about everything, cars, stamps, records, also want a tape pal in Mendoza, Argentina; Teenager (15).
- George F. Stamm, 451 Lindea Ave., Aurora, Illinois; Recorder: Concertone, 3 3/4 & 7 1/2 ips, 2 and 4 track; Interest: Exchange music tapes, classical, semi and popular; Adult (64).
- Lance D. Kyed, 70 Congress Avenue, Shelton, Conn.; Recorder: Webcor, 3 3/4 or 7 1/2 ips, dual track monaural; Interests: Letters, music, records, comedy, etc.; Teenager (15).
- Sheldon Schoenberg, 1800 Davidson Avenue, Bronx 53, N. Y.; Recorder: Wollensak, 3 3/4 and 7 1/2 ips, 4 track; Interests: Popular, show and classical music. Interested in trading 4 track stereo tapes; Teenager.
- Joseph Besko, 65-41 165th Street, Flushing 65, N. Y.; Recorders: Ampex 960 & 1270, 7 1/2 ips, 2 & 4 track and VM722, 2 & 4 track and staggered two track; Interest: I would like a tape copying exchange friendship on stereo popular, semi-classical and classical tapes. If you can't copy for yourself I can; Adult.
- Wayne A. Sauer, 26933 Elizabeth Lane, Olmsted Falls 38, Ohio; Recorder: Knight stereo play and record, 1 1/8, 3 3/4 and 7 1/2 ips; Interests: Travel, sports, bowling, golf, baseball, football, cooking, music, general conversation; Adult—tapespond as a family also, daughter 12 years old.
- J. Malcolm Ross, 360 West 55 St., New York 19, N. Y.; Recorder: Sony SL 262, 7 1/2 & 3 3/4 ips, 4 track stereo; Interests: Metropolitan Opera broadcast, Sat., Jan. 20th, 1962. I need Lawrence Tibbett biography portion only. May I copy your tape please? Glad to defray postage and reciprocate. Name your interest; Adult.
- Dr. C. F. Engelhardt, 200 So. Jefferson St., Princeton, Ky.; Recorder: Ampro, 7 1/2 and 3 3/4 ips, 2 track; Interest: Gardening, specialty—roses. Have large collection of talks made at American Rose Society convention. Anything pertaining to the growing of flowers; Adult.
- Neil Dame, 4332 Palmer Ave., Jacksonville 10, Florida; Recorder: Ampex 960, 3 3/4 and 7 1/2 ips, 2 and 4 track; Interests: Music, television and radio, outer space, and tape recording; Adult (29).
- H. R. Gallant, 3913 Castro Valley Blvd., Castro Valley 90, Calif.; Recorder: Ampex 970, 7 1/2 & 3 3/4 ips, 2 and 4 track; Interest: Overseas, anything of interest; Adult.
- Martin Phillips, 1450 S. 52nd Street, Phila. 43, Pa.; Recorder: Norelco 400, 4 track stereo; Interests: Jewish folk music and songs, foreign folk music and songs (German, Russian, Spanish, Italian, English, Norwegian, etc.); Adult.
- Barbara Bobbitt, age 12, Susan Bobbitt, age 10, 2442 Rodney, Houston 34, Texas; Recorder: Webcor, 3 3/4 ips, dual track; this listing approved by the respondents' father.
- William Dusel, 11907 Maple Ave., Blue Island, Illinois; Recorder: V-M, 7 1/2 & 3 3/4 ips, 4 track and dual track, stereo playback; Interests: happy living, humorous stories, army memories, idea exchange, good food, music, drama,

speeches, slides, writing, English & German; Engineer, Adult.

John C. Bobbitt, P. O. Box 7596, Memphis, Tenn.; Recorder: Webcor, 3 3/4 ips, dual track; Adult.

Edward P. Yersh, 1982 De Biencourt St., Montreal 20, Quebec, Canada; Recorder: Revere, 7 1/2 & 3 3/4 ips, dual track; Interests: General Topics; Married, over 21.

Eugene Steinberg, P. O. Box 87, Rugby Station, Brooklyn 3, New York; Recorder: V-M 720, 7 1/2 & 3 3/4 ips, quarter track (dual track and full track play); Interests: Audio, electronics, flying saucers, high fidelity, hypnotism, classical, popular, and semi-classical music, color—still and slide photography, science-fiction, stereo tapes, sound effects and equipment; Teenager.

Alexander J. Baranyi, 104 Earl Lane, Hatboro, Pa.; Recorder: Concertone, 7 1/2 & 3 3/4 ips, 4 track; Interests: Music and general; Adult.

John Markel, 1235—24th St. N. E., Canton, Ohio; Recorders: Webcor, 7 1/2 & 3 3/4 ips, two track, and V-M, Model 720, 7 1/2 & 3 3/4 ips, 4 track; Interests: Alcoholism and photography; Adult.

John H. Ross, 5217 N. Winthrop St., Chicago 40, Illinois; Recorder: Wollensak, 7 1/2 & 3 3/4 ips, dual track; Interests: Folk Music, Country and Western music, Southern Gospel music; Adult (30).

James Martin, 33 North Western Highway, Blauvelt, N. Y.; Recorder: Norelco, 4 track, 3 speed; Interests: Educational controversy, all subjects on controversy, in science, education, teaching, etc., world affairs, etc.; Adult, college teacher, secondary, education.

Sixth Grade Class, Jr. Dept., c/o Donald R. Shue, Teacher, 2nd EJB Church, Queen & South Sts., York, Pa.; Recorder: V-M, 3 3/4 & 7 1/2 ips, dual track, monaural; Interests: Will talk about anything that is of interest to 10-11 year olds; Teacher is Adult.

Herman Bargy, 11116-1/4 Camarillo Street, North Hollywood, Calif.; Recorder: Wollensak, 4 track, 3 3/4 and 7 1/2 ips; Interests: Wish to exchange tapes on the subjects of adult comedy, satire, and unusual material; Adult.

Duane Davidson, Pres., RR #12, Box 172, Lafayette, Indiana; Recorders: RCA or Bell cartridge; Interests: Trying to start a tape club for cartridge recorder owners, known as International Cartridge Tape Corresponding Pals, general interest subjects and stereo music; Adults.

Lester Slama, 2351 Wilson Ave., Chicago 25, Illinois; Recorder: Webcor, 3 3/4 & 7 1/2 ips; Interests: Printing, publishing, interesting topics, sound effects, stock market information; Adult.

Miss Verda Branner, 215 Louvaine Dr., Kenmore 23, New York; Recorder: Norelco, 1 1/8, 3 3/4 & 7 1/2 ips, dual track; Interests: Religion, recorders, diabetes, general topics; Adult.

Ian Purves, 552 Huron St., Toronto 5, Ontario, Canada; Recorder: V-M, 7 1/2 or 3 3/4 ips, dual track; Interests: Country blues, folk music; Adult (24).

Steve Buggie, 2421 Garfield Ave., South, Minneapolis 5, Minn.; Recorder: Norelco Continental 400, 1 1/8, 3 3/4 & 7 1/2 ips, 4 track, stereo, monaural; Interests: Hi-fi, stereo, audio, science-fiction, good music, sound effects; Teenager (15).

Sammy Amsler, 802 Elk Ave., Midland, Texas; Recorder: Wollensak T-1500, 7 1/2 & 3 3/4 ips; Interests: Information from owners of Wollensak T-1700, Stuzzi Magnet and Concertone TR100 Transcorder portable tape recorders, developments in Videotape for home TV, electronic data processing—primarily accountants who are studying or working in E.D.P. applications, hearing from anyone who has traveled to Europe on a moderate budget, hearing from those who have had experience in portable tape recording; Adult (31), single.

Ronald Schadegg, 58 Liberty Street-Apt. 6, San Francisco, Calif.; Recorder: Revere, 7 1/2 or 3 3/4 ips, dual track; Interests: Movies, musicals, coin collecting, antiques, tape recording in general, foreign lands.

William E. Welch, 312 Manton Avenue, Providence 9, Rhode Island; Recorders: Wollensak 2 track and Revere 2 & 4 track, 7 1/2 ips; Interests: Wanted—Early Ted Heath Orchestra (1945 to 1950, preferably broadcasts), any material by following bands (live or commercial issues): Ken Mackintosh, Squadronaires,

Northern Dance Orch., Harry South Orch., Kenny Baker. I have 4000 discs (78's, LP's and ET's) of American swing bands which I will swap (on tape) for above items. Also, I have 60 reels of tapes of American bands (1935 to '55) including broadcasts. I have been collecting since 1940; Adult (37).

Thomas D. Crumpler, 1602 Holladay Street, Portsmouth, Va.; Recorder: Ampex 960, 7 1/2 or 3 3/4 ips, 2 and 4 track; Interests: Stereo pipe organ with close miking. I have recorded many pipe organ recitals in Virginia and North Carolina; Adult (45).

Hans H. Wurm, 17119 Park Ave., Lansing, Ill.; Recorder: Tandberg, Model 5, 1 1/8, 3 3/4 & 7 1/2 ips; Interests: Exchange of Metropolitan Opera Broadcasts, Looking for good copy of: "Romeo & Juliet," Bjorkling 2/1/47, "Simon Boccanegra," Tibbett 2/16/39; Adult.

John P. Winchell, P. O. Box 408, Court Station, Kalamazoo, Michigan; Recorder: Knight KN-4000 Transport and KP-70 record-playback preamp, 2/4 track monaural or stereo; Interests: I would like to correspond with people from other countries and make new friends through this correspondence. I am just starting into tape recording; I am 23 and would like to correspond with those of any age.

Carl Williams, 152 Clizbe Ave., Amsterdam, N. Y.; Recorders: 3 Revers, 1/2 and 1/4 track, 3 3/4 and 7 1/2 ips; Interests: Would like to exchange with persons having a love for organ music. Will answer all tapes sent; Adult.

Jacquelin Terns, 1936 Venice, Dearborn 8, Mich.; Recorder: Webcor, 7 1/2 or 3 3/4 ips, dual track, monaural; Interests: Can I help anyone, Exchange of ideas with any English speaking persons of any country; Adult.

Russ Bothie, 4119 N. Pittsburgh Ave., Chicago 31, Illinois; Recorder: Ampex 970, 2 or 4 track and/or Webcor 2150, 2 or 4 track, both 7 1/2 or 3 3/4 ips; Interests: Wanted—Ballet, musical comedy, or long hair tapes. Comment on audio problems; Adult, professional musician and audio engineer.

R. L. Hawks, 814 N. Main St., Wichita 3, Kansas; Recorder: Bell, 3 3/4 or 7 1/2 ips, 2 or 4 track; Interests: Poetry and organ music such as Moon River, Ted Malone, Carl Zomar, etc. My collection available, no charge.

Gus DeRidder, 34 Winton Lane, Dolgeville, New York; Recorder: Magnecord 728, 7 1/2 ips, monaural, d-al track; Interests: Pre-war big swing band broadcasts & air checks; Adult.

Craig Umberham, 18706 East Chapman Avenue, El Modeno, California; Recorder: Wollensak, 7 1/2 or 3 3/4 ips, dual track; Interests: learning about electronics, records and recording. Wishes to correspond with someone about 17, 18, or up, boy or girl. Loves music—all kinds; Teenager (18).

Robert Simonton, c/o Nat'l. Theatres & Television, 9570 Wilshire Blvd., Beverly Hills, Calif.; Recorder: Recordio, stereo, 7 1/2 or 3 3/4 ips, 2 & 4 track; Interests: Motion pictures, photography, most popular and classical music, want tape respondents male or female, anywhere, any age; Adult (28).

Howard H. Rice, 143 Bernard Drive, Buffalo Grove, Illinois; Recorder: Viking 85 deck and RP-62 record/playback preamp, 7 1/2 and 3 3/4 ips, monaural, half track; Interests: Want to swap tape dubs of classical recordings withdrawn from Schwann LP catalog, classical music from FM delayed "live concert" broadcasts not available on LP records. Monaural only. Prefer 7 1/2 speed; Adult.

R. W. Harmon, 6502 Buena Vista Dr., Vancouver, Washington; Recorder: Norelco "Jazz," 1 1/8, 3 3/4, 7 1/2 ips, 4 track; Interests: Jazz and/or percussion, humorous dialogue; Adult.

Jim Moulder, 3102 Seavers, Dallas, Texas; Recorder: Ampex 960, 3 3/4 & 7 1/2 ips, record—half track mono, 2 track stereo, playback—half track mono, two track stereo, four track stereo; Interests: Old radio programs from 1930's to early 1960's, drama (Lux, etc.), comedy, mystery and such. No music and dance bands, etc.; Adult.

W. Don Curtis, Route 2, Box 280, Denham Springs, Louisiana; Recorders: Roberts 990, 3 3/4 & 7 1/2 ips, quarter track, will also record monaurally, and Sony 262-D tape deck, 7 1/2 & 3 3/4 ips; Interests: Drama, theater, stereo, U. N. Stamps, Photography, travel; Adult (32), single.

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Ed Miles, 2738 Maxwell St., Phila 36, Pa.; Recorder: Telectro, 1 1/8, 3 3/4, 7 1/2 ips, four track, plays stereo; Interests: Coin collecting, Dixieland jazz, ham radio; Adult (31).

Ray Galloway, your musical host, with recording studios located at 714 Stadium Place, on the "Banks of the Beautiful Wabash" in Logansport, Indiana; Recorders: Norelco, 1 1/8, 3 3/4, 7 1/2 ips, Crown Broadcaster, 3 3/4, 7 1/2, 15 ips, dual track, monaural; Interests: Wants music of the swing era, sounds of the great bands recreated in hi-fi, and those who have a collection of Eddy Howard recordings. Desperately need copy of "A Million Dreams Ago," by Eddy Howard. Also would like to contact someone in Palm Springs, Calif and Honolulu; Adult.

Lawrie C. Perera, Apt. 10, 470, Albert Street, Ottawa 4, Ontario, Canada; Recorder: Grundig TK8, dual track, 3 3/4 and 7 1/2 ips; Interests: Jazz small group; Adult.

Malcolm H. Bender, 1234 Donna Dr., Richardson, Texas; Recorder: Sony Stereorecorder, access to others, can cover any standard speed, 2 or 4 track; Interests: Symphonic and March music, semi-classical, high fidelity; Adult.

Earl Linder, acting secretary, Christian Bible Classes, Inc., 2521 N. W. 23 St., Miami, Fla.; Recorders: Norelco, Wollensak, & Webcor, 1 1/8, 3 3/4 and 7 1/2 ips; Interests: harmonizing, true scripture, true science, true history, tapes exchanged.

Lorraine Sele, 4325 W. 104th Street, Inglewood 2, Calif.; Recorders: Viking 75 deck, Heathkit Electronics, 3 3/4 and 7 1/2 ips, dual track; Interests: want tapes of LP's by Edith Piaf (current and catalog deletions); Adult.

Sam Gish, 2411 Jefferson Street, Wilmington 2, Delaware; Recorder: Pentron Astra-Sonic II, monaural record and playback, 3 3/4 and 7 1/2 ips, dual track; Interests: Photography, stamp collecting, model building and music; Teenager (14).

Paul Nagle, 815 Terrace Ave., Dayton, Kentucky; Recorder: Norelco Continental "400," 1 1/8, 3 3/4 & 7 1/2 ips, 4 track; Interests: Exchanging stereo music of big bands. I am also interested in 8mm movies and travel; Adult (31), single.

Wilfrid C. Kennell, 2723 East Shields Avenue, Fresno 3, Calif.; Recorder not listed; Interests: Wants copy of Camera Three broadcast for 2/19/62. Can anyone help?

Jim Moulder, 3102 Seavers, Dallas, Texas; Recorder: Ampex 960, 2 track stereo, 3 3/4 and 7 1/2 ips; Interests: Old radio programs (comedy, drama, mystery, musicals); Adult.



Fig. 1: Don't do it! Don't sell or trade in your old monaural recorder when you buy a new stereo machine. A second recorder, like a second car or TV, has many uses. So, if yours is in good condition, then by all means hang on to it for special-purpose usage.

Don't Trade In Your Old Recorder

by Tommy Thomas

... an outdated recorder is by no means useless—read this before you decide whether or not to discard it.

DON'T TRADE:

THE big thing now, as we all know, is four-track stereo. With the new machines on the market today you can record in stereo (on some), play in stereo (on all) and also record monaurally on each of the four tracks, thus doubling your mono-recording capacity. Add to this the exciting fact that commercial 4-track stereo tapes are on the music markets in abundance, and it's easy to understand why more and more of us have become somewhat dissatisfied with our "old-fashioned" non-stereo machines. If you can afford to switch to stereo, I certainly recommend it . . . but I also want to put in a good word or two in behalf of your "Old Faithful" machine before you sell it or trade it in toward a new recorder.

I definitely suggest *that you keep your old recorder*. There are just too many good uses for a second machine, for you to give it up. This article can't possibly cover all of these uses, but let's give it a try.

In the first place, deserving important consideration, there are all your old tapes to think about. Most of us have a collection of personal tapes made through the years, and these are precious to us and we certainly don't intend to give them up, non-stereo or not. In fact, for many practical purposes of home recording, monaural recording is just as popular as ever. Only now, with a 4-track machine, we can get twice as much on the same tape. And not only that, but if your first machine is an old one (and over five



Fig. 2: Imagine the money saved by using three-fourths of this tape over again. Here is a precious personal collection of monaural, twin-track tapes recorded at 7½ ips. A new recorder can re-record these onto four tracks at 3¾ ips with very little loss in quality, "condensing" everything down to a mere one-fourth in space.

years old is rather old in this fast-progressing field) it's a good bet that a new machine will not only record on twice the number of tracks, but it will also record at $3\frac{3}{4}$ ips *as well or better than your old machine did at $7\frac{1}{2}$ ips*. That means that you can now get **FOUR TIMES** as much recording on the same length of tape. Still further, thinking retroactively, it means that everything you have taped so far at $7\frac{1}{2}$ ips (Fig. 2) can be "condensed" down to just one-fourth the space. It's merely a matter of playing the tapes on your old machine and plugging the output (as shown in Fig. 3) into the new machine for copying. Also, along the way, you can do a bit of judicious editing and volume balancing, to end up with a really excellent collection of nostalgia, fully compatible with 4-track machinery. And then, of course, there's that wonderful Bonus: since you'll be transferring all your old tapes to one-fourth their former space, that means (oh lovely thought) *that three-fourths of the tape will be left remaining, all ready to be used all over again*. How about that.

Therefore, with this in mind and even if I don't quite convince you further along that you should keep your old machine permanently, at least consider making a "deal" when you make your trade-in. Get the dealer to let you keep your old machine for at least an extra week or so, to give you time to make this important copy-transfer of your old tapes to "new."

SPECIAL-PURPOSE USES:

By buying a *converter* for your recorder, you can operate it in your car off the regular 6 or 12-volt car battery. This isn't anything new, of course, but now (with a second recorder) it becomes really practical. Instead of putting the recorder precariously on the seat next to you, you can "build it in" as illustrated in the last November issue of this magazine. A converter is expensive, and building the whole works into your car takes time, so when you've finished you're most likely going to want to leave it there, readily available any time you use your car. With a second recorder, this is no problem!

By buying a *timer clock* for your recorder (Fig. 9), you can put it to good use as a musical alarm clock by your bed . . . or maybe you'd like to experiment with Sleep Learning by having your recorder play through a pillow speaker several times during the night. The big problem here is that using a timer clock with your recorder involves leaving your recorder's rubber pressure capstan constantly against the drive shaft during the night. This, of course, means that soon your capstan will develop "flats" which will make it all but useless for regular recording. Having a second, "expendable" recorder on hand will make this less of a problem. (And naturally, even so, it might be a good idea to have your dealer get you another rubber pressure wheel for when you "go back" to regular recording with this recorder.)

RECORDING FROM TV:

A special fondness of mine is collecting TV music. This is all monaural, of course, so on a seven-inch reel I am able to get (on 1-mil tape, using four tracks at $3\frac{3}{4}$ ips) over six hours of music. I use this music mainly for background effect, "piped" around the house to built-in wall speakers, so the slower speed is plenty ample for these purposes. My main worry here was in the 4-track *editing*. I just wanted the music, and nothing else. My final solu-



Fig. 3, top: To re-record (copy) a tape, plug the output of one recorder into the input of the other. This makes tape editing a simple and pleasurable task. When copying, the new tape can be balanced in volume, deletions can be made where wanted, and various selections can even be "reshuffled."

Fig. 4, middle: If it ever becomes necessary for you to go into the "mass production" of tapes, an extra recorder will cut your work in half. By use of a simple "Y-Connector" cable coupling, it's easy to divide the signal from the record player (or TV, radio, etc.) into the two recorders, so you can make two original tapes simultaneously.

Fig. 5, bottom: Here's a great combination for a special purpose: the collecting of "selected" monaural TV music on 4-track tape. First record the complete TV musical program on your old recorder at $7\frac{1}{2}$ ips, using High Output Tape (for a better signal-to-noise ratio). Then copy only the selections you want to keep onto the 4-track tape.

tion, and it's working out quite well, is to originally record the music on my old machine at $7\frac{1}{2}$ ips . . . and then afterwards to transfer (re-record) the music via my new 4-track machine, at the slower speed and with all the commercials and other non-essentials edited out. That way, I can fill up reel after reel of 4-track tape with "pure" music, and editing is no big problem at all.

Also, in order to squeeze the last bit of quality possible

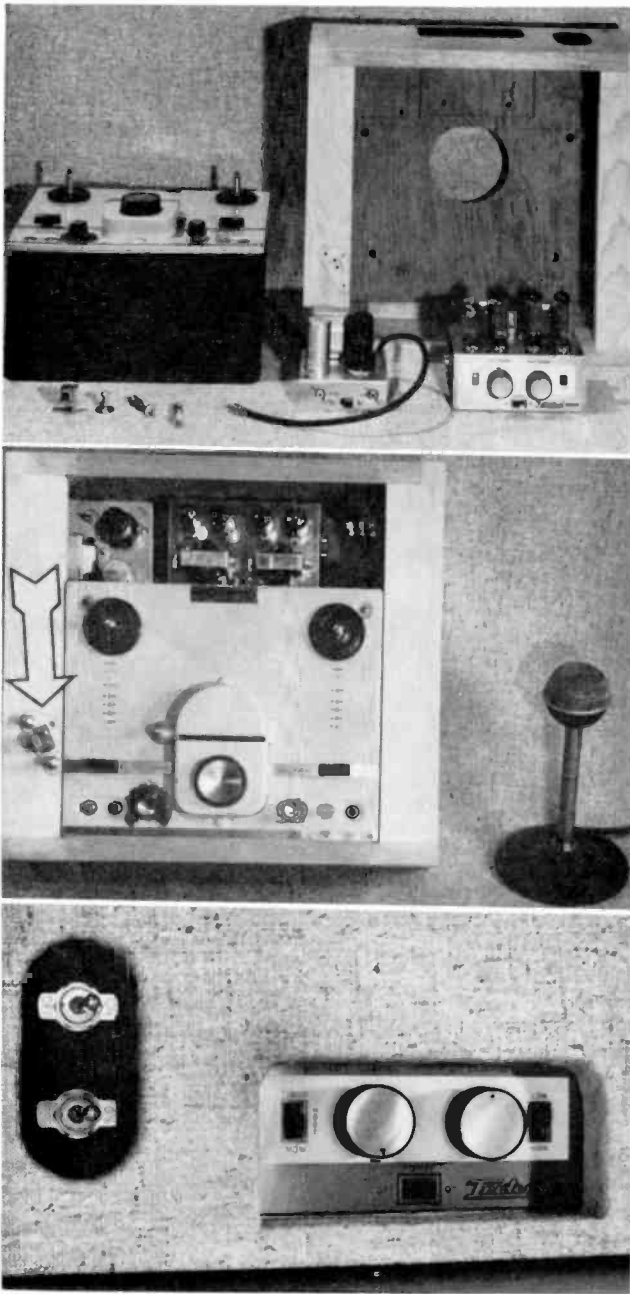


Fig. 6, top: Spruce up your old recorder with a new cabinet. Here, by making the wooden cabinet large enough to also hold an auxiliary preamp and a little power amplifier, a completely self-contained "Echo-Master" unit was the result. Inexpensive upholstery plastic, used as a background here, makes an excellent finish cover.

Fig. 7, middle: Note how compactly the various units fit into the cabinet. It was made just barely large enough to hold everything, yet I was careful to leave plenty of room for ventilation. The arrow points out the "built-in" auxiliary tape-head, guide-post assembly. Perforated peg-board will cover the rear units, neatly and "airily."

Fig. 8, bottom: At the rear of the new cabinet (now covered with the plastic material) two openings allow access to the auxiliary controls. For "Echo Master" recording, toggle switches turn on the extra units, and also switch the recorder's speaker into connection with the little power amp, substituting a "dummy load" resistor in its place.

out of my old timer, I use *High Output Recording Tape* for the original TV recordings. This permits me to record at a higher signal level than normally possible with my old recorder, so I can play it back (re-record it) at a lower level, hence eliminating most of the unwanted background noise and hum. High output tape is a bit expensive com-

pared to regular recording tape, but since I keep using the same reels over and over again for the original TV recordings, this is not really an important consideration. Check with your dealer, though, to make sure you can use this tape to advantage on your particular machine.

A RECORDER FOR YOUR PARENTS:

Something that I can personally recommend quite highly is *Letters On Tape*. Not only with your far-away friends who have tape machines, but with your own folks if they also live far away. So much more can be expressed on tape that it is a most marvelous means of keeping in touch with those you love. Since moving away from my own folks about five years ago, tape recording has performed valiant service in keeping us in almost constant touch with each other. *Warning!* Older people automatically resist "new-fangled" gadgets such as tape recorders, I quickly discovered. With my own mother and father, it took quite a bit of doing, talking them into using a tape machine. Now, though, we exchange tapes on a regular bi-weekly basis and we would feel very lost if we didn't "hear from home" all the time. What we say isn't too important, but hearing each other's voices *is*.

SOUND-ON-SOUND:

By now I believe I've tried all the different systems of producing multiple recordings at home, and I like doing it with two separate recorders best of all. Done this way (Fig. 11) it's an extremely simple matter to make a first recording, and then add subsequent recordings by re-recording from one machine to the other, and at the same time adding the new "addition" via a microphone. And best of all, if you should goof anywhere along the line, it isn't necessary to start *completely* over again, since you won't be erasing the previous recording each time (as we did last month). Also, for those of you who might enjoy experimenting with the "Alvin Effect," it's a simple matter with two recorders, by running each at a different speed. That way, you can combine souped-up "fast talk" with regular-speed talk (and/or singing) for many novel renditions.

By the way, there's another system of sound-on-sound-recording which you might enjoy hearing about. I like to take my recorder down to a bowling alley, to a carnival, to a basketball game or even out in a thunderstorm, etc., and

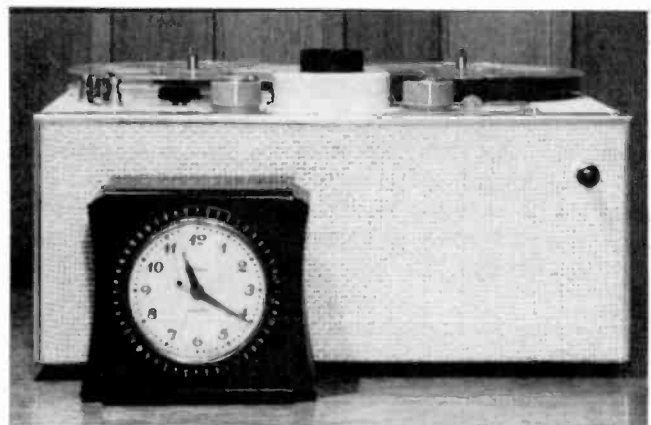


Fig. 9: The completed unit, attractive enough now to fit into any surroundings. By adding auxiliary equipment for special-purpose recordings, here is a machine that doesn't have to "compete" with the new recorders, but has a function uniquely its own. Other equipment, such as this Timer Clock, will extend its special usage still further.



Fig. 10: The "Echo Master" ready for action. Or, if you'd rather have a Stereo Tape Editor instead, then use a similar unit arrangement but with a stereo play head in your auxiliary assembly. And "pipe" both stereo tracks through the recorder's single speaker, which will be plenty adequate for monitoring the tape while editing.

let it record the general "noise" for twenty or thirty minutes. Home again, I catalog these reels and save them for special occasions. Then, any time I want to have some fun with someone I'm sending a tape to, I play one of these background tapes on one recorder (across the room, and set at a low volume so it won't overpower my talking into the mike) and actually do my recording on another recorder. This way, I can pretend that I'm really at a local bowling



Fig. 12: "STEP RIGHT UP, LADIES AND GENTLEMEN, AND RIDE THE FABULOUS GHOST TRAIN." You, too, can be a carnival barker (or anything else) right in your own home in another version of sound-on-sound recording that involves the use of special "background" tapes. Played on a second recorder, they can make you appear to be anywhere you please.

alley, say, making the recording. Though I'm actually at home, my second recorder picks up (from the recorder across the room) all the general *background* sound effects such as balls rolling down the alleys, pins flying, people talking, etc. And I defy anyone to tell that it doesn't sound real. I'm not quite sure what all the possibilities are here, but it's an idea you might enjoy exploring?

"REBUILD" YOUR OLD RECORDER:

This can do much to improve the "prestige" of your old machine. I'm not much on cabinetry myself, wood-working and such, but I discovered a way to disguise this fact. There are so many wonderful new *flexible sheet plastics* on the market today (in dime stores, hardwares and even in yardage departments) that you can make almost any wooden cabinet you put together look pretty handsome by covering it afterwards with this special upholstery-type plastic. It comes by the inexpensive yard, in almost any color and in some very attractive embossed patterns. Then, to finish the job, put a piece of loosely woven and attractive cloth across the front of the cabinet (if that's where the loudspeaker grill is cut out), trim neatly with aluminum molding from the lumber yard, and gadzooks, you've created a minor masterpiece.

Also, you might wish to build your new cabinet large enough to contain *extra equipment*, as shown here. My "Echo Master" system of recording (described last January) turned out to be such a party favorite that I decided to make it all one attractive unit. I built my new cabinet large enough to also hold both the auxiliary preamp needed and a little power amplifier that I happened to have on hand. (It was a stereo-mono job, which I used in its mono setting.) Then, by running the tape around the auxiliary tape playback head that I had included atop the machine (Fig. 10) and using a switching arrangement that enabled me to use the normally silent (during regular recording) recorder's loudspeaker, I had an all-in-one unit. A similar arrangement—but with a *stereo* playback head and with a stereo preamp and power amplifier—could be used to make your second recorder into a very efficient *Tape Editor* for your stereo editing. Editing is hard on a recorder, so this system would do much to save the wear and tear on your good machine.

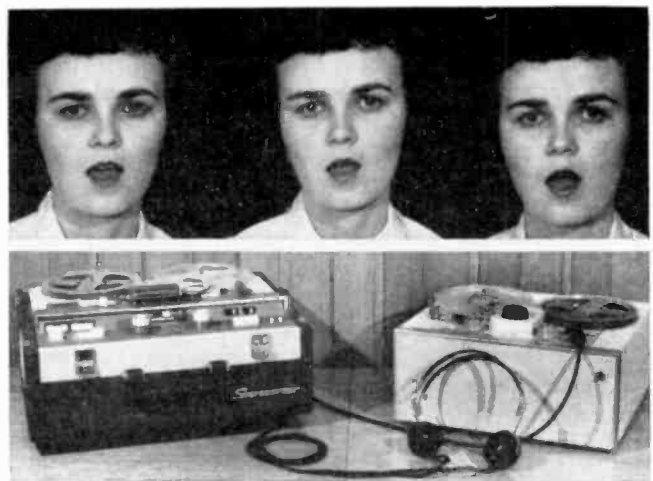
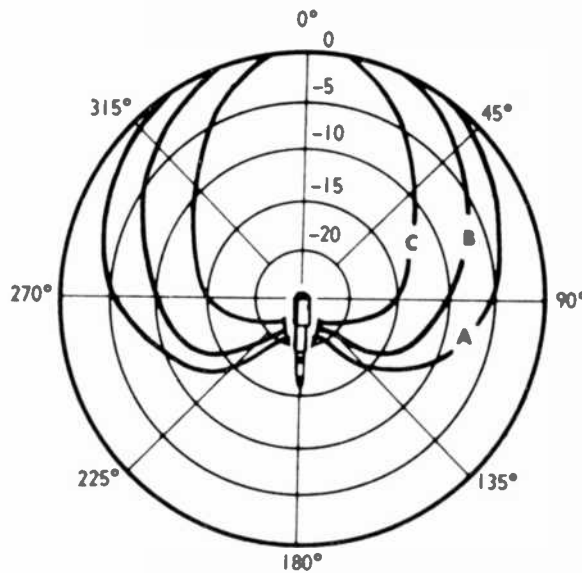
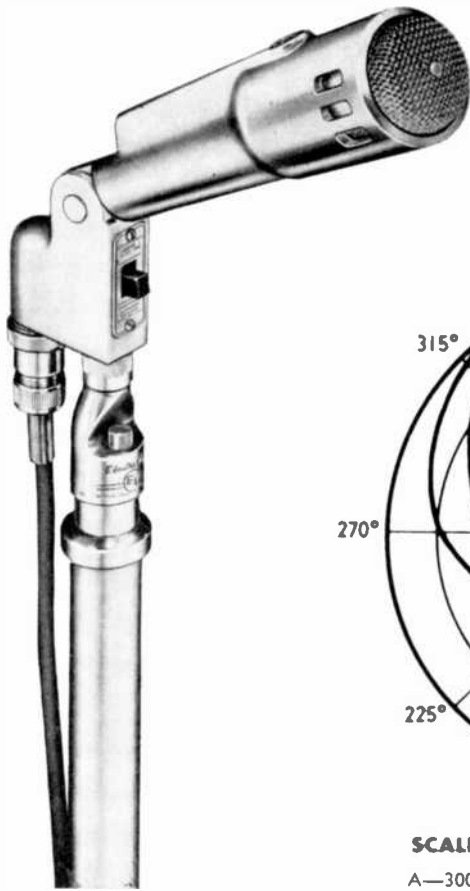


Fig. 11: Sound-on-sound recording is simple with two recorders, and offers variations and effects not easily attainable otherwise. By going back and forth, first recording on one machine and then the other, each time also adding (re-recording) the previous tape while "keeping in time" via headphones, many combinations are possible.

HOW'S

by L. L. Farkas



SCALE: 5 DECIBELS PER DIVISION

A—300 cps B—5,000 cps C—10,000 cps

Electro-Voice Model 664 microphone (cardioid dynamic) and its directivity pattern. A good dynamic microphone will pick up tones to around 15,000 cycles, and it is much less directional than any of the other mikes.

YOU sometimes hear people say: "My tape system is flat across the band; I can really make hi-fi recordings." They generally mean that their tape recorder can pick up tones from 30 to 15,000 cycles per second, that they have an expensive speaker system that reproduces all these frequencies, and that they have a microphone with the same rating. But here is the weak point. They usually don't realize the extent of the frequency discrimination of their microphone, nor of its frequency response in the place where they do most of their recording.

What are some of the characteristics of the best known microphones, and how can you determine those of the one that you are using? A few years ago the most common microphone was the carbon mike. With an air-damped duraluminum diaphragm it has a uniform response from 70 to around 10,000 cycles, with a peak around 7,000 cycles. But its response to high frequencies, as soon as their source moves away from directly in front of the microphone, drops off fairly rapidly, so that at an angle of 90 degrees there is a loss of 9 decibels from 1,000 to 5,000 cycles. However, the greatest fault of the carbon microphone is its high noise level, or microphone hiss, and for that reason it is not recommended for high fidelity usage.

The condenser microphone can be made fairly linear in response by placing the resonant frequency of its diaphragm outside of the audible range, but at this point the microphone is quite insensitive. To counteract this condition, current condenser microphones have their resonant diaphragm frequency set within the audible range. This results in a rise in output below 100 cycles, and in a peak at around 4,000 cycles, but it improves the overall sensitivity of the microphone to practical limits. Below 500 cycles the condenser microphone is practically non-direc-

tive; its directivity increases above 2,000 cycles.

The dynamic microphone is a general purpose unit. It has fairly high sensitivity, and while its frequency response is not quite as good as that of the condenser microphone, a good dynamic microphone will pick up tones to around 15,000 cycles. A grid is usually placed in front of the diaphragm to prevent any resonance above 8,000 cycles. As to directivity, it drops off slightly at the higher frequencies coming from the sides of the microphone, but it is much less directional than any of the other microphones.

The microphone mostly used with tape recorders is the crystal microphone. It has an average response, ranging roughly from 60 to 8,000 cycles, and as indicated on the polar diagram, it is fairly directional at the higher frequencies. This has the effect of eliminating the low tones except those originating directly in front of the microphone, and accentuating the highs. It is a good all around microphone for general tape recording, but it does not have the full pick-up scope needed for real high fidelity.

In some cases you will need highly directional microphones and this is where the ribbon type and the cardioid microphones come into use. The ribbon type consists of a corrugated ribbon hanging in a magnetic field. And since this ribbon is small and cannot pick up from its edge, it is affected only from tones originating either in the front or the rear of the microphone within roughly a 60 degree angle. This is useful if you want to group an orchestra on both sides of the microphone and to place the heavily booming instruments on the dead sides of the microphone. The cardioid type eliminates the back pick-up by a phase cancellation of the sound waves arriving from the rear of the microphone. Here also you will note the directivity at the higher frequencies. Both of these microphones have good

YOUR PICKUP????

. . . . you can improve all your recordings by completely knowing the virtues and faults of the microphone you use.

response from low frequency, 40 cycles, to around 15,000 cycles. They are expensive units, costing \$50 and up, and are mainly used for professional work.

There are other types of microphones, most of which are used for special purposes. One example is the contact microphone used to amplify the sound of musical instruments. One interesting type is the glow discharge microphone in which the resistance of a spark varies as the sounds strike the spark. It is fairly sensitive, but as its electrodes must be replaced frequently, it is not very practical for the home recorder.

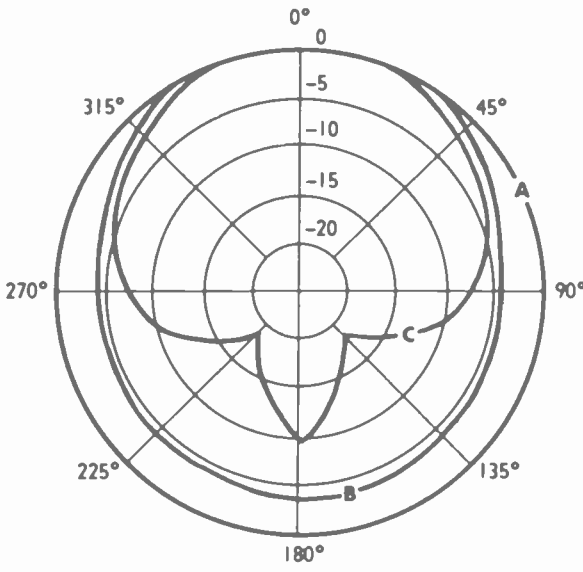
Thus you see that microphones have different characteristics. By knowing these we can place people and instruments in the best location for a high fidelity pick-up. You would naturally place a musical instrument with certain tones in the area designated by the response pattern where such tones will be picked up without attenuation. Conversely, if you want to reduce the output of a particular instrument, you can place it in a spot which is outside of the pick-up pattern for its characteristic frequencies. Thus you can reduce the pick-up from a flute by simply placing it toward the side of the microphone, in the pattern area

responding mainly to the lower frequencies. This low frequency response also explains the fact that sometimes, even though you place a bass instrument to the side of the microphone, its tones still come pounding in.

Another effect frequently overlooked is a decrease in high frequency response with distance and conversely an increase in low frequency pick-up with a reduced distance of the source. You may have noticed this by the thin quality of a distant band pick-up, or in the booming of a speaker's voice when he came too close to the microphone. Actually the closer the speaker is to the microphone the more output will the unit have in the 40 to 200 cycle area, thus those frequencies in the speaker's voice will be amplified more than the higher frequencies.

Of course the environment affects the frequency response of the microphone. You probably have discovered that when you pick up music in one room, the recording is bright and live, while in another it sounds dead. This is caused by the different amounts of reflected sounds which in turn affect the high frequency characteristics of the room. Now you can easily tell which type of room you are using by clapping your hands and listening to the echo. In a live room you will receive a sharp and distinct echo; in a dead room, the sound will be muffled. This will determine the kind of pick-up and set-up you will need.

At this time you will ask, "How do I go about getting a response pattern for my microphone?" The first and easiest way is to ask for a pattern diagram when you buy the microphone. This should give you a basic pattern as it is determined by the manufacturer using a standard



SCALE: 5 DECIBELS PER DIVISION
A—500 cps B—1,400 cps C—3,500 cps

Electro-Voice Model 911 microphone (crystal) and its directivity pattern. A crystal microphone has an average range response of about 60 to 8000 cycles and it is fairly directional at the higher frequencies.

loudspeaker inside an anechoic (echo-free) room. You must then determine what happens to this pattern when you use it in a particular room.

The simplest way to check the directivity of your microphone is to talk into it from a set distance while someone rotates it through 360 degrees. By recording this and then playing it back, you'll be able to tell how much the volume drops between a front and back pick-up. You can also get an idea of the frequency pattern by repeating the process using the high, medium, and low tones of an instrument.

For more accurate results you will need the recording set-up indicated. The main problem is to insure that the sound emitted by the sound source is maintained at the same level throughout the check. You will need an audio oscillator that can generate tones from around 20 to 20,000 cycles per second. If you cannot obtain such generator, than an audio frequency record and a high quality turntable can be used. Then you will want a good amplifier, one that will amplify all the desired frequencies; an audio level indicator—DB meter, to check your output level and make sure it remains constant for all frequencies; and a good loudspeaker, the better you can have here the better. Now you connect all these units as indicated: oscillator to amplifier to loudspeaker, making sure that all the input and output impedances are matched, and the DB meter monitors the output of the amplifier.

The next step is to set the microphone in the position that you will normally use for recording in the particular room. Then place the loudspeaker six or seven feet away from the microphone and turn on the equipment, quickly checking high and low frequencies to make sure that you will have enough volume both for recording and to maintain a set level on the DB meter.

Starting with 20 cycles, record discrete frequencies like 100, 200, 500, 1,000, 2,000, 3,000, 5,000, 10,000, 12,000, 15,000, and 16,000 cycles if you can go that high. For each of these frequencies make sure that the volume is adjusted so that the DB meter reads the same level. This will give you the frequency response of your microphone, including the frequency characteristics of the room, for

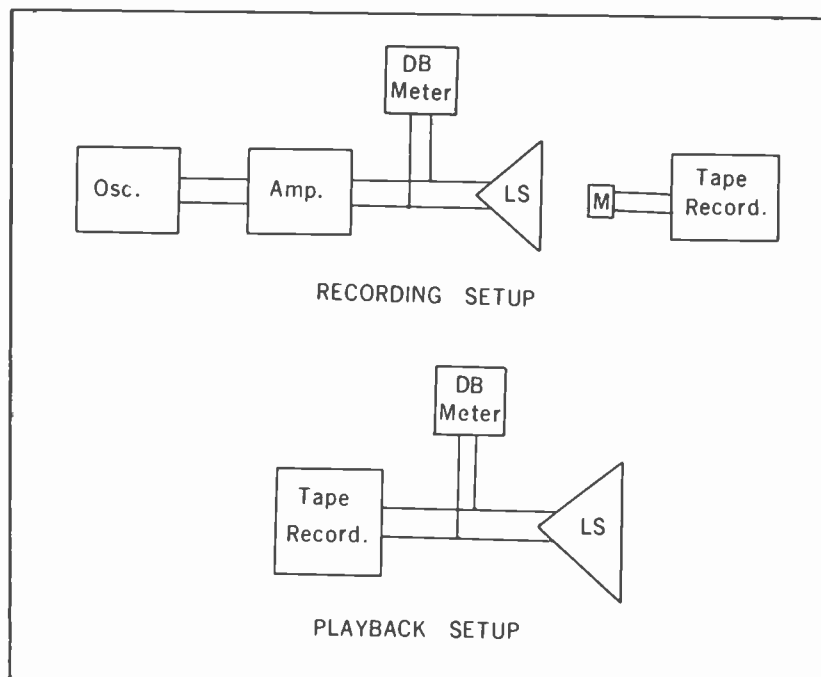
zero incidence, that is, with the microphone receiving the sound from dead center.

To get the frequency directivity, you rotate the microphone through 360 degrees, stopping at say 30 degree intervals, and record the sound at each spot. To facilitate this procedure, you can mark the base of your microphone into 30 degree intervals and then rotate it past a marked spot on the floor. When you play back the results, you can call out the angle each time the microphone is turned, and the frequency each time it is changed.

The playback part is simple. You connect the DB meter on the output of your tape recorder, play back the frequency tape, and just take readings of the DB meter level for each frequency and angle. Plotted on a polar type of graph paper, you will have a response pattern for your microphone similar to the patterns shown, indicating frequency directivity in that particular room.

To check the effect of frequency versus distance a bit more closely, you can repeat the procedure with the microphone at several distances from the loudspeaker. You can do this at several of the high and low frequencies. And while you can interpret this effect from your original directivity pattern, this will give you a better idea of the limits of the room with extremes of frequency—for example, how quickly will bass tones boom, or how high tones will distort with distance.

Now assuming that you have all this information, how do you use it? Well, first, you know that you cannot hear frequencies on your system above those picked up by your microphone. You know the limitations of your microphone. You can place instruments so that their playing range will be compatible with your directivity frequency pattern. You also know how to set your microphone to exclude unwanted noises or frequencies by placing them outside the pick-up pattern. In short, by knowing fully the qualities and faults of your microphone, you can use them to advantage to improve your recording. You don't kid yourself about the overall quality of your high fidelity system. You know exactly how good it is, and what to do to make all your recordings the best possible.





Spring Sound Collection

by Jean Cover

. . . . time to add to your sounds-of-the-seasons tape album—subject, Spring.

SHOULD someone ask me to define "Spring," I could say, it's a season, it's a curly piece of metal with bounce, it's an athletic leap, or I could give the definition I consider best—it's a beginning. And should someone ask me to collect an album of sounds associated with the Spring season, I would build it around "beginnings."

Last Fall we suggested that a four-part series of tapes with sounds of the seasons would make a dandy addition to a creative tape collector's library. At that time we recommended sounds associated with Fall, which we considered a good general basis for such an album. Now our attention is directed to Spring.

We are aware, of course, that Spring throughout our own country and other countries of the world makes its appearance at varied times of the year, and perhaps not at all in some faraway lands. Also, we realize that certain sounds which may be pertinent to one area are unheard of in others.

Spring heralds a multitude of births, as once again in its timeless, perfect fashion, mother earth bears her newborn. Nurtured by the sun's warmth, the rain's moisture and earth's richness, tiny shoots begin to pop up, grass begins to grow, trees begin to bud, everything blooms with freshness.

All of which is not unaccompanied by sound. Because as mother nature bears her young, more often than not they are reared by we less romantic mortals. From the dusty basement closets, or the storage shed, or the garage, or wherever, come an assortment of "rearing" aids such as rakes, hoes, shears, clippers, snippers, fencing, and other sundry gardeners' tools all of which twang, snap, scratch, buzz and scrunch, usually accompanied by most unromantic human mutterings.

Once again the power mower is revved up to see if

it will be in readiness to tackle the coming abundance of growth. By an odd quirk of human behavior, you will find that as soon as the first enthusiastic guy in a neighborhood tries out his mower, or trims his shrubs, or pounds in his fencing posts, it is only a short matter of time before his fellow neighbors follow suit.

When you hear the first thunderstorm that accompanies a spring rain, it is a welcome back sound indeed—an overture to Spring, and your Spring sound album might well use this as its opening.

Just as Spring is the beginning of growing things, so too do we associate it with the beginning of romance. It's much easier to feel romantic without a covering of sweaters, coats, mufflers, gloves and whatnot hiding us from Winter's cold bite and from each other. The sweet fragrance of blossoms and fresh air doesn't hurt the scene any either.

Thus it is that before long as the calendar swings by March 21 we hear a shrill whistle from many a male throat, aptly termed a "wolf whistle." This may well be applied to the same type sound of certain mooning animals and insects, for romance is just about the most universal thing that ever was or ever will be. And many a mating call has been a beginning, no matter what the ending may or may not be.

As warmer climes return in the Spring, so too do birds return to their habitats from whence they migrated for the duration of the cold season. And while it sounds odd to say you heard a "wolf whistle" from a bird, this is exactly what the case may be.

In addition to mating whistles, however, birds warble many other beautiful sounds. Isn't it wondrous to note that each species of bird has its own distinct method of communication, and so it is, not only with birds and other



fowl, but with animals and even insects.

Many folks devote a great deal of time and study to learning about the creatures of nature—their habits, their instincts, their life span, and their communicative sounds. Spring is the time most of these sounds once more begin to fill the air and enthusiastic naturalists begin to search them out.

It unfortunately, but quite naturally, follows that while Spring keeps little Cupid busy, in some instances his aim backfires. So it is that while the sound of mating is prevalent it is sometimes overshadowed by the sound of argumentative retaliation by an unresponsive target, not to mention the interference of a third party.

For instance, if you listen carefully, you would swear two tom cats fighting over a dainty feline were speaking plainly, but with an accent all their own. And chances are too that the cat and dog fight you heard made you think of some two friends, or relatives, or neighbors, or acquaintances of one sort or another.

Spring has another beginning too, which many consider unpleasant, or just a big fat nuisance. It is the beginning of clean-up, fix-up, paint-up, tune-up, check-up time. There comes the sound of windows and doors being opened. Storm windows and doors must be stored away to be replaced by screens; lawn furniture is brought out and brightened up; hoses come into the open and are immediately put to use on windows, furniture, cars and whatnot; house furniture is shoved here and there and still there; rugs are cleaned or replaced by lighter warm-weather materials, clothes are given a final airing and are stored under moth protectives; the furnace is given a going over; and on and on. All these Spring chores are not by any means accomplished in silence and while their sounds may make you wince a little, they are nevertheless a very definite part of the season.

To many, the first tinge of Spring weather directs the thought waves toward one beginning only—travel. Time to take off the snow tires, put the family buggy in tip-top condition, and go-go-go.

Of course, the biggest "go" is vacation, but there are lots of weekends and evenings too. And there are more unexplored areas of interest to visit than there is time to see them all, but every trip, every picnic, every planned or unplanned visit can be kept in your memory forever, especially if the sound is recorded on tape.

Needless to say, at least to any boat owner, Spring signals the time to uncover the floating pride and joy and start whipping her into shape—a scraping job here, a bit of caulking there, a replacement or so may be necessary somewhere, and so it goes. Of course, the most pleasing

sound connected with this endeavor is the final one—the splash the craft makes as it is finally launched.

One Spring sound we mostly all are familiar with, and which many look forward to with eager anticipation, is the sound of a bat against a ball. When you think of it, baseball sounds a little ridiculous and terribly simple—people hitting a ball and running—but oh, the enthusiasm, the exuberant joy or wrath it can evoke.

There are other energetic sounds beginning too; roller skates, the chants used for skipping rope, new and old children's games being played outdoors once again.

Adults too find the noise at the Spring race track meets most interesting, if sometimes uneconomical.

There is one event in our town that many look forward to in the Spring, and if your community doesn't have exactly this type affair, you may have one similar. Ours is a May Mart. This is nothing more than an old-fashioned outdoor bazaar. Here you find stands selling flowers, would-be artists selling paintings, homemade candy and cakes for sale, grab-bags, all sorts of merchants peddling their wares, and the thing I enjoy most (and at my age) sucking a lemon through a peppermint stick. This is all done outdoors under gaily decked stands or umbrellas and there is a good deal of bartering and confusion.

Whatever type affair your community may have, these Spring outdoor festivities surely must be looked forward to as warm weather approaches.

These are some of the sounds we associate with Spring, and which we would certainly include in our album. You undoubtedly have many ideas of your own which are not mentioned.

Sounds related to household clean-up should be fairly easy to obtain. A heavy duty extension cord may be necessary to get the recorder outdoors to pick up others. A regular cord may cause a drop in voltage which would be enough to throw the speed of the machine off and make it run slow.

Many outdoor sounds will require a self-contained portable or an inverter in your car, as well as some extra cable, to operate in the open.

We would like to mention one very handy piece of equipment for capturing bird calls. This is the parabolic reflector. Sound hits this reflector, which is aimed toward the bird, and bounces it into a microphone attached to it. The reflectors are obtainable from the C. W. Torngren Co., Inc., 236 Pearl Street, Somerville, Mass. You will have to attach your own mike to the reflector in the manner you deem best.

To wait hour after hour, day after day, for a particular

bird call or song would be a tiring affair. It is well to note that in the Spring a bird will stake out his nesting area by going from point to point and more or less proclaiming to other birds at each point that the area within belongs to him. He will then build his nest somewhere in that area.

If you watch which boundary points the bird lands at you can set up a microphone nearby and be ready to record the next time he seeks out that location, which he most assuredly will do. It might be a fencepost, a particular bush or tree, a large stone, or some other object.

By the same token, you won't find a frog, or a cricket willing to walk up to a microphone and sing out. Rather, you will have to locate a hiding place and await the opportunity of catching a croak or chirp.

In our region we have Peepers, a member of the frog family. This small animal lives in moist, swampy areas and in the Spring he is among the first to sing out. His song is in the form of a whistle rather than a croak. To some folks it is a bothersome sound, while others claim it can lull them to sleep.

If you want on-the-spot authenticity in your sound album, you will seek out some Peepers' habitat, ready your portable recorder, pull on some hip boots and wade right into that watery spot. Upon your approach the Peepers will immediately cease their song, but if you keep still and wait a few minutes they will begin once more.

On the other hand, to get the sound in a much simpler manner, you could simulate the Peepers' habitat in a bowl, catch one, put him in, and wait for him to sing out right there in your own home.

To all those who may attempt to sneak up on some

romantically inclined lovers we must pass along a warning. Such folks want to be alone, and any interfering source may find a mike and recorder wrapped around his head should he be detected. It would be well to choose some other time and place to pick up spring-fever talk, such as perhaps a teenager or adult making a date over the phone. Some of these conversations can be most humorous, especially when you hear only one side.

Once you have your collection of sounds they will not mean much as such. You will have to do a great deal of editing and narrating to finally end up with a smooth, interesting tape.

Listen to what you do have and note those sections you like best and wish to keep on your final tape. The sounds cannot stand alone, they need some explanation to give the tape a continuity.

Jot down notes for a script to follow. Find a theme or story to frame the whole sound picture.

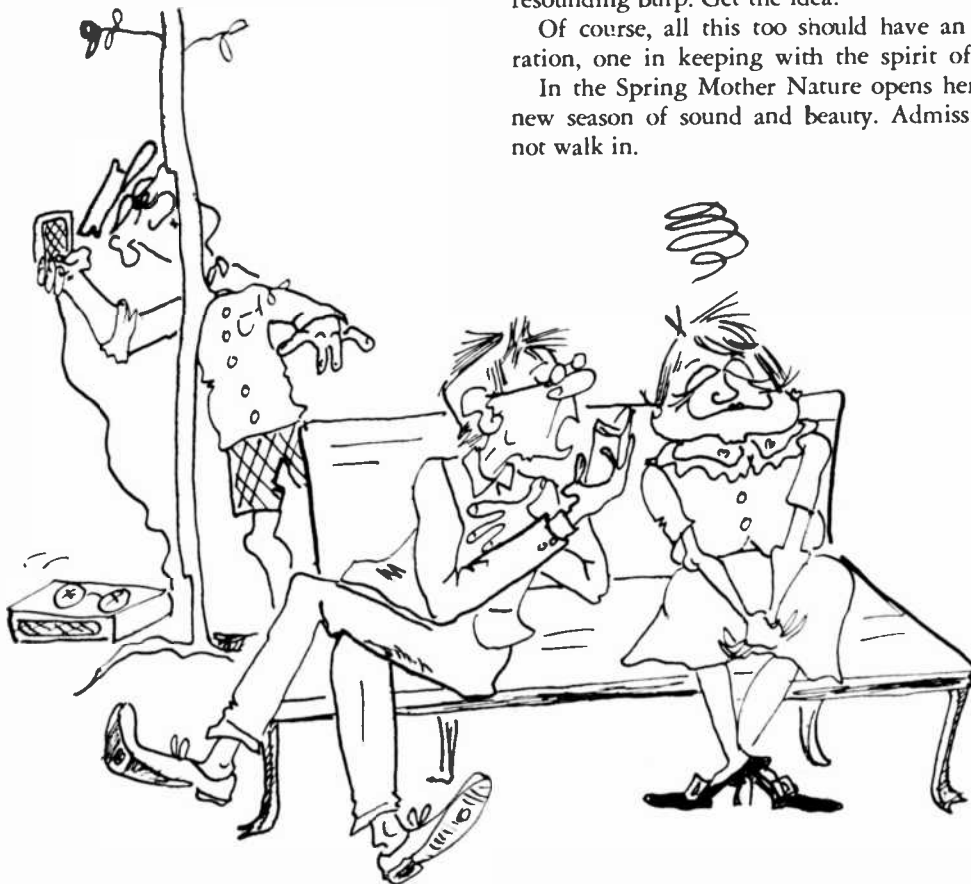
You may wish to intersperse musical backgrounds or bridges throughout the tape. Mendelsohn's Spring Song would be an excellent selection to use on this tape.

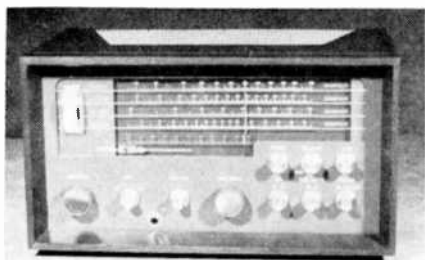
After completion of this tape, for something a bit different, you might try another variation of Spring sounds. By using a contact microphone, simulated sounds, and a witty imagination you can piece together a tape unlike any heard before.

You might include sounds representative of a flower shooting up, such as a slide whistle and then the blossom popping open via a bubble gum snap. Perhaps you would then have the leaves open thanks to the sound of a squeaking door. The sequence could be continued by a butterfly or bee landing on the blossom (tires screeching) and the hungry little fellow sipping nectar (a straw in a just emptied—almost—glass) followed by a resounding burp. Get the idea?

Of course, all this too should have an appropriate narration, one in keeping with the spirit of the whole tape.

In the Spring Mother Nature opens her door to a fresh, new season of sound and beauty. Admission is free—why not walk in.





Recording the Short Wave Stations

by Bart Pierson

. . . . Reception and recording around the world is possible on short wave.

BACK in the early days of radio the biggest thrill was to log the reception of far-away stations. Those on the east coast would sit up to all hours of the morning hoping to catch a west coast station before it went off the air. The late hours were necessary because the more powerful local stations frequently masked the far-away stations and it was necessary to wait until they went off the air so that the weaker stations, at or near the same spot on the dial, could come through.

At the bus stops, on the commuter trains, in the offices and shops the conversations sooner or later turned to the stations pulled in the night before. Newspapers even ran DX columns, reporting the reception achieved by readers.

Now-a-days, with vastly improved radios, picking up a station across a continent is easy but the old thrill is still very much alive on the short-wave bands.

The stations which are found in the regular broadcast band, running from 550 to 1650 KC on the dial are long wave stations. Their signals follow the curve of the earth, becoming progressively weaker as the distance from the station increases.

The short wave stations are in the area lying above 1650 kilocycles and run into the megacycle range. Unlike long wave signals, the short wave impulses travel pretty much in straight lines. Some of them shoot right out into space, never to be heard, but others are reflected back to earth by the Heavyside layer, a layer of ionized particles that completely encircles the earth. As they are reflected from this, like light from a mirror, they strike the earth with almost their full intensity. They are again reflected spaceward and again are bounced off the Heavyside layer back to earth. So they travel around the earth being reflected and re-reflected.

If a short-wave receiver is in an area where the wave is striking the earth, reception is excellent. If the receiver is under a spot where the wave is striking the ionized layer high above the earth, little or nothing can be heard.

In addition to the Heavyside layer, such things as meteor showers will also reflect the waves. In fact, some communications systems use these showers for bouncing signals into desired spots. The transmitters are always "on the ready" and whenever a shower occurs, the transmitter turns on and fires its messages with great rapidity, cutting off automatically as the shower comes to an end.

It is this very uncertainty in shortwave communications that brings back the old thrill of chasing DX stations. On some days, or at some hours, Australia or Japan will positively boom through. At other times they are extremely difficult to pick up. Sometimes the signals coming from north or south will be fine while those from east to west are poor. You never know, until you turn on the set what will happen.

Some of the "ham" radio magazines do publish tables giving the probabilities of reception on various bands

for periods of a month. These are of some help in deciding what to seek but they can be upset by unlooked for sun spot activity and other causes.

What this all adds up to is a lot of fun. Until you turn on the switch on the short wave set and start turning the dial you never know what you will be able to pick up.

Short wave receivers come in many forms, from simple units selling for under \$50 to professional gear costing many hundreds. And if you really get serious, such items as rotatable antennas and antennas cut for the best results on certain bands can be added to the gear.

The newest receiver at a moderate price is the National NC-105 and it has a new extra feature—a tuner output that permits it to be connected to a home hi-fi system or a tape recorder. It covers the regular broadcast band plus short wave bands out to 30 Mc. It is also available in an oiled walnut enclosure so it will fit in with the living room decor.

With the receiver hooked up to the tape recorder you will have a means of making an actual record of your DX exploits. You will be able to record Australia, or England or the commies making nasty cracks about us on the news broadcasts.

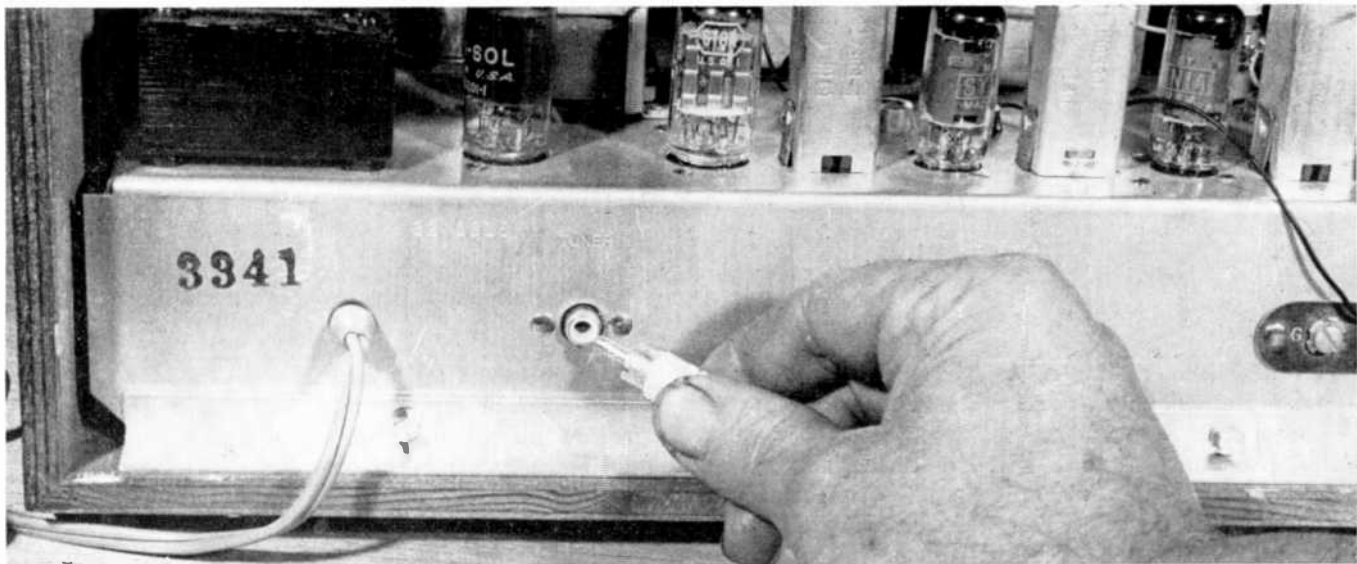
If you are studying a foreign language, recordings from the land where the language is spoken will provide excellent material for language study. The news broadcasts are excellent for this purpose as are the commercials, talks or dramatic programs.

One advantage of making foreign language tapes from the short wave stations is that you are getting the native speech without it being filtered through someone else's accent. Not only that but the announcers, as are our own, are usually picked for their clear enunciation and phrasing—a distinct advantage if your translation speed is not very high to begin with.

Actually we have found the commercials excellent material to listen to, record and use for practice. Next in order would be monologues and discussion programs. Again, as with our own native speakers, some voices are clear and distinct and others are less so. Regional accents are also heard which serve to sharpen the perception of the language.

Many times on short wave broadcasts the fit is not so hi. Atmospheric and other interference can garble a transmission very badly at times, all of which, while it may be exasperating, does provide the challenge that makes the game interesting.

A collection of music around the world would make a fascinating reel. As one proceeds either west or east from the United States the differences begin to show. The extreme is music from the Orient where the diatonic scale is used and vocals are strictly out of this world by western standards. In between there is a blending of the cultures musically.



On the rear of the chassis of the National NC-105 is this jack which is used to feed the home hi-fi system or recorder from the short wave receiver. The output is from the detector stage and should be fed into the mike input. If this is unsatisfactory, power may be taken from the headphone jack or from the speaker terminals which are very accessible.

When you make a recording of each of the segments around the world and then splice them together in order, going from east to west or vice versa, you will have a musical travelogue that will prove of great interest.

Because we are so accustomed to our regular broadcast band which appears on all radios, we are inclined to think that this is the beginning and end of radio. Actually the broadcast band is but a very small part of the radio spectrum. Many countries overseas have short wave stations only. Aircraft communications, ham radio, TV, FM, navigational aids and a lot more assorted activities go on in the short wave bands. Lots of these make good listening, and good recording.

Operating a short wave receiver is not like pushing the buttons on your car radio. There are so many stations, in many cases so close together, that careful tuning must be done. The National receiver has a bandspread tuning dial which permits fine tuning the receiver.

The tuner output on the unit feeds from the detector so the amplifier with which it is used should have a pre-amplifier stage in it. The connection for the tape recorder may be taken from the amplifier. In this way you will be able to hear what you are recording since switching the radio to tuner silences the speaker in the set.

The tuner output is a high impedance output suitable for connection to the tuner or one of the auxiliary inputs on the amplifier. The amplifier gain control should be set to a normal level and the listening level controlled with the AF gain of the radio. It should be plugged into the microphone jack on a recorder.

A low impedance output is available by using the headphone jack on the front panel. This is a 3.2 ohm output and is suitable for feeding into the phono input on a recorder. When a plug is inserted in this jack the speaker in the set is silenced. In order to hear what you are recording, the monitor switch on the recorder must be used.

If your recorder has no monitor switch, power may be taken with alligator clips from the speaker terminals which are very accessible through the rear of the case. When leads from the speaker terminal are used they should be plugged into the phono input on the recorder.

In addition to making tapes of foreign broadcast sta-

tions you can also keep a log of the stations heard, listing the date, time and frequency. Most of these stations like to hear from listeners and mail out colorful cards confirming the reception and providing information about the station and country. The collection of these cards makes an interesting hobby in itself.

If you would like more information, it may be obtained from the following Official Log, National Association of Armchair Adventurers, National Radio Company, Melrose, Mass., World Radio TV Handbook, World Radio Publications, 47 Mounthaven Dr., Livingston, N. J., White's Radio Log, C. DeWitt White Co., PO Box 142, Bronxville, N. Y. Ham radio magazines such as QST and CQ and government publications are also helpful.

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

THE BIAS OSCILLATOR

by Mark Mooney, Jr.

Part IV of a series

WHEN Valdemar Poulsen invented the first magnetic recorder back in 1893 he had a fine design but not much luck for one of the chief ingredients of successful recording was not discovered until the mid-1920's.

Recordings made on the early machines suffered from distortion, weak signals and a great deal of noise and hiss. The reason lay in one part of the machine—the bias supply. In the old machines a DC bias and erase was used. In modern machines AC bias and erase is employed. This was discovered by W. L. Carlson and G. W. Carpenter of the Naval Research Laboratories who obtained a patent on it in 1927.

Why is bias necessary? Because there is an inherent fault in all magnetic recording media which requires the use of the bias current to correct it.

Tape will not produce a linear response all by itself. A linear response may be defined as one in which you get out of the machine on playback what you put in in the record. For instance, if a signal is fed to the head that is twice as strong as another signal one would expect that on playback the stronger signal would sound twice as loud. If proper biasing is used, it will be twice as loud. If DC or no bias is used you might come up with anything. The signal might even be weaker instead of stronger.

The signal that comes back to us out of the loudspeaker on playback is caused by the remnant flux that is present in the tape. As this passes the head it causes currents to be set up in the head windings that are amplified and

produce the sound which we hear.

The remnant flux on the tape is that which is left after the magnetizing force is withdrawn. The recording head magnetizes the tape but the signal which remains on the tape is not as strong as the magnetizing signal. Nor, without bias current, will the signal on the tape be proportional to the magnetizing signal.

While the recording head is called "the heart of the tape recorder" the bias oscillator might rate as the "brain."

In the old system of DC bias, the tape was first passed across a permanent magnet which oriented all the magnetic domains on the tape in one direction and saturated the tape magnetically. In addition a small amount of DC was applied to the recording head along with the signal. The direct current served to put the recording on the linear portions of the hysteresis curve of the tape.

As the tape passed the head, it was actually demagnetized by the signal, which was an alternating current. The amount of demagnetization was determined by the strength of the recording signal.

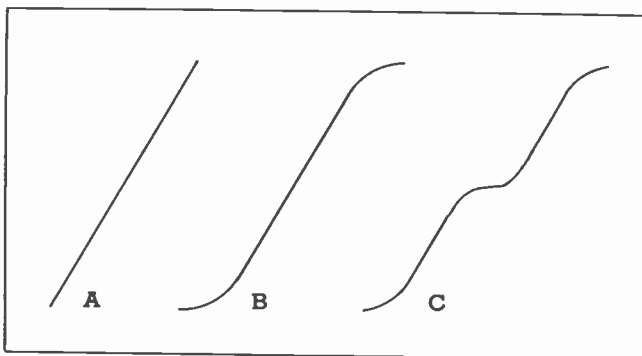
This method failed to take advantage of the potential degree of magnetization of which the tape was capable and, unless the amount of magnetization from the permanent magnet, and the amount of DC in the head were critically adjusted, distortion of the signal resulted, in addition to a high hiss and noise level. It was these defects which spurred the search for some other method which would realize the full potential of the tape.

The answer was found in the AC biasing method. The need for the bias current has been well established but the "why" of it is still subject to discussion. One theory holds that it is necessary to jar the magnetic domains into an active state so that the audio signal can easily arrange them in the desired pattern. This might be analogous to a locomotive backing up slightly then moving ahead sharply, the resulting jerk getting the cars rolling.

Oddly enough, the bias signal itself, which may be many times the strength of the recording current, is not recorded on tape, it simply serves as a carrier for the audio signal and then disappears. It is somewhat like the propellant in a pressure can which forces the paint or other material out of the nozzle, yet it does not form a part of the finished coating.

The bias current is generated in the recording pre-amplifier by either a single tube or, in the professional recorders, by two tubes working in push-pull to reduce harmonic distortion to a minimum. The grid and the plate of the tube are connected to a capacitor and inductance, the ratings of which determine the frequency of oscillation.

This frequency is rather important and it is determined by the engineer who designs the recorder circuitry. It must be higher than the audio frequency, otherwise it



An ideal "curve" for any recording and reproducing process is represented by a straight line signifying that anything you put in comes out the same. Such a "curve" is shown at A. At B is a curve typical of photographic materials. It has a "toe" at the bottom, a long straight-line portion and a "knee" at the top. If you expose film properly all the tones in the picture will fall on the straight-line portion and be properly reproduced in the finished print. At C is shown the response curve for magnetic tape. Note the toe, the short straight-line portion, horizontal middle section, another short straight-line portion and the knee at the top. The swinging back and forth of the bias current shifts the recorded signal to the two straight line portions of the curve to assure proper recording and reproduction, skipping the middle section which would introduce distortion.

would record on the tape. Usually a figure of five times the highest audio frequency is used. Thus a recorder capable of handling 10,000 cycles per second should have a bias frequency on the order of 50,000 cps.

The reason for this is to avoid heterodynes, or whistles. In any audio signal, there will be harmonics generated along with the main signal. The second and third harmonics are the strongest and if these "beat" against the bias frequency a whistle will result. For instance, the third harmonic of an 8,000 cycle note would be 24,000 cycles. If the recorder bias frequency were only 30,000 cycles there would be a difference between them of 6,000 cycles which is in the audible range and would produce a high pitched squeal whenever an 8,000 cycle note showed up in the recorder. Present day designs in home type recorders will call for a bias frequency of 40,000 to 50,000 cycles and the designers of professional machines will use a bias frequency of 80,000 cps.

In addition to supplying the bias current to the head, the bias oscillator is also used to energize the erase head to clean the tape of signals before it reaches the record head. As may be imagined, the erase current requires considerable power. Since it is difficult to generate high frequencies having great power, the engineer must effect the best compromise he can. A low frequency of bias current will make it easy to get the required amounts of power to operate the erase head but, at the same time, this may produce a heterodyne if it is too low. There is no upper limit to the bias frequency but the higher it gets, the weaker it becomes and powering the erase head becomes more difficult.

The current required for erasure may be in the neighborhood of thirty times as much as that needed to properly operate the recording head. Most erase heads will need about 4 watts of power to operate efficiently. The design engineer will thus be limited in choosing the bias frequency by the amount of power which the circuit can deliver at that frequency. Fortunately the compromise which must be effected is at a point which will provide sufficient current and a sufficiently high bias frequency.

Of great importance is the strength of the bias current to the recording head. As mentioned earlier, the purpose of this current is to put the audio signal on a portion of the tape response curve which will provide a true playback. If the bias current is too weak the low frequencies will be lost. Also indicative of a bias current which is too weak is the presence of distortion and a loss of signal to noise ratio and the uniformity of the recorded signal may be lost.

If the bias current is too strong, there will be a loss of the high frequencies because the strong current makes the record head act as a weak erase head on the high frequencies. The high frequencies suffer most because they are the weakest signals on the tape and are consequently more sensitive to erasing action.

Again the design engineer is faced with a choice. As the strength of the bias current is increased the low frequencies will become stronger and stronger, reaching a peak and then falling off. The point where the low frequencies are strongest, just before they start to fall off, is known as the "peak bias" point. The ideal point at which to set the bias is at this "peak" since it will provide the best low frequency response and, at the same time, will give the minimum distortion and affect the

high frequencies the least.

Some tape recorders are equipped with an adjustment that permits the bias to be varied after the machine leaves the factory. This permits the owner to get the type of response that seems maximum to him. Machines which have no bias adjustment generally are designed to be slightly over-biased to take care of variation in components in the circuit. This provides a small safety factor but it does cut the output potential very slightly.

The waveform of the bias current, as seen on an oscilloscope, must be very uniform and of good sinusoidal form. This is necessary because of the peculiarities of the tape response curve.

Unlike the response curve of photographic film, which has a rounded "toe," a long straight line portion and a "knee" at the top, the response curve of tape has a toe, a short straight line portion, a horizontal middle portion, another straight line ascending portion and then the knee at the top.

The bias current by shifting back and forth as it alternates, throws the signal on the two straight line portions of the curve, missing the toe, the flat middle part and the knee. A bias oscillator that is putting out a waveform which is larger on one side than the other will throw the signal out of position on the curve and thus create second harmonic distortion.

Unlike AM radio which has a carrier wave that is modulated by the audio signal (it looks something like a pile of hour glasses stacked on one another) the bias current plus the recording current swings from side to side like a snake going across a piece of glass. This side to side shift, as has been mentioned, causes the flat middle part of the response curve to be missed so that the signal falls alternately on the two straight line portions of the tape response curve.

Having so much responsibility for the proper functioning of the recorder, the bias oscillator is a good starting point to look for if something goes wrong. If the recording is weak or distorted or if the machine will not erase properly the odds are that the difficulty is in the bias oscillator.

The oscillator tube or tubes should be checked out first and if they are putting out the proper amount of current then the component parts of the bias oscillator circuit must be suspected. A resistor, capacitor or other part may have changed its value through age or other cause, throwing the oscillator off in either strength or waveform, both of which are of prime importance, as has been explained.

While the strength of the oscillator current may be measured with a good meter, it takes an oscilloscope to get a picture of the waveform.

The oscillator functions only when the machine is in the record position, activating the erase head and providing the necessary bias current to the record head to get a true recording of the sounds entering the microphone or from another source. On playback it is switched out of the circuit since it is not needed. A machine which plays back satisfactorily but which will not erase or record properly most probably has a defective oscillator.

While all parts of a tape recorder are more or less essential to the operation of the machine, some are "more essential" than others. The bias oscillator buried in the "innards" falls into this category.

NEW PRODUCT REPORT

STA **OK** STED



V-M MODEL 730

... a dual track three-speed monophonic recorder of moderate price with excellent characteristics.

THE V-M 730 tape recorder is a monophonic unit featuring three speeds, $7\frac{1}{2}$, $3\frac{3}{4}$ and $1\frac{7}{8}$ inches per second which are selected by turning a knob situated between the reels. The recorder must be on when speeds are changed.

The unit is compact, measuring only $7\frac{1}{2}$ " x 13" x $14\frac{1}{4}$ " and weighs approximately 22 pounds, making it easy to transport.

The case is made of high impact plastic with a leather finish in light tan. Trim parts are gold and the deck is dark brown.

We believe that the ladies will be pleased with the appearance of this machine since it has gotten away from the "suitcase look" which has kept recorders out of living rooms for years. The styling of the whole unit and its subdued tones will fit nicely with almost any decor.

The handle for carrying is spring loaded and is held against the case and becomes part of the decoration when not in use.

A red jewel light on the front grille

indicates when the machine is on. Behind the grille is a 5 x 7 inch speaker with a 2.15 oz. Alnico V magnet. The power output is ten watts.

The recorder has a number of features which make life easier for the recordist. One of these is the "Pause" button located on the left side of the deck. When this is pushed backward and to the right it will stop the tape noiselessly in either play or record.

It is useful when recording from radio or TV to get rid of any unwanted parts of a program, such as the commercials. It is also very handy when using the machine for dictation to stop it while collecting one's thoughts.

Next to the pause button is the odometer type counter and to the right of this are the tape motion controls of rewind, stop, play/record and fast forward.

On the right side of the deck is the monitor button, which matches the pause button in appearance. This is used to switch an incoming signal through the recorder speaker. This is

Product: V-M Model 730

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

Price: \$169.95

useful when recording from a tuner or other sound source where it is desired to hear the program material as it is recorded.

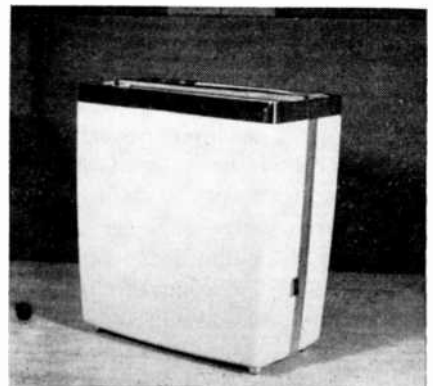
The microphone input jack is located on the right side of the deck at the front where it is readily accessible.

There are two tone controls, one for treble and one for bass. The treble control is effective over a 27 db range and the bass control over a 12 db range. These are effective in playback only. When in record the response is flat.

Our check of the frequency response showed it to be excellent. At 10,000 cycles at the $7\frac{1}{2}$ ips speed the curve was right on the line where it should be and the machine goes out to far beyond this. The results measured by putting a signal on the tape through the recorder and then playing it back again through the machine very closely paralleled the results obtained with a professional test tape.

FM music was recorded using the 730 and this was played back through an excellent home hi-fi system feeding the amplifier from the external amplifier jack on the machine.

The results were of such caliber that the sound from the V-M 730 could not be told from that produced by a machine costing three times as much! Reproduction from the speaker con-



The 730 with case closed. The case is of high impact moulded plastic in light tan. Trim parts are gold, deck brown.

tained in the recorder is very good. The signal to noise ratio is better than 50 db, as are the erase and track separation.

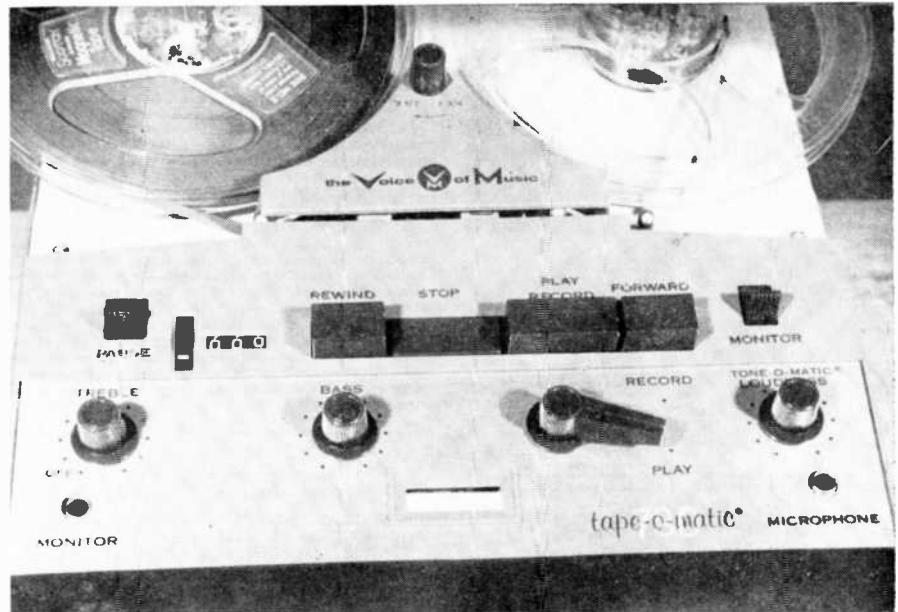
The tape motion controls are all interlocked. To put the machine in the record mode, it is necessary to push the play/record lever to the record position and then depress the record/play button. It will remain in this position until the stop button is depressed whereupon the lever will snap back into the play position.

Since these controls are both large enough to handle easily, in contrast to some machines which have obscure interlock buttons, no difficulty in operation should be encountered by inexperienced persons.

The microphone furnished with the recorder has its own built-in legs which permit the mike to stand up on any flat surface. The legs fold flat against the case for hand held use. A neck cord with clips is also included in the accessory package. When attached to the mike, it may be hung from the neck lavalier fashion, leaving both hands free. The mike cord is eight feet long and has a shielded plug.

To record using the microphone, the plug is pushed all the way in the microphone jack. When recording from radio or TV or from a phono where the output is higher the plug is pushed only half-way in. Pushing it all the way in when recording from a high level source will cause distortion. The phono adaptor plug should be used when making recordings of this type.

The external speaker receptacle on the rear of the recorder does not silence the recorder speaker when it is used. Also on the rear of the machine are found the external amplifier jack,



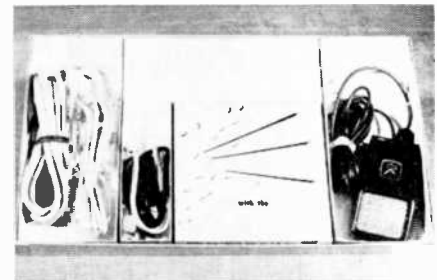
Controls include: speed control (7 1/2, 3 3/4, 1 7/8 between reels at top), pause button, index counter, rewind stop, play/record and fast forward button, monitor switch, monitor jack for headphones. On/off switch and treble control, bass control, recording level indicator, record/play lever, volume control and mike input.

for feeding an external amplifier or hi-fi system and the synchronizer jack. The latter accommodates the sound cord from the V-M 1412 slide projector synchronizer which is used to operate a slide projector from the tape recorder for tape-slide shows.

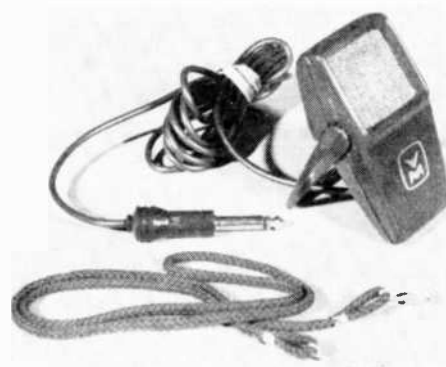
The unit has six tubes and pulls 120 watts. The power supply is transformer operated employing full wave rectification.

We think it would be a disservice not to mention the instruction book which comes with the machine. It is well designed and well illustrated but what's more important is detailed and complete. Such, unhappily, is not always the case and the tape recorder buyer is left in the dark on many details of machine operation and recording technique.

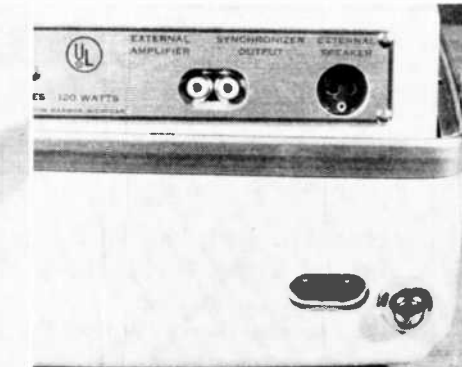
In our opinion V-M has done an excellent job on this machine, both from the standpoint of attractiveness and electronic performance. We think it is well worthy of your consideration if you are planning to buy a monaural machine.



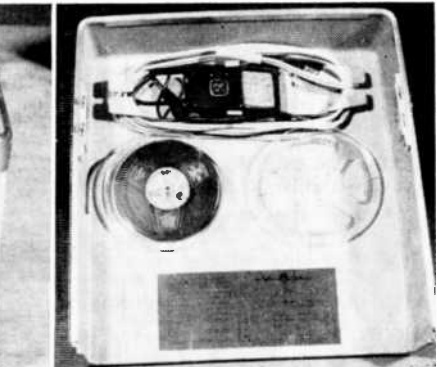
Accessories furnished with recorder include mike with built-in stand and lavalier cord, alligator clips for recording from speaker, audio connecting cords and plugs, external speaker adapter plug, tape, and tape labels.



The microphone has its own built-in stand which holds it in position on any flat surface. A lavalier cord is furnished for hanging the mike around the neck.



On the rear of the case are the external speaker jack, the external amplifier jack, a jack for connection to the VM slide synchronizer and power input receptacle.



The lid has storage space for the microphone and its cord, the cord for connecting to the power supply and pins which will hold two five inch reels in place.

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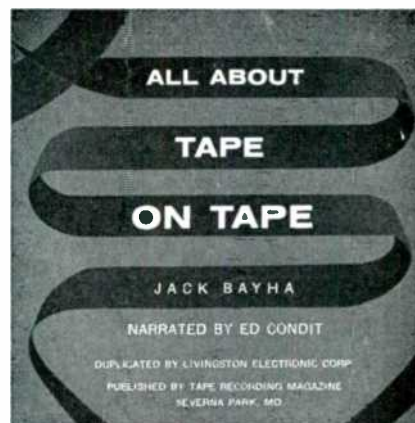
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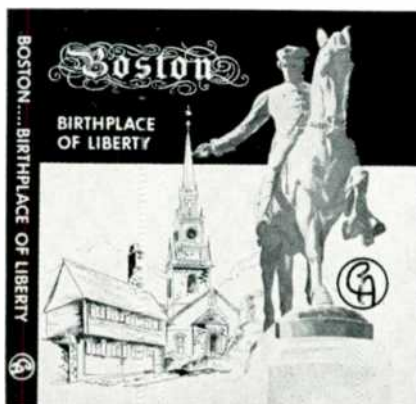
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