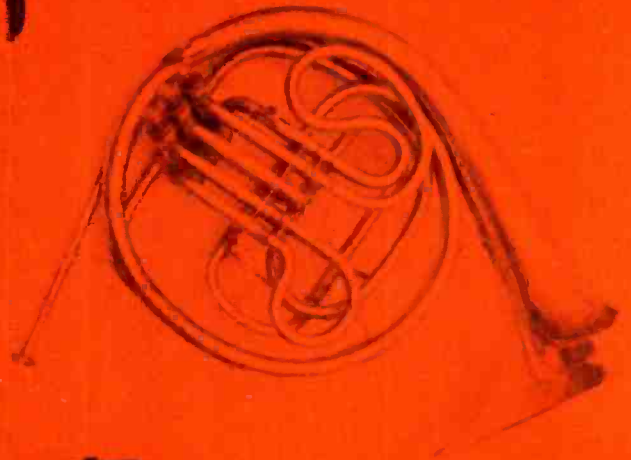


TAPE RECORDING



Mr. Roy Perrin
231 Woodland Ave.
Rutherford, New Jersey

Special Issue:

HOW TO RECORD
MUSICAL INSTRUMENTS

March, 1962

35c



toot

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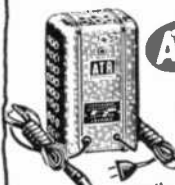
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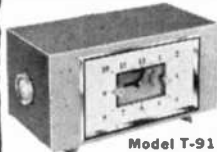
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TAPE RECORDING

VOL. 9 No. 4

MARCH 1962

MARK MOONEY, JR.
Editor and Publisher

JOHN L. ALLEN
Circulation Manager

JEAN COVER
Assistant Editor

ROBERT W. LAPHAM
Art Director

JAMES H. MILLS, SR.
Technical Consultant

ANTHONY J. MORIN, JR.
National Advertising Manager
274 Madison Ave., New York 16, N. Y.

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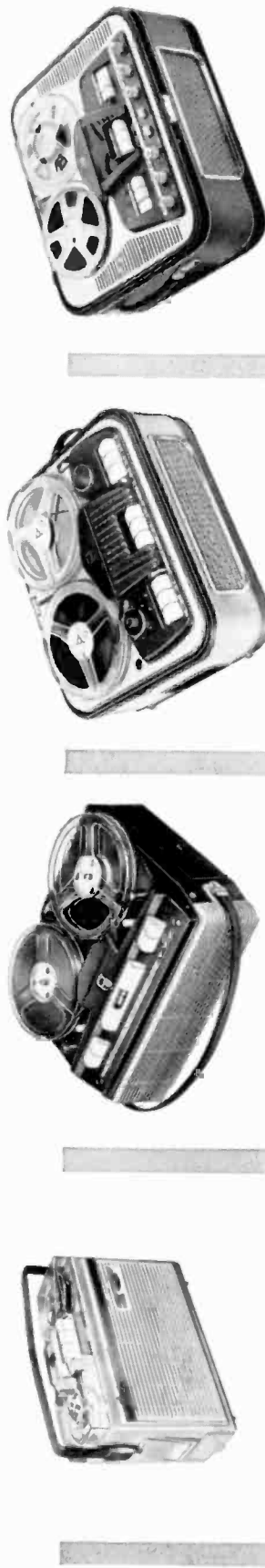
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Buyer's Guide and Condensed Applications Chart—Norelco® 'CONTINENTAL' Tape Recorders

This condensed guide is published by the High Fidelity Products Division of North American Philips Company, Inc. It offers the consumer the factual data he needs to select the tape recorder best suited to his specific requirements.



	Continental '100' Model EL 3585	Continental '200' Model EL 3541	Continental '300' Model EL 3542	Continental '400' Model EL 3536
PRIMARY USERS	The entire family—at work, at play, at home or away.	Serious music lovers with limited budgets.	Schools, churches, teachers of voice and music. Psychiatrists, speech therapists and recreation directors—and collectors of pre-recorded stereo tapes.	Professional musicians, studio recordists, serious music lovers, high fidelity enthusiasts. Commercial sound installations.
ESPECIALLY SUITABLE FOR	On-the-go, on-the-shoulder recording and playback—anything, anytime, everywhere.	Portable, high-fidelity tape-deck applications. Portable public address.	Audio visual and all specialized teaching applications; music program source for factory, office and home; portable P.A.	Professional-quality stereo recording, live or broadcast; space-saving hi-fi system control center and portable P.A.
SPECIAL FEATURES	Battery-operated, 100% transistorized, feather-light. Records from any source. Tapes interchangeable with all 2-track 1 7/8 ips recorders.	Stereo head output direct to external stereo preamp. Records sound-on-sound. Mixing facilities. Compact, lightweight, inexpensive.	3 speeds. Stereo head output for playback through external stereo preamp. Records sound-on-sound. Mixing facilities. Headphone monitoring.	Completely self-contained for stereo recording and playback at all speeds. Price includes dynamic stereo microphone. Transport mechanism meets all professional standards.
RECORDING CAPABILITIES	Monophonic 2-Track	Monophonic 4-Track	Monophonic 4-Track	Stereo and Mono 4-Track
PLAYBACK CAPABILITIES	Monophonic 2-Track	Monophonic and Stereo* 4-Track	Stereo* and Mono 4-Track	Stereo and Mono 4-Track
SPEEDS	1 7/8 ips	7 1/2 ips	7 1/2, 3 3/4, 1 7/8 ips	7 1/2, 3 3/4, 1 7/8 ips
PLAYING TIME PER REEL	Up to 2 hrs. on a 4" reel	Up to 4 hrs. on a 7" reel	Up to 16 hrs. on a 7" reel	Up to 16 hrs. on a 7" reel.
WEIGHT	7 lbs.	18 lbs.	30 lbs.	43 lbs.
SUGGESTED LIST PRICE	\$129.50	\$179.50	\$269.50	\$399.95

For complete technical data and detailed descriptions of Norelco Continental Tape Recorders, write:

NORTH AMERICAN PHILIPS COMPANY, INC., High Fidelity Products Division, 230 Duffy Avenue, Hicksville, L. I., N. Y.

*Tape head output.

NEW TAPES

★—Fair

★★—Good

★★★—Very Good

★★★★—Excellent

CLASSICAL

Reviewed by Robert E. Benson



Music ★★★★★

Performance ★★★★★

Fidelity ★★★★★

Stereo Effect ★★★



BRAHMS: Clarinet Quintet in B Minor, Op. 115
CONCERTAPES 4T 4006
4-track, 7½ ips
\$7.95...35 min.

MOZART: Clarinet Quintet in A, K. 581
CONCERTAPES 4T 4005
4-track, 7½ ips
\$7.95...30 min.

No finer versions of these chamber music masterpieces exist anywhere on tape or disc, and these tapes are a wonderful initiation for those who are not familiar with chamber music. Reginald Kell's playing combines virtuosity with delicacy, and the Fine Arts Quartet's playing is masterfully secure and resilient.

CONCERTAPES has proven here that tapes can be produced with negligible hiss and no crosstalk; throughout the stereo medium is intelligently used, with close miking providing just the right separation. These two tapes, both appealing to the same audience, would have made an attractive twin pack.



Music ★★

Performance ★★

Fidelity ★

Stereo Effect ★★

TCHAIKOVSKY: 1812 Overture **BERLIOZ:** Hungarian March **SIBELIUS:** Valse Triste **LISZT:** Hungarian Rhapsody No. 2 **WEBER:** Invitation of the Dance
Philharmonica Orchestra conducted by Herbert von Karajan
ANGEL ZS 35614
4-track, 7½ ips
\$7.98...47 min.

Angel has so many great performances and recordings in their catalog that it is difficult to understand why they selected this for release on four-track tape. Perform-

ances are not of particular interest, and sonically there is much to be desired, with an over-all lack of clarity and absence of true bass; one of the most disappointing tapes we've ever had for review.



Music ★★★★★

Performance ★★★★★

Fidelity ★★

Stereo Effect ★★★

BERLIOZ: Roman Carnival Overture, Op. 9
Beatrice and Benedict Overture
The Corsair Overture, Op. 21
Benvenuto Cellini Overture, Op. 23
Royal Hunt and Storm
Boston Symphony Orchestra conducted by Charles Munch

REA FTC 2059
4-track, 7½ ips
\$8.95...44 min.

Munch is perhaps the most sympathetic conductor of the music of Berlioz before the public today, and here we have a varied program including some of that composer's lesser-known music, notably the *Benvenuto Cellini Overture*. The other overtures (*Roman Carnival*, *Beatrice and Benedict*, *Corsair*) are fairly well known. The tape also includes the *Royal Hunt and Storm* from the opera *The Trojans*, unfortunately omitting the choral passages which are included on several of the disc versions.

Munch conducts all of this music with a blazing intensity and high regard to the composer's style, and the Boston Symphony plays brilliantly. Unfortunately, the sound quality is not particularly good, with over emphasis on the highs, and rather ill-defined bass. However, reproduction is adequate to convey the performances and the tape is from a musical standpoint very successful.



Music ★★

Performance ★★

Fidelity ★★

Stereo Effect ★★

DELIBES: Coppelia Ballet
Suisse Romande Orchestra conducted by Ernest Ansermet
LONDON LCK 80001
4-track, 7½ ips
\$11.95...88 min.

Delibes' toy-shop ballet masterpiece receives a near-definitive performance on this packed reel. Ansermet and his orchestra are here associated with the type of music they play best of all, with scintillating, light-textured sound from London.



Music ★★★★★

Performance ★★★★★

Fidelity ★★★★★

Stereo Effect ★★★★★

BRAHMS: Piano Concerto No. 2 in B Flat Major, Op. 83
Sviatoslav Richter, pianist; Chicago Symphony Orchestra conducted by Erich Leinsdorf
RCA FTC 2055
4-track, 7½ ips
47 min...\$8.95

This controversial performance was recorded in October of last year, at the beginning of Richter's tour of the United States, a tour which established him immediately as a highly individual, mature artist, apparently with no technical limitations. Although some listeners may question certain points of interpretation, it cannot be doubted that this is great playing. The Chicago Symphony is in top form under the baton of Erich Leinsdorf, who stepped in at the last minute substituting for the ailing Fritz Reiner.

Reproduction is superb, with a natural balance between the rich piano and splendid orchestra. Tape processing is admirable, with only the faintest traces of echo, and negligible hiss. A thoroughly distinguished release.



Music ★★★★★

Performance ★★

Fidelity ★★

Stereo Effect ★★

"THE SOUND OF WAGNER" (Prelude to Act III of Lohengrin; Tannhauser Overture; Siegfried's Funeral Music from Die Gotterdammerung; Dance of the Apprentices and Procession of the Mastersingers from Die Meistersinger; Ride of the Valkyries and Magic Fire Music from Die Walkure)
Concert Arts Symphony Orchestra conducted by Erich Leinsdorf
CAPITOL ZP 8411
4-track, 7½ ips
\$7.95...45 min.

Capitol seems to rate these performances very highly in their catalog; they have already appeared on two-track stereo tape, and this was one of their first stereo disc releases. With a hand-picked studio orchestra, Leinsdorf offers scintillating performances of these familiar Wagnerian excerpts. Best of the lot is the thrilling *Ride of the Valkyries* and *Magic Fire Music*, although the new Victor tape of the *Ride* with Stokowski and the Symphony of the Air is even better.

These performances appear to have been recorded in a large hall, with considerable manipulation of the controls. The high frequencies are definitely boosted a bit too much, and the sound of artificial reverberation is ever present, as a reminder of Capitol's techniques in their early days of stereo, which fortunately now they no longer use.

If I had to select one Wagner collection on four-track tape, my choice unquestionably would be Stokowski's on Victor FTC 207 (\$8.95).

POPULAR

United Stereo Tapes Samplers

This organization, which markets tapes of the leading recording companies under the UST label, has now added a twin-pack series of samplers to their earlier single samplers (reviewed here Aug.-Dec. 1961). These three, namely, "Dance Beat," "Broadway" and "Moods," run 68 mins., 69 mins., and 80 mins. respectively, and at the suggested list price of \$7.95 represent the very best value in the popular music tapes today. For the tape fan interested in acquiring a library, they offer an infinite variety of music to satisfy the taste of almost everyone. It is a relief to have the theme change with practically every number. There is a sameness to full tapes by a single artist, but these samplers do not have that trouble.

In addition to the well chosen artists and selections, the fidelity, presence and recording technique are excellent.



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

DANCE BEAT
Various Artists
UST RL-405 (twin-pak)
4-track, 7½ ips
\$7.95...68 mins.

This one is designed not only to make you dance, but also to make you like it! They have sampled the best of the "name" bands of eleven labels, and in an outstanding variety of selections have presented various tempos, including waltzes, cha-chas, fox trots, and business men's bounce. Percussion, which seems to be enjoying favor at the moment, finds its way into the titles of a couple of numbers. They are all very foot tapping and danceable.



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

BROADWAY!
Various Artists
UST RL-405 (twin-pak)
\$7.95...69 mins.

This tape offers excellent renditions of 25 show tunes from Broadway, some instrumental, some vocal, played and sung by such artists as Ella Fitzgerald, Mel Torme, Rosemary Clooney, The Trapp Family, Joni James and many others. A well balanced program of hits from the most popular stage shows.



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

MOODS
Various Artists
UST RL-407 (twin-pak)
4-track, 7½ ips
\$7.95...80 mins.

Twenty-six selections are offered here, selected from various albums, and played by "name" bands and orchestras such as David Rose, George Greeley, Andre Previn, John Scott Trotter and many others. They run the mood music gamut from a series of continental romance songs right down to a few jazzy tunes by Dizzy Gillespie and Oscar Peterson. An excellent program of varied musical interest.—F. N. West.



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

THE SECOND TIME AROUND
The Second Time Around, My Favorite Things, Our Language of Love, Romantica, The Twilight Waltz, The Bells of St. Mary's, and others
Jane Morgan
KAPP KTL-41034
4-track, 7½ ips
\$7.95...32 mins.



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

GREAT GOLDEN HITS
All the Way, Tammy, Everybody Loves A Lover, Young At Heart, Anna, April Love, Till, and others
Jane Morgan
KAPP KTL-41036
4-track, 7½ ips
\$7.95...33:45 mins.

The gift of projection, warmth and feeling are evident in all of Jane Morgan's efforts. A sweet melodic voice of considerable depth makes it unnecessary for her to indulge in vocal acrobatics in order to capture her listeners. Instead, she sings straight from the heart, and the result is that you are charmed and captivated—such is Jane Morgan.

Preserve the Genius of the Masters with the



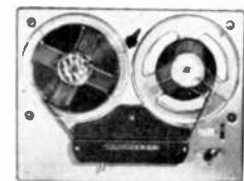
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8 THIRD AVENUE, PELHAM, NEW YORK

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FROM

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MODEL 730



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4 Separate Bass and Treble Control for individual tone preference!
- 

5 Exclusive V-M "Tone-O-Matic" loudness control for tonal balance maintenance!
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6 Pause Button Feature, to secure proper recording level!
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7 Monitor Switch, allows earphone monitoring with speakers OFF!
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- 

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- 

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16 Detachable AC Power Receptacle, with handy lid storage for easy portability!
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17 New Digital Counter, large easy to read numerals, simple reset!
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In "Second Time Around," she concentrates on love songs, and interprets each one with individualistic treatment that makes you feel as though she is singing just to you.

In "Golden Hits," Jane sings a group of popular songs in her warm and intimate style, sometimes assisted by a choral group and ably supported throughout by the rich orchestral arrangements of Marty Gold and Frank Hunter. The recording technique and stereo effects are superb.

Both tapes are recommended for pleasant listening.—*F. N. West.*



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

YELLOW BIRD

Side 1: Yellow Bird, Gigi, An Affair To Remember, The Song of the Rain, Two Different Worlds, Bess You Is My Woman
Side 2: Roger's Bumble Bee, O, Mio Babbino Caro, Marie, Marie, Greensleeves, Forgotten Dreams, A Lover's Symphony

Roger Williams
KAPP KTL 41037
4-track, 7½ ips
\$7.95...36 mins.

Roger Williams again displays his remarkable talents in a group of popular melodies with an international flavor, that will satisfy the tastes of anyone who likes piano playing at its best. Supported by the orchestras of Frank Hunter, Marty Gold and Gene Von Hallberg, his singular piano technique makes every number stand out as he creates 36 minutes of vivid musical portraits.

A delightful tape that Roger Williams fans will be glad to add to their collection.—*F. N. West.*



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

THE RIOTOUS, RAUCOUS, RED-HOT 20'S

30 songs of the 20's era in medleys including such selections as I Love My Baby, Alabama Bound, Yes! We Have No Bananas, The Sheik of Araby, Sweet Sue, Last Night on the Back Porch, Who's Sorry Now, Beautiful Ohio, Girl of My Dreams, etc.

Joe "Fingers" Carr with The Girls From Club 16, The Harmony Boys, and The Wildcat Jazz Band

WARNER BROS. WSTC 1423
4-track, 7½ ips
\$7.95...35 mins.

For those old timers who remember that lost generation known as the Roarin' 20's this tape will bring back nostalgic memories, and for those who know only the Twistin' 60's it will show what the music

of this era was like. As a member of the first group, I can vouch for the authenticity of the performance of Joe "Fingers" Carr and his tin-pan piano as he romps thru a collection of 30 songs in the wild and wacky style of that period. He is assisted in all this madness by the girls from the Club 16 whose high-pitched chirping is typical of the burlesque chorus of that day. The Wildcat Jazz Band bounces around a few Dixieland tunes that are really something to hear. Then there are the Harmony Boys, who vocalize just as it was done on any vaudeville stage in those days.

It's all very fast, furious and funny, and has well recorded stereo sound, something that they didn't have in the 20's.



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

FLAPPERS, SPEAKEASIES, & BATHTUB GIN

Side 1: Charleston, You've Got To See Mama Ev'ry Night, Crazy Words, Crazy Tune and Do Do Do, Chicago, Ma and My Honey's Lovin' Arms

Side 2: China Boy, Painting the Clouds With Sunshine, Looking for a Boy and Revenge, Doll Dance, Bye Bye Blues

Dorothy Provine, Ira Ironstrings, Joe "Fingers" Carr, Matty Matlock, Gus Farney, Eddie Condon & Friends

WARNER BROS. WSTQ 1425
4-track, 7½ ips
\$3.95...25 mins.

This tape is a sampler of Roarin' 20's music taken from ten of Warner Bros. albums and performed by various artists, as listed above.

Some of the numbers on the Joe "Fingers" Carr album are repeated here, and with the additional tunes presented, make a good variety of music of happy days, gone but not forgotten.—*F. N. West.*



Music ★
Performance ★
Fidelity ★★
Stereo Effect ★★

G.I. BLUES

Pocketful of Rainbows, Shoppin' Around, Big Boots, Didja' Ever, Tonight Is So Right for Love, What's She Really Like, and others.

Elvis Presley
RCA FTP-1045
4 track, 7½ ips
\$7.95...32 mins.

An original sound track recording of the songs from Elvis' recent picture displays a somewhat modified style of singing that approaches that of other popular crooners and ballad singers of today. His effort to sing sweetly is aided by the choral background of the Jordanaires. An orchestral accompaniment replaces the old twanging guitar.

If you liked him in his picture, you will probably like this tape of his songs.—*F. N. West*

SHOWS



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

FANNY

Fanny, I Like You, Restless Heart, Never Too Late For Love, To My Wife, Panisse and Son, I Have To Tell You, Religioso, Oysters, Cockles and Mussels, Love Is A Very Light Thing, Welcome Home

Music by Morris Stoloff
WARNER BROS. WSTC 1416
4-track, 7½ ips
\$7.95...32:50 mins.

Movie fans who have seen the film "Fanny" may be interested in this tape, which contains the entire score of the picture based on Harold Rome's music for the Broadway show. The title song, "Fanny" used consistently as a theme, is the one most likely to be remembered, while the rest of his tunes are woven together merely as background music for the rest of the picture. It's entirely instrumental—not one of the stars sings a note. The orchestrations are pleasant in a bland kind of way, well arranged and played by Morris Stoloff, but still sounding like movie background music.—*F. N. West.*

NOVELTY



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

AN EVENING WITH MIKE NICHOLS AND ELAINE MAY

MERCURY ST-6200
4-track, 7½ ips
\$7.95...30:40 mins.

Mike Nichols and Elaine May are a talented pair of entertainers who in a few short years have sky-rocketed to the top as America's leading satirists. Having appeared in many of the leading night clubs as well as guest starring on TV shows, they recently opened in their own show: on Broadway. This tape presents four highlights from their performance in which this delightful pair of wits seize upon human frailments and come up with some of the gol-darndest situations. For instance, a fellow trying to get his dime back from the telephone operator, an amusing sketch on "adultery," a name dropping disc jockey interviewing an actress, and a mother and son telephone conversation are all designed to make an amusing novelty program.—*F. N. West.*

TAPE CLUB NEWS

The Estra "Echo"

The English Speaking Tape Respondents' Association is issuing its own magazine on tape, called The Estra Echo. It is made up of recordings sent to the club by its members. The first issue contained Recordings From the Persian Gulf, by G. Flynn; Christmas Preview, by Ken Lingard; British Clubs Reporting, The South Birmingham Club; Message from the Secretary of Estra; and News From the Midlands, John Rudkin reports.

To obtain a copy of this tape magazine, members either send headquarters a tape with return postage, or a money order to cover the cost of a tape plus postage.

Members are requested to continue sending along interesting taped items to be used in this magazine.

CTRI Cooperates in Radio Broadcasts

Several members of Catholic Tape Recorders, International in the U. S. and other countries will participate in a series of radio broadcasts, "A Nation in Prison." The broadcast is aired weekly over one of the major radio stations in Washington, D. C. and treats mainly the themes of crime and social problems. Director of the program is Rev. Nicholas R. Reid, O.P., one of the Catholic chaplains for the government of the District of Columbia.

CTRI club members will act as correspondents for the weekly broadcast. They will interview notable persons in the field of crime and social problems, using their tape recording equipment.

Round Robins

Members of the Amateur Tape Exchange Association circulate a great many round robin tapes. At the moment three tapes are circulating among 18 members, six to each tape. The tape itself is a most dramatic, yet instructive, story on "Macadam Madness" or "How to Drive and Stay Alive." It is interesting and worth hearing.

Similarly, three other tapes are circulating, each to six members. Basically, the tape asks you to tell what make of recorder you use, why you like it and what improvements you could suggest to the manufacturer. All participants will know the results, which should help them decide what to look for in the next recorder they purchase.

The club is always looking for new ideas for round robin tapes and it urges members to make any ideas they have known.

People-to-People Program Progresses

Harry Matthews, Chairman of the Tape Recording Section of the People-to-People Program, reports that messages have gone out to all known tape groups, requesting their cooperation in this venture in international friendships. Participation of the tape groups by sending news of their international tape exchange activities will help the growth of tape exchange, says Matthews, who emphasizes that sending in such news for People-to-

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
Corlandt Parent, Director
Box 324
Shrub Oak, N. Y.

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

CLUB DU RUBAN SONORE
J. A. Freddy Masson, Secretary
Grosse Ile, Cte, Montmagny,
P. Que., Canada

INDIANA RECORDING CLUB
Maxie Coffman, Secretary
3612 Orchard Avenue
Indianapolis 18, Indiana

MAGNETO-VOX CLUB
J. M. Roussel, Sec.-Exec.
8140, 10th Avenue
Montreal 38, Que., Canada

ORGAN MUSIC ENTHUSIASTS
Carl Williams, Secretary
152 Clizbe Avenue
Amsterdam, New York

STEREO INTERNATIONAL
O. B. Sloat, Director
1067 Flatbush Avenue
Brooklyn 26, N. Y.

TAPEWORMS INTERNATIONAL TAPE RECORDING CLUB
Marion Chism, Co-ordinator
129 South Broad Street
Carlinville, Illinois

THE SOCIETY OF TAPE HOBBYISTS
Ralph Holder, General Secretary
116-06 139th Street
South Ozone Park 36, N. Y.

THE VOICESPONDENCE CLUB
Charles Owen, Secretary
Noel, Virginia

UNION MONDIALE DES VOIX FRANCAISES
Emile Garin, Secretary
886 Bushwick Avenue
Brooklyn 21, N. Y.

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

OVERSEAS

AUSTRALIAN TAPE RECORDISTS ASSOC.
John F. Wallen, Hon. Secretary
Box 970, H., G.P.O. Adelaide, South Australia

ENGLISH SPEAKING TAPE RESPONDENTS' ASSOCIATION
Robert Ellis, Secretary and Treasurer
Schoolhouse, Whitson By Duns
Berwickshire, Scotland

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

People publication does not obligate the participating groups in any way.

New British Club

In June of last year a new tape club was formed in Britain, called World Wide Tape Talk. Its membership has been increasing steadily and it now has members in America, New Zealand, South Africa, Arabia, Malta, Germany, Holland, Wales, Scotland and, of course, England.

Only a small fee is made to home members in order to cover printing, clerical and postage expenses, but no fees are made to overseas members, although local mint stamps of any value would be appreciated.

First and foremost, this club is for the benefit of tape recorder owners who wish to put their instruments to the fullest, most exciting use, through the exchange of taped messages. If, in the course of individual contacts, fellowship and greater understanding are spread between the peoples of all nations, then this is the ideal of "World Wide Tape Talk."

Membership forms will gladly be forwarded to any person interested in joining. Write to C. L. Towers, Secretary, World Wide Tape Talk, 35 The Gardens, Harrow, Middlesex, England.

Irish Associate Club

The Indiana Recording Club started an Associate Club program last year when it became affiliated with the Bristol Tape Recording Club and then the Association of South Africa Clubs. The list of Associate Clubs has steadily increased and the Irish Tape Pals Association was recently welcomed to the list. ITP has members in Ireland, Australia, India, New Zealand, England, Canada, South Africa and the U. S. A.

Until the Indiana Recording Club can publish the names of these new members of ITP, club members may contact the Organizing Secretary, Eddie O'Neill, 12 Mayorstone Park, Limerick, Ireland.

Three copies of the newsletters published by Associate Clubs are received regularly by IRC and are available to club members.

Recordings for Radio Broadcast Wanted

The Magneto-Vox Club, listed in our roster, invites recordists from all over the world to send them recordings for possible use on their "Tape Club of the Air" radio program. Participants of this program, which is in English, can be members of any tape club organized in the U. S., Canada or overseas.

The recordings can be anything that is not commercial and already copyrighted, such as reports, sound effects, singing or music, animals, birds, candid recordings, etc. Tapes will be returned after broadcast and the recordists will receive a copy of the broadcast if they supply a tape for copying.

Recordings may be three to five minutes in length (7½ ips on a 3" reel), but those of special interest may be a little longer. Thirteen programs of 15 minutes each will be broadcast. Club secretaries are invited to send in taped news of their activities too, as well as schools.

Check our roster for the address of Magneto-Vox Club.

ENTERTAINING?



THIS TAPE FUN KIT CAN BE THE HIT OF YOUR PARTY

The Tape Fun Kit is composed of whimsical, hilarity provoking, laugh-filled skits, all of which are designed primarily for fun—and lots of it. Each skit is short and each has a script for every character called for.

10 SCRIPTS INCLUDED

Kit No. 1 contains ten scripts—all different—all amusing. These skits are excellent for affairs where a goodly number of party-goers are present. Everyone has something to say and he or she can say it as his imagination interprets it. The ten scripts encompass 26 different characters, 14 male and 12 female.

TAPE KIT NO. 1—\$2.00

Order yours today. Use the handy form below.

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Severna Park, Maryland

Please send me Tape Fun Kit No. 1. I enclose \$2.00. Send First Class. I enclose 24c additional.)

Name

Address

City Zone State

TAPEPENDENTS 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: TAPEPENDENTS WANTED, Tape Recording Magazine, 101 Baltimore-Annapolis Blvd., Severna Park, Md.

F. Wayne Ashworth, WSTP Radio, Box 157, Salisbury, N. Carolina; Recorders: V-M 720, 3 3/4 & 7 1/2 ips, quarter track—Revere 1120, 3 3/4 & 7 1/2 ips, dual track—Ampex 601, 7 1/2 ips, single track; Interests: Amateur Radio, Religion, Music, Photography, Travel, World Affairs.

Albert Schrib, 2030 S. Gilpin, Denver 10, Colo.; Recorder: Knight (KN 4075), 1 7/8, 3 3/4 & 7 1/2 ips, 4 track stereo; Interests: Psychology and hypnosis.

Richard H. White, 24 Stillwell Road, Franklin Park, New Jersey; Recorder: Sony, 3 3/4 or 7 1/2 ips, quarter track; Interests: Music, Photography, High Fidelity; Adult, 34, single.

Jerry Lipman, 1750 Rivera St., San Francisco 16, Calif.; Recorders: Webcor-Regent & Sony 262-SL, 1 7/8, 3 3/4 and 7 1/2 ips, 4 track; Interests: Researching Dublin-born composer, Michael William Palfe. Also interested general tapespondence; Adult.

George DiSylvestro, 717 Florence Drive, Park Ridge, Illinois; Recorder: Wollensak, 3 3/4 & 7 1/2 ips, dual track; Interests: Wants to trade or exchange American Foundrymen Society technical meetings or foundry educational subjects and salesmanship training tapes.

Roger Feinquad, 2055 Cruger Ave., Bronx 62, N. Y.; Recorder: Voice of Music 722, 7 1/2 & 3 3/4 ips, 4 track stereo; Interests: The art of conversation, Music, almost all topics, Teenager.

Lawrence A. Sharpe, P. O. Box 713, Chapel Hill, North Carolina; Recorder: Sony 101, 7 1/2 & 3 3/4 ips, dual track; Interests: Wants copies of old (not now on air, not necessarily too far back) soap operas and other old radio programs. Has language laboratory equipment at his disposal for making copies. Also interested in exchanging language tapes; Adult.

Louis Berger, 1751 E. 67th St., Chicago 49, Ill.; Recorders: Wollensak, Revox, Sony Stereorecorder, 7 1/2 or 3 3/4 ips, dual track; Interests: Sound effects, collector's items, comedy, entertainment. Have 10 year collection in 571 reels which includes selected musicals, dramas, voices of celebrities, old and current; Adult.

Sam Bergstein, 43-40 Union St., Flushing 55, N. Y.; Recorder: Bell tape deck, 7 1/2 or 3 3/4 ips, mono dual track or 2 track stereo record; Interests: Dixieland, Big Band Swing, Dance Bands; Adult.

C. B. Hagen, Geography Dept., UCLA, Los Angeles 24, Calif.; Recorder: Ampex 960, 3 3/4 or 7 1/2 ips, full, 1/2 or 1/4 tracks; Interests: Historical-political recordings, speeches of statesmen and famous men, historical events, political and propaganda songs, marches and music, wartime recordings; Commercials and jingles; Music of Carl Orff not on commercial records; Nature and civ sounds, ambient and background noise recordings; Adult.

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 7/8 & 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 Bruegmann, 94 Mountview Avenue, Toronto 9, Ontario, Canada; Recorder: Grundig TK-45, 1 7/8, 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 7/8, 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. Saffin, 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 7/8, 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 7/8, 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 Linden 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. Kyod, 70 Congress Avenue, Shelton, Conn.; Recorder: Webcor, 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, 3/4 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 7/8, 3/4 and 7 1/2 ips; Interests: Travel, sports, bowling, golf, baseball, football, cooking, music, general conversation; Adult—respond 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. Engolhardt, 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, 3/4 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, 3/4 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, Blauevelt, 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 EUB 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 Bary, 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 Brønner, 215 Louvaine Dr., Kenmore 23, New York; Recorder: Norelco, 1 7/8, 3/4 & 7 1/2 ips, dual track; Interests: Religion, recorders, diabetes, general topics; Adult.

Mr. 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 7/8, 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, Sruzzi 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; Interest: 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 7/8, 3 3/4 & 7 1/2 ips; Interests: Exchange of Metropolitan Opera Broadcasts, Looking for good copy of: "Romeo & Juliet," Bioerline 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 Reverses, 1/2 and 1/4 track, 3 3/4 and 7 1/2 ips; Interest: Would like to exchange with persons having a love for organ music. Will answer all tapes sent; Adult.

Jacquelin Terns, 1936 Venice, Deatborn 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.



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by C. J. Le Bel, Vice President
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A complete handbook of tape recording containing 150 pages of up-to-the-minute information of practical value to every tape recordist. Easy reading for the most inexperienced of home recordists.

Sections include: How A Tape Recorder Works, Characteristics of a Tape Recorder, Selecting A Tape Recorder, Selecting A Recording Tape, Using the Tape Recorder, Making A Microphone Recording, Acoustically Treating the Studio, Tape Editing, Binaural or Stereophonic Recording, Putting Together A Recording Show, and a Glossary of Tape Recording Terms.

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Richard F. Dubbe

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If not satisfied, return books within 5 days and money will be refunded.

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

Where Can I Get Recorded Tapes?

To the Editor:

Just received the February issue. Wrote you two months ago about your New Tapes Section. Why publish it?

We are long time dealers. Have calls for high class recorded tapes.

But WHERE is the clearing house or firm from whom we can order? Can get any of the tapes as issued?

Will you make that clear, please. Such a mismanaged, blundering, half-dead mess it is. Tapes to sell—but please don't order? ? ?

Print the address of supplier of each and every tape you describe and thus spread the use of worthwhile material. Create demand.

And, we use and can play 2 track mono or stereo on our Model 290 Ekotape.

Why are two-track tapes not announced? We cannot play 4 track on our hi-fi, 13 tube, high class recorder. John Kadletz, Chatfield, Minn.

For the benefit of you and other readers who might be in a similar fix we append below the sources for tapes of which we know. Two track tapes are available from only a few sources and it might pay you to install a four-track head in your recorder to take advantage of the lower cost of four-track tape. The firms who are producing recorded tape should be advertising it in this and other publications but they do not seem to be doing so.

Dealers may obtain tapes of the large record companies, i.e., Capitol, Columbia and RCA through the local distributors of those lines. They make no sales direct to the consumer. Most other lines are carried by United Stereo Tapes but in four-track form only.

United Stereo Tapes distributes for the following firms: ABC-Paramount, ATCO, Audio Fidelity, Col-Pix, Command, Coral, Decca, Elektra, Grand Award, Kapp-Medallion, London, MGM, Reprise, Richmond, Roulette, Seeco, Tico, Time, Ultra Audio, United Artists, Vanguard, Verve, Warner Bros., Westminster and World Pacific. Their address is 88 Llewellyn Ave., Bloomfield, N. J. They will supply consumers with the names and addresses of the nearest dealer handling the line. Their catalog lists about 800 four-track tapes.

Of the independents, Bel Canto at 6325 Huntley Road, Columbus 24, Ohio, and Livingston Audio Products, 1259 Rt. 46, Parsippany, N. J. issue both two and four track tapes. Catalogs are available on request.

Another independent is Concertapes at PO Box 88, Wilmette, Ill.

Tapes may be ordered directly from the independent firms, they do not have distributors as do the major companies, with the possible exception of Bel Canto. A letter

sent to the companies should bring forth the needed information.

As you mention in your letter, ordering the tapes and getting them seem to be two different things. We have heard reports of long delays in shipment and can understand your concern at the apparent lack of interest on the part of the distributors.

Because of the varied pattern of distribution of the various lines of tapes it would not be feasible for us to attempt to print the addresses of the firms in the reviews since, in many cases the tapes cannot be obtained from the companies themselves but only through their distributors.

Educate the Public?

To the Editor:

Noting Mr. Laughlin's letter in February's FEEDBACK section of your fine publication, I have a suggestion I hope the ad men of the larger manufacturers will take into consideration. It is true that the mass of the public is entirely unaware of tape advantages over disc, and merely expects a recorder to be used to preserve "baby's first words." I have become increasingly aware of this through personal conversation with friends, and have been a source for enlightenment; however, undoubtedly neither myself nor any other single person could ever successfully take upon the responsibility of educating the public. Obviously the only manner which our knowledge could be transferred to the public would be by a highly influential medium—television.

I am quite sure that portions of the tape industry would be willing to buy time on various programs, or even purchase programs outright for telecast. Ampex, 3M and other giants could foot the bill easily enough. And it most certainly would increase the overall sales of equipment and of course, pre-recorded tape. This would mean, to the satisfaction of some frustrated stereo tape addicts, that the selection of tapes available would greatly increase. All manufacturers may eventually release them simultaneously with their disc counterparts. At any rate, it is something that should be tested, as I am confident it will prove beneficial.

In this respect I have one small gripe; It seems that many manufacturers of tape recording equipment furnish entirely inadequate instruction booklets. I have quite often been called upon by a friend who, even after studying the manufacturers directions, could not operate their recorder. I find moreover, that few concerns ever mention the fact that this instrument's heads must be cleaned periodically. It is no wonder that disillusioned owners have been puzzled by the ever increasing distortion on their equipment. If tape is ever to directly compete with disc, or to even attain any sort of reputation in the public eye, this bug, and any others easily remedied, should be eliminated. — Eugene Steinberg, Brooklyn, N. Y.

INDUSTRY NEWS

LOS ANGELES HIGH FIDELITY MUSIC show will be held at the Ambassador Hotel from March 20 through the 25th. According to Raymond V. Pepe, IFHM president, a committee on the west coast has been appointed to handle all show details.

THE DINERS RECORD CLUB is planning to launch an all-label tape club. All tape offerings will be 4-track reel to reel. At present the club is being promoted through direct mail.

MINNESOTA MINING AND MANUFACTURING has announced that the Minicom operation has been accorded full divisional status because of its fine growth record over the last five years. The division is under the direction of Francis C. Healy, one of America's tape pioneers. The division, which was formerly Bing Crosby electronics, manufactures precision instrumentation units.

AMELUX ELECTRONICS, New York is marketing the Swedish Luxor tape recorder. The unit is a four track stereo machine and is designated the Magnefon. The machine has three speeds, 7½, 3¾ and 1⅞ ips.

ANDREW LORANT has resigned his position as ad manager for Bell Sound, a position he has held for the past five years.

THE MAGNETIC RECORDING INDUSTRY ASSOCIATION has appointed an 11-man standards committee.

The committee will be headed by John Ihrig, executive vice-president of Webcor, Inc., Chicago. Sam Romano, Webcor Engineering vice-president will serve as vice chairman.

According to K. L. Bishop, president of MRIA, the standards committee will be comprised of the heads of 11 sub-committees, each dealing with quality control of a specific aspect of tape recorders.

The sub-committees and their chairmen will be as follows: Frequency Response, Bob Rhoades, V-M Corp., Benton Harbor, Mich.; Distortion and Signal to Noise, G. Brown, Telectrosonic Corp., Long Island City, N. Y.; Wow and Flutter, Speed Tolerance, Ray Smith, Magnetic Products Division, Minnesota Mining & Manufacturing Co., St. Paul.

Power Output, L. Noedtveldt, Tandberg of America, Inc., Pelham, N. Y.; Stereo Characteristics, J. J. Gavin, Bell Sound Division, Thompson Ramo Wooldridge, Inc., Columbus, O.; Head Characteristics, J. Hogan, The Nortronics Co., Inc., Minneapolis; Standard Reproducing Characteristics, W. Austin Ellmore, Ampex Corp., Sunnyvale, Calif.

Head Dimensions, Leo Page, Michigan Magnetics, Inc., Vermontville, Mich.; Track Dimensions, C. J. Le Bel, Audio Devices, Inc., N. Y.; and Tape & Reel Dimensions, A. P. Hultgren, American Molded Products Co., Chicago.

The 11th sub-committee of the MRIA standards group will cover FM stereo. The head of this group has not yet been named.

The section will work to develop standards assuring complete compatibility of magnetic recording equipment with FM stereo adapters.

AGFA has named Maria A. Curry to establish a magnetic tape section within the company's industrial sales division in New York. Miss Curry is a graduate of the Radio Technical Institute of the Museum of Technological Trades in Vienna where she specialized in audio techniques and data recording.

ROBERTS ELECTRONICS has appointed Bill Mullen, regional sales manager, headquartered in Chicago. Mr. Mullen is an old timer in the tape field having served as a field management representative for Ampro and Pentron.

AUDIO ENGINEERING SOCIETY has issued a call for papers to be presented at the Technical Sessions of the Society's Ninth Annual Spring Convention at the Ambassador Hotel, Los Angeles, March 21 through 23rd. It is being held in conjunction with the High Fidelity Manufacturer's Show which runs for six days from March 20 through the 25th. Titles and a short abstract should be sent to: Mr. Wm. H. Thomas, Chairman, AES Spring Convention, c/o James B. Lansing Sound, Inc., 3249 Casitas Ave., Los Angeles 39, Cal.

COLUMBIA RECORDS has formed a four-track stereo tape club with headquarters in Terre Haute, Ind. The club will be operated along the lines of the record club where the purchase of so many tapes entitles the purchaser to one free.

IRVING ROSSMAN, long president of Pentron, Chicago has resigned that position. Osborne Andreas, board chairman, will take over as president pro-tem.

SONY is working to develop home video tape recorders but the firm feels that a number of years will elapse before improved methods and lower prices will make the units feasible for home use.

WEST GERMAN tape recorder manufacturers have given the cold shoulder to the German composers association in their efforts to collect a payment for taping music—even music played at home. The association was recently given a court decision that said in effect that the mere ownership of a recorder was evidence of intent to tape music. With this in hand the attorney for the composers sought the help of the manufacturers in order to implement the decision. They couldn't have been less interested. The composers association seeks to collect about \$2.50 annually from every recorder owner.

THEODORE S. BRISKIN, vice president and general manager of Revere has announced he is resigning to take up residence on the west coast. He will remain as a consultant for several months to make the changeover easy. G. J. Wacholz, who has been acting as vice president since 3M purchased the firm will take over the duties of president.

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1200' MYLAR, 1 1/2 mil. (Strong) 1/2"	1.68
1800' acetate (plastic), 7"	1.75
1800' MYLAR 1 mil. thick, 7"	1.95
2400' MYLAR, untempered, 7"	2.68
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"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.

Gentlemen:

My recorder is important to me because it enables me to read taped works of literature which are not available to me in any other way. It is interesting to hear someone read a book by tape and know when they get out their Zippo lighter and light a cigarette. The lighter has a certain sound and can be recognized by anyone who has a memory for sounds of things. One also wonders if the dog that is heard belongs to the reader or to an annoying neighbor.

I had an old chime clock which had a very clear set of chimes. It got like Coolidge and didn't choose to run and since it would cost almost as much to have it cleaned and put in order, I decided to get a new one. I recorded the chimes of the old one and also the chimes of the new one which we got for our 15th wedding anniversary. Now I will always have the chimes of that old clock.

I have also been able to preserve some of my deteriorating 78RPM records. It is nice to go into the oasis of good music at times to get away from the degenerate stuff that has come out since the war.

I have a summer shower that has the voices of my great nieces in it along with other sounds around the house and they may be nice to play to the girls' boy friends some day.

How about recording your friend's heartbeats and comparing them. I could do that and in that way could give a brief talk as to how different heart troubles sound.

I have been able to hear the sounds of New York traffic and have the sounds of voices of friends in my mind because of voicerecording by tape. Through the Voicerecording Club library, I have secured the sounds of steam locomotives and can enjoy them although they have vanished from the face of the earth.

When Secretary Charles Owen and his wife Melva visited us about a year ago, I recognized him immediately by voice although I had never met him or his wife.

This is merely the surface of what recorders will mean to me in the future and there will always crop up new ideas and situations where the recorder will be of some advantage. Imagine my disappointment one evening when the neighbors were having a big fight and my recorder was in the repair shop!—George A. Holben, Canton, Ohio.

Gentlemen:

My great grandfather had no so-called modern conveniences at all. My grandfather might have talked on a telephone, but most likely did not. My father never saw a TV.

But to his son, now is available all the modern, marvelous inventions of which one of the greatest is tape recording. One of my regrets is that I could not record the voice of anyone in the past generation. It seems like a recording of a voice is as important as a photograph. My own children have grown up without a recording of their comical expressions, but grandpa is now making up for lost time and it is keeping him young.

My first interview with my granddaughter was on wire. She felt very grown and was acting very dignified. I was asking her about her school work and which subjects she liked: "Do you like mathematics?" I saw the word was not in her vocabulary so I said, "Do you add and subtract and things like that?" "O, yes, we had adders a long time ago." "About how far have you advanced; have you had division, fractions, decimals and square and cube root algebra and geometry, trigonometry, logarithm; also, what is your opinion of calculus?" A puzzled expression left her face as she said, "I think Cal is cute, I like his curly brown hair and I am going to marry him some day, but I never knew his last name before."

Another granddaughter I asked how long she had been going to school and she said I think about a thousand years.

I have a grandson who started some time before Christmas to play the flute. At Christmas time he laboriously played a Christmas song, and he was asked how long he had been playing the flute and, to the astonishment of all, he said about fourteen years. "And how old are you now?" he was asked. "Well, I don't know but I think I am eleven."

I do many other things with my recorder but it's ability to reproduce sound verbatim without distortion makes it important to me. —Arthur Brooks, Canton, Ohio.

Dear Sirs:

Although I am only 14 years old, I have a tape recorder which is of great importance to me because:

I can practice for speech and English class, and other school courses. I also use it for enjoyment. I tape record off television and radio. I would therefore say my recorder, although it only uses a 5-inch reel and is not stereo, plays an important part in my life.—David Mayer, 3709 Brighton Rd., Fort Worth, Texas.

Dear Sirs:

"Why My Tape Recorder is Important to Me."—Because it is the only way I can hear music from North America, thus providing me with my only entertainment here in the Middle East.—S F 99986 CFN Masse, J. A. C. A. P. O. 5049 R. C. E. M. E. U. N. E. F., Middle East.

TAPE IN EDUCATION

Robert C. Snyder

WHILE much has been written as to the value of making in-school recordings, not too much has been forthcoming on the problems of overcoming the poor acoustic qualities of most of the classrooms in use today.

In the modern schools, the janitor has been favored to the extent of tile wainscoating and hardwood floors, both of which are easy to keep clean and can take the beating given them by the succeeding generations.

Likewise, the modern concept is to have acres of windows which means well-lighted classrooms and less eyestrain.

Both of these things are definite improvements in educational facilities but both of them increase rather than decrease the problems of making a good recording.

Since the room is so shiny and hard on both floor and walls, it will actively reflect any sound, just as a cliff face reflects the shouted voice and produces the familiar echo.

The echos from the floor, windows and walls will be reflected back to the microphone and, in severe cases, will actually interfere with the intelligibility of the recording being made. The problem is how to get rid of the unwanted reflections.

One way to cut down on sound reflections without altering the room in any way is to work the microphone up close. The increased volume of sound available because of the close miking will tend to drown out the reflected sound and, because the recorder volume will be turned down, the weaker sound reflections will not make much of an impression and are likely to go unnoticed.

By a bit of experimenting, placing the recorder in various positions in the room, you can locate the spot where the sound echos are least bothersome and use that for your recording corner.

If the room is equipped with drapes for audio-visual purposes, such as drapes that are used for room darkening, these may be closed over the glass windows to eliminate reflections of sound from that source.

There is little that can be done in practical fashion about the walls, blackboards and floors, most of which are excellent sound reflectors.

But you can easily create a good facsimile of a recording studio by using blankets, heavy curtains or similar materials. These are draped over a frame of wood or metal which the class can knock together, or perhaps, if your school has a shop, the wood-working classes can make the frames for you.

When the cloths are attached to the frames by means of tacks or thumbtacks you will have created a small room with practically "dead" sidewalls. This will effectively cut down on reflections by eliminating the propagation of sound to the room in general and by preventing any echos from striking the microphone.

The top is left open for the admittance of light and air. A small throw rug placed underfoot will further cut reflections and this might be considered as "nice, but not necessary."

It is not necessary to make a four-sided enclosure, three sides should prove adequate.

The microphone may be placed on a small table, or, better yet, on a microphone stand and the recorder placed outside the enclosure if possible. The microphone should face one of the walls of the enclosure rather than the open end. This will place the dead side of the mike toward the source of reflection and make for a cleaner pickup of the sound.

Such preparations for a recording session do not take long and they are valuable, not only in providing a better recording, but if the reasons for the preparations are explained to the class, they will learn something about the nature of sound itself.

If the recording is done from a prepared script (and this is most certainly the best way) then the students who are making the recording can be taught the technique of script reading.

This consists, principally, of saying what you just read while scanning ahead to see what you have to say. This technique can quickly move a reader from the plodding stage to being able to get some expression into what is being read. Needless to say, one or more rehearsals should be held if the recording is an important one.

Paper rattling during recording is picked up by the microphone far out of proportion to the sound as heard by our ears. In script reading for radio, the papers are slid noiselessly to one side, if the seated position is used.

If the person is standing, the top sheet which has been read is slid off to one side and allowed to drop to the floor and the sheets are not picked up until the session is over. This last method always makes a hit with children—not only are they allowed to litter the floor but encouraged to do so.

Another small point which improves script reading is to slide the top sheet downward so as to reveal the top lines on the next sheet before sliding it sideways and off onto the pile or the floor. This permits continuity of scanning ahead and makes the transition from one page of script to the next both easy and smooth.

One or two actors are easily encompassed within the microphone beam of the kinds of mikes usually supplied with recorders. If more actors are required, then the microphone should be laid on its back and the actors grouped around it.

Many of the factors that go into making a good recording seem to be so small and detailed that they are hardly worth bothering about but they make a big difference.

Ambient noise in the classroom is usually of a fairly high level and the group should be cautioned to be quiet while the recording is being made.

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.

TAPE Recording Magazine was the first and is today the foremost publication in Europe in this field.

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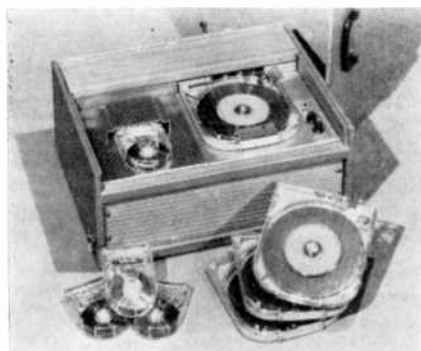
NEW PRODUCTS

NEW SWEDISH RECORDER



The Luxor Magnefon MP-410-A stereo tape recorder from Sweden has been introduced to the American market by Amelux Electronics Corp., 60 E. 42nd St., N. Y. This machine can be used to record and play back in two track stereo or four track monaural from phono, microphone, radio, etc. It can also record and replay two programs simultaneously on two separate tracks, one from radio and one from microphone. Its features include: two tape heads, two preamplifiers, two power amplifiers, two magic eye recording level indicators, one for each channel, and two built-in stereo speakers with separate volume controls for balance. It also has outlets for external amplifiers and speakers, and inputs for all sound sources; one switch for play, fast forward and fast reverse; one switch for all three speeds; a fool-proof interlock to prevent accidental erasure; easy to read numerical cuemeter; and all controls are on the top for operating ease. The recorder is available in a Swedish modern, hand rubbed wooden base of mahogany and is made by the Luxor Industri AB, one of Scandinavia's largest manufacturers of electronic equipment. For complete details and price, write to Amelux.

COUSINO COMBINATION



Cousino Electronics Corp., 1941 Franklin Ave., Toledo 2, Ohio, has announced a versatile new combination long-play background music cartridge tape player and message repeater. This combination provides automatic interruption of the background music for voice message broadcast at pre-selected intervals. The new Model LPM-2666 will feature the Echo-Matic con-

tinuous magnetic tape loop cartridge along with a new two-hour friction-free music cartridge. The long-play cartridge section at the right provides music playback only, the left section provides both record and playback functions for on-the-spot voice recordings. The unit is designed for convenient plug-in attachment to existing public address installations. A teaching machine version of this new unit provides for continuous recording of both the master material and the student's response on a short tape loop in the smaller Echo-Matic cartridge during playback teaching use of the long-play cartridge. A single operation stops the larger cartridge and switches the smaller cartridge from record to playback, instantly repeating the word, phrase or sentence recorded on the loop. All details are available from Cousino.

VERSATILE WEBCOR



Webcor, Inc., 5610 W. Bloomingdale Ave., Chicago, Ill., has introduced a versatile, low-priced recorder. This new unit is called The Statesman and it is priced at \$79.95. The recorder features dual track recording at two speeds— $3\frac{3}{4}$ and $7\frac{1}{2}$ ips. It plays three inch, five inch, and seven inch reels. The fully portable unit weighs only 14 pounds, includes a hand-held wide-range microphone, roomy cord storage space, and it is very simple to operate. A single lever performs most functions. For more information on this machine, write to Webcor.

STATESMAN STEREO 4



International Products Co., 1289 South La Brea Avenue, Los Angeles 19, California, is now marketing the new Statesman Stereo 4 recorder. This machine is multiplex ready. Self contained, it will both record stereo and playback in stereo through its own built in speakers and amplifiers. It weighs only 28 lbs., has simplified push button controls, and professional VU meters. It will give eight hours of recording time on 7" reels and it features speeds of $7\frac{1}{2}$ and $3\frac{3}{4}$ ips, automatic tape lifters, tone control, constant speed hysteresis motor, digital tape counter, two full range dynamic microphones, two 4×6 oval dynamic speakers, auxiliary inputs and outputs, accessory storage compartments, and sound deflecting baffle wings. It comes complete with tape, reels, patch cords and microphones. The cost is \$249.95. All details are available from the manufacturer.

STEREO FM RECEIVER



A new and compact stereo FM receiver, the Knight KN-310MC, has been announced by Allied Radio of Chicago. Housed in one compact cabinet are a stereo FM tuner with a transistor/nuvistor circuit, a 40-watt all-transistor stereo amplifier, and a built-in automatic clock-timer. Only a pair of speakers need be added to this unit to form a complete hi-fi system for reception of the new stereophonic FM broadcasts recently approved by the FCC, as well as conventional FM programs. The clock-timer will automatically turn the receiver on and off at pre-set times. Unit has simple plug inputs for adding any source of music—stereo record changer, tape deck, etc. It has a dark brown textured case and the front panel is of polished brass. The Knight KN-310MC is priced at \$254.50. Information free on request from Allied Radio, 100 N. Western Ave., Chicago 80, Illinois.

BOOKLET ON 4-TRACK RECORDING

A booklet describing four-track tape recording has been published by Minnesota Mining and Manufacturing Company, maker of "Scotch" brand magnetic tapes. The booklet is a non-technical description of the method and its benefits. The pamphlet also lists available "Scotch" brand tapes and accessories, and gives hints on the care and storage of tape. Copies of the booklet may be secured from "Scotch" brand tape dealers, or by writing Dept. Y1-522, Minnesota Mining and Manufacturing Company, 900 Bush Avenue, St. Paul 6, Minn.

Recording Musical Instruments

. . . how instruments are recorded depends upon where the sound comes from.

NO two kinds of musical instruments are alike, either in appearance, tonal range or loudness. These inherent differences in the instruments themselves likewise mean that the same kind of recording setup cannot be used for all.

Of course, it is possible to make a recording of the sound of the instrument by placing the microphone almost anywhere in the same room with the instrument but the recording will not be the best that can be made, nor will such a pickup truly be representative of the instrument.

In addition to these variations, the room surroundings will add or detract from the quality of the recording. Despite these apparent difficulties, the problems encountered are easy of solution so there is no real reason why a topnotch recording cannot be made.

General Considerations

Basically, the solution to most musical instrument recording problems lies in determining where the sound comes from. For instance, in a cornet or trumpet, the sound comes directly from the bell of the instrument, in a piano, the sounding board to which the strings are attached is the chief source, in an accordion it is the reeds and the sounding board to which they are fastened, etc. So simply by analyzing the instrument in terms of sound production you get a big clue as to where the microphone should be placed.

The volume of sound produced by the instrument is another general determining factor. An instrument that has low volume will require closer microphone placement than one of high volume. The type of instrument will make a difference also. For instance, the percussion instruments, such as the bass drum or the kettle drum, send out a tremendous wave of low frequency sound that requires a more distant pickup than, say, the bowed strings of a violin. The crash of cymbals will also have to be treated differently than the same cymbal tickled with a wire brush.

So the points to consider in regard to any instrument are these: 1—Where the sound issues from the instrument, 2—the loudness of the sound, 3—whether it is percussive or not.

Room Acoustics

The room in which the recording is made will have a definite effect on its quality. To take an extreme, a recording made in an extremely live room, such as a gym where there are hard polished surfaces all around, will reflect the sound back to the microphone. These reflections can be of such intensity that they actually interfere with the desired sounds and cause distortion. This is particularly true of instruments which are heavy in the bass range.

If recording must be done in a room with live charac-

teristics, then the microphone should be placed as close as possible to the instrument so that the sound reflections will be minimized and the true tones predominate. The microphone should not be so close that the tones of the instrument are distorted by being too loud so that it blasts the microphone.

The ideal type of room should have a certain amount of liveness but not too much. A totally dead room will provide a clean recording of an instrument but it will lack some of the brilliance and sparkle that just a mite of reflection gives.

Fortunately, the average room is generally quite suited to recording purposes and by means of a few trials in different spots of the room, the degree of liveness desired can be obtained.

If a room is too live, it may be deadened by hanging blankets or drapes along the walls and by putting a carpet on the floor.

Extraneous noises should be held to a minimum by selecting a quiet room in which to make the recordings.

In the balance of this article we have attempted to present in capsule form the name, characteristics and suggested microphone placement for most of the recognized musical instruments in use today. These recommendations are based on average home conditions, not on studios where there is room to make a distant pickup of a grand piano with the mike 30 feet away from the open lid and 15 feet from the floor.

Regarding the placement of the microphone itself, it is best placed on a microphone stand, if one is available. These stands are relatively inexpensive and permit the mike to be raised and lowered or tilted as necessary. A camera tripod can be made to serve as a substitute, but a mike stand is a good investment.

If the microphone is set on a table or other support a few folds of cloth or a piece of sponge rubber may be placed under it to dampen any vibrations which might be present in the supporting surface. Needless to say, it should not be placed close to the recorder where motor noise and vibration might be transmitted to it.

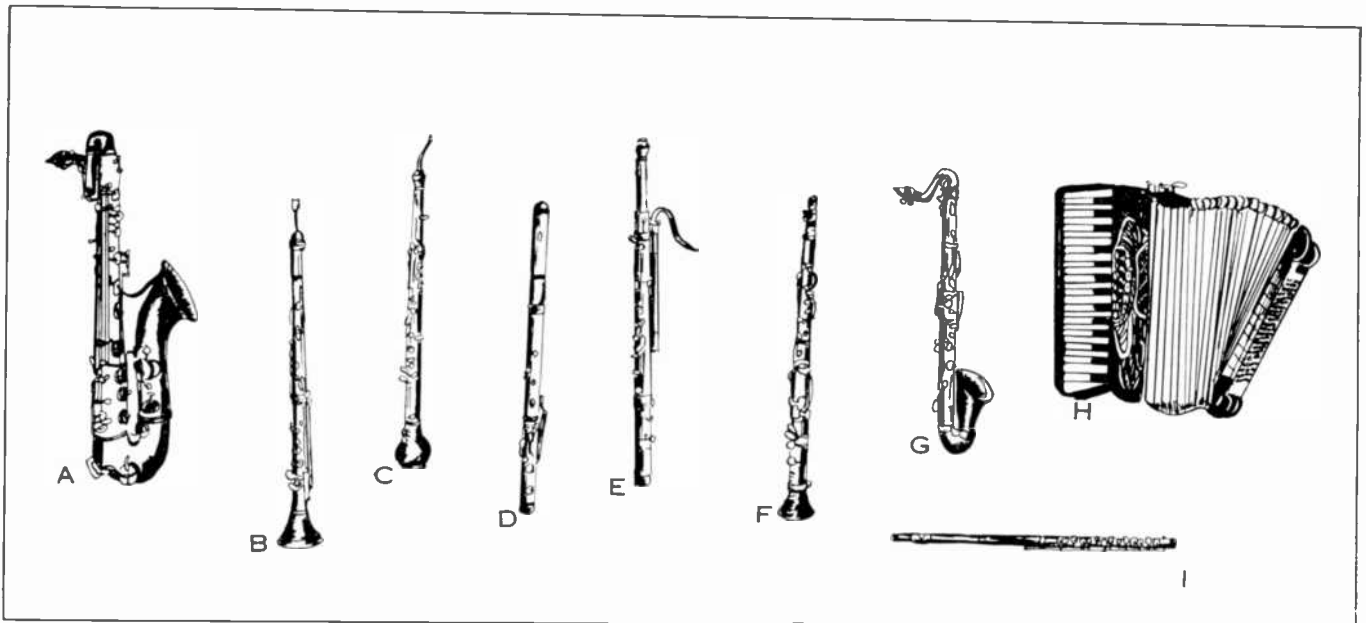
WOODWINDS

Clarinet

Sound Source: vibration of the column of air within the instrument created by blowing through a reeded mouthpiece. Tones are created by opening and closing holes along length of instrument. Much of the sound will emerge through these holes.

Microphone Technique: the clarinet should be held about two feet from the microphone with the tube in a horizontal position across the mike pickup beam. If low tones do not

WOODWIND INSTRUMENTS



A. Saxophone B. Oboe C. English Horn D. Old Flute E. Bassoon F. Clarinet G. Bass Clarinet H. Accordion I. Piccolo

have enough volume shift position of instrument so that the low tones are favored. This is for most normal solos. For hot, jazz type playing, mike should be five or six feet from instrument with the bell pointed toward the mike. For subtone effects which are created by a combination of lip movements and damped reed vibrations, the mike should only be about six inches from the instrument. When the mike is approached closely the beam is very narrow and it may be necessary to move back and forth while playing so that the hole emitting the sound is close to the center of the pick-up beam. Keep alert for possible distortion of sound when working microphone at close distances.

Bass Clarinet and Bass Horn

Sound Source: belongs to the same family as the clarinet although in appearance it resembles a saxophone. A reed vibrates the air column in the bore of the instrument which has holes along its length to alter the pitch. The end is curved into a bell.

Microphone Technique: Make pickup at least two feet from the bell of the instrument, which should be played without raising the bell. A nearer placement will result in distortion of the low tones of the instrument. At the same time, it should not be placed more than four feet from the mike or the bass tones will be lost and the fullness and definition will suffer.

Flute

Sound Source: sound chamber within hollow metal tube. Tones come from openings along length of tube. Vibrations produced by blowing through metal mouthpiece which breaks air across sharp outer edge of opening.

Microphone Technique: high, penetrating tones may distort if too close to mike. Keep back at least two feet, more may be necessary. Air rushing across sound producing hole

should not be audible in recording. The mike may be placed below the level of the instrument to aid in eliminating air sound.

Piccolo

Sound Source: same as flute noted above and subject to the same types of distortion if too close to the mike.

Microphone Technique: Keep at least three feet from microphone because of tendency of high tones to distort. Instrument should be held across pickup beam of mike.

Oboe

Sound Source: reed mouthpiece projecting air passage through conical tube expanding away from mouthpiece. Sound is produced through vibration of the air in the tube. Sound emanates from bell and holes on body of instrument. Tones are nasal, thin and loud.

Microphone Technique: Since the tones of the oboe are loud, the exact position in relation to the microphone is not critical. The distance may be varied from three to five feet without affecting the tone quality. The instrument should be held with the cylinder slightly inclined, the bell down and the holes facing directly toward the center of the pickup beam.

English Horn

Sound Source: the English horn is an oboe but half again as large so its tones are deeper. It is not a horn but has been named for the old shepherd's pipe known as the hornpipe.

Microphone Technique: The same technique as is used to record the oboe should be used with the English horn except that the distance from the microphone should be decreased.

Bassoon

Sound Source: the air is vibrated by being blown through a reeded mouthpiece which feeds into a tapering tube which doubles upon itself. It bears the same relation to the woodwinds that the stringed bass does to the strings.

Microphone Technique: the volume of sound produced by this instrument is fairly low. For recording it should be played about two feet from the microphone. The larger contrabassoon is the deepest instrument of the orchestra and the low tones may be lost if too far from the mike.

Saxophone

Sound Source: air passing through a reeded mouthpiece produces vibrations of the air column in the expanding brass tube. Notes are varied by stopping and unstopping holes along length of instrument. Sound issues from bell of instrument and also from holes along its length.

Microphone Technique: there are twelve varieties of saxophone running from the soprano to the bass, hence the tonal range is great. The higher instruments should be recorded as is the clarinet, excepting for the fact that the sound issues from the bell as well as the openings. The lower-toned saxophones would be more like the bassoon. The tone is rich and penetrating and no difficulty should be experienced in making a good clean pickup. A recording distance of from three to five feet is suggested, modified as necessary depending upon the amount of bass. If the bass notes distort, the instrument is too close to the mike; if they fail to come through properly, or fall off, then the distance to the microphone is too great.

Accordion

Sound Source: Air is forced against reeds of various sizes and thicknesses to produce the range of notes. Valves or stops controlled by keys or buttons permit selection of notes to be played. Most of the tones come from the openings above the keyboard where the melody reeds are located. The accompaniment, or bass reeds, are in the other end of the instrument.

Microphone Technique: The keyboard end of the instrument should face the microphone and the distance should be about four feet. Closer than this will produce blasting and care must be exercised when playing the instrument that the extension of the bellows does not bring the accordion too close to the mike. Usually enough of the bass tones are heard even though the keyboard end of the instrument is favored. If the bass is not sufficient then the mike position may be changed and shifted a bit toward the bass end of the instrument. Listen for any mechanical noise caused by the operation of the keys and if these are heard in the trial recording, increase the distance from the microphone.

THE BRASS INSTRUMENTS

Trumpet

Sound Source: The vibration of the lips in a cupped mouthpiece is transmitted to the air in a curved tube which causes the air to vibrate. Notes are formed by varying the compression of the lips and also, in the valved trumpet by bringing the valves into play which shortens or lengthens

the air column of the tube and thus raise or lower its frequency. The sound emerges from the bell at the end of the instrument.

Microphone Technique: Since the tones of the trumpet emerge from the bell, the most direct pickup is to play it with the bell pointed directly at the microphone. The distance should be from five to six feet which is far enough to prevent blasting and at the same time close enough to prevent interference from room echos, which may distort the tones or interfere with the definition.

A side pickup may also be employed where the instrument is positioned to the side of the mike and played across its pickup beam. Here the distance will be on the order of two feet. The results are good but some of the fullness may be lost.

Muted trumpet: A mute of metal or composition is inserted in the bell of the instrument almost completely blocking the direct sound. The mute then becomes the source of vibrations which are transferred to the air.

Microphone Technique: With the mute in place the volume of the trumpet drops tremendously. For a direct pickup, with the bell pointing toward the microphone, the distance should be shortened to about two feet away. If a side pickup is used the distance should be reduced to about six inches with care being taken to hold the instrument steady or a shift in perspective will be apparent in the recording. A trial recording is a good investment to check the positioning of the mike and instrument.

Cornet

Sound Source: same as trumpet except an octave higher.
Microphone Technique: same as trumpet.

Trombone

Sound Source: Air forced through the lips causes them to vibrate and thus vibrate air in tube producing tones which are regulated by lengthening and shortening air column by means of a slide.

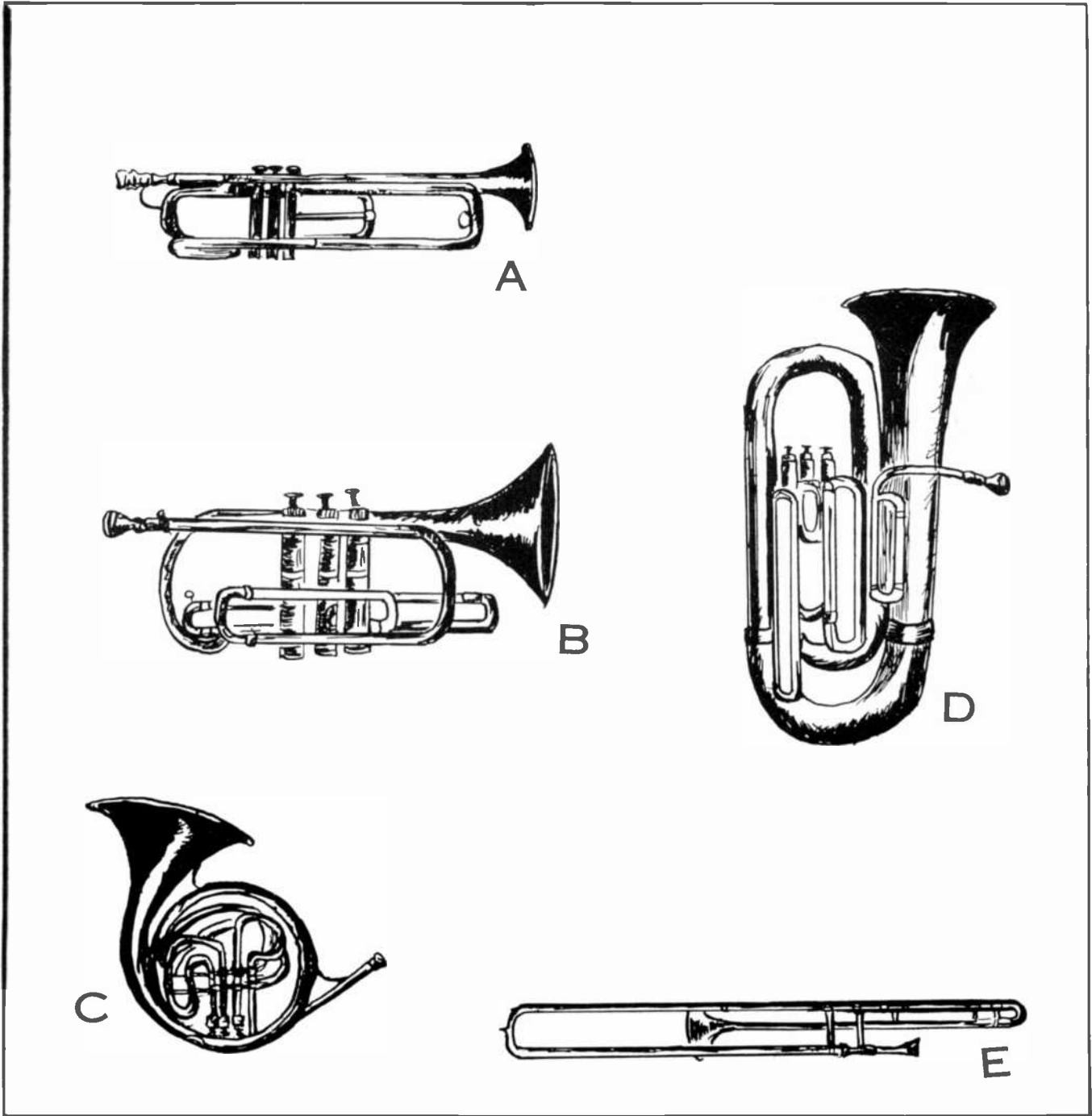
Microphone Technique: Despite the size of the instrument, its volume is not what you might expect, thus a distance of three or four feet from the microphone is proper. The bell of the instrument should be pointed directly at the mike. If the bass notes are boomy, move back slightly or change the position of the instrument so that its tones hit the microphone off the center of its pickup beam. A muted trombone will have approximately the same characteristics as a muted trumpet and the instrument should be brought closer to the mike. With the instrument at a 45-degree angle to the mike, the mute should be from six to twelve inches from the microphone.

French Horn

Sound Source: vibrations of the lips in a mouthpiece causes the air in the tubing to vibrate. Valves are used to vary the effective length of the sound travel and thus vary the tones. When the instrument is in playing position, the bell is toward the rear.

Microphone Technique: Since the sound is directed downward and backward the microphone must be placed where it will make a direct pickup of the sound issuing from the

BRASS INSTRUMENTS



A. Trumpet B. Cornet C. French Horn D. Tuba E. Trombone

bell of the instrument—which means it goes back of the musician. The microphone should be set up about six or seven feet from the instrument to capture the fullness of tone. It is also possible to have the horn played near a hard-surfaced wall that will reflect the sound forward and the mike can be placed to pick up the reflected sound.

Tuba

Sound Source: The air in the tube is set in motion by the

vibration of the lips in a mouthpiece. Notes are formed by the lips plus the valves. The sound emerges from the bell of the instrument. While similar to the French horn in construction, the tuba horn sweeps forward and up in contrast to the backward bell of the other.

Microphone Technique: The notes of the tuba are very deep and full, much like the string bass, and while they have great intensity and body, they do not tend to produce boominess. For tuba solos the instrument should be positioned five to six feet from the microphone with the bell turned so

that it faces across the microphone beam. Should distortion occur, move the instrument back farther from the microphone or turn the bell at a greater angle to the microphone beam.

THE STRINGS (bowed) Violin

Sound Source: the passage of the bow across the strings causes them to vibrate. These vibrations are transmitted through the bridge holding the strings to the body of the instrument which amplifies them. The sound issues from the "f" holes of the soundbox.

Microphone Technique: since the sound is created by the strings and amplified by the box, the principle of violin pickup is simple—simply make sure that the *f* holes and strings are in the center of the microphone beam. The instrument should be held at a distance of three to four feet away. The distance should not be decreased or the scraping of the bow over the strings may be picked up. If such is the case, the mike should be moved farther away. If the tones to be played are either almost entirely in the high or low register, the volume will fall off and the violin may have to be moved in to about two feet from the microphone. Bowing sounds are much less at either end of the tonal register

for some reason. Variation can be secured by moving the instrument in close for high or low tones and moving it away when the full tones are played or the instrument may be turned at an angle to the microphone beam.

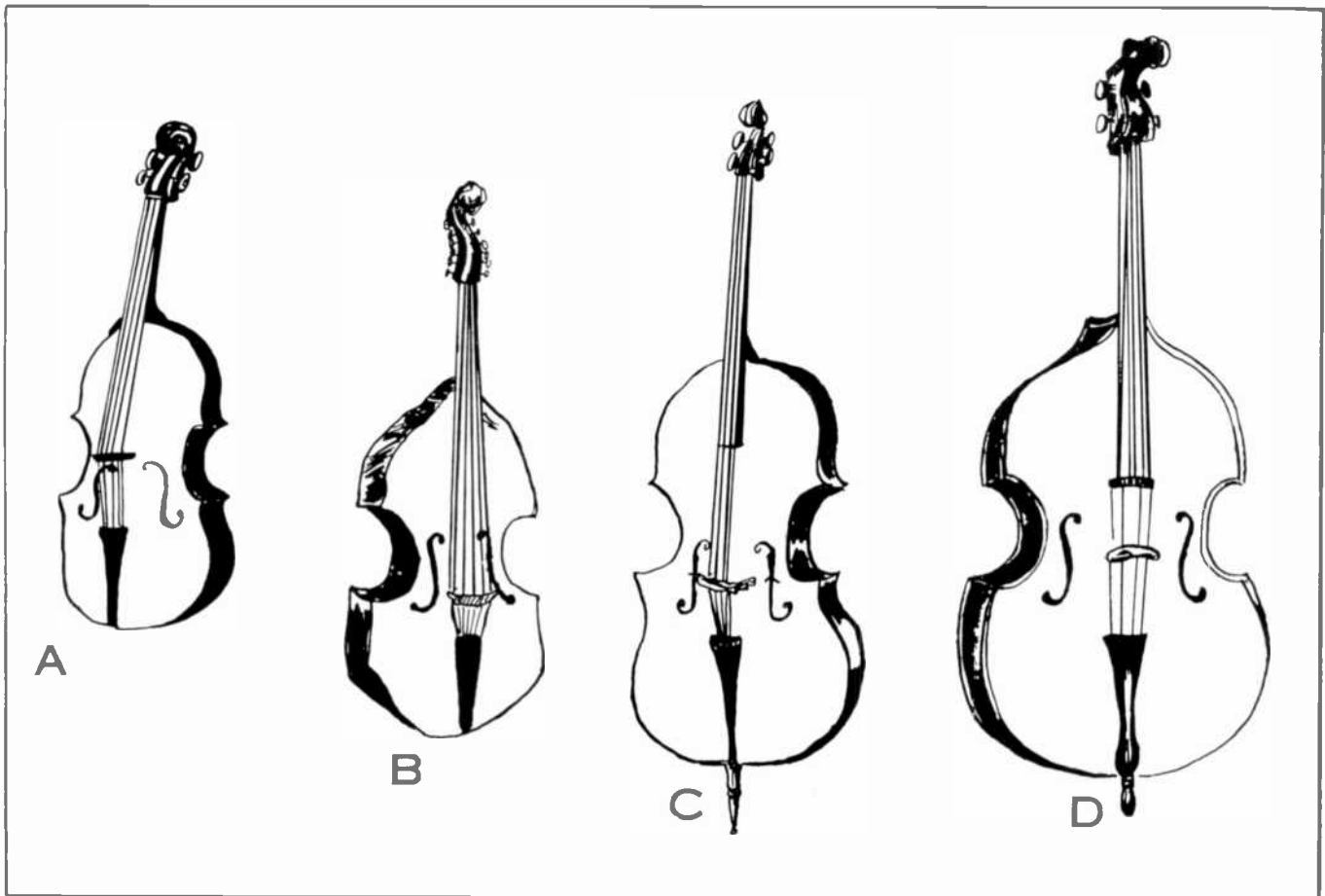
When the violin is muted the volume is cut down and the instrument must be moved in to a foot or less from the mike. If you desire the tones to be intimate and full on either a regular or muted recording, set the violin in the closest possible position at which the tones are not distorted. This would be about three feet in a straight set-up. For a distant pickup, the instrument may be as much as ten feet from the mike; however such recordings may sound thin and weak.

Viola

Sound Source: same as the violin except tone is deeper and less penetrating than violin.

Microphone Technique: Positioning the same as for the violin. Attention must be paid to the position of the *f* holes and the strings in relation to the microphone. A good recording of a viola will produce tones that are full and deep. This will be lost if the instrument is too far from the mike since its low tones fall off faster than those of the violin. If the instrument is too close to the mike its tones will distort so this should be watched.

BOWED STRINGS



A. Violin B. Viola C. Cello D. Bass Viol

Cello

Sound Source: same as in the violin. Instrument is larger and is played from a sitting position with the tailpiece resting upon the floor. It is held in an upright position.

Microphone Technique: the microphone must either be lowered, so that its beam faces the *f* holes and strings, or tilted to achieve the same effect. The microphone should be placed at a distance of four to five feet from the strings. The cello may also be played by placing the tailpiece on a chair to raise the instrument. This has two disadvantages: the instrument may be more difficult to play and the resonance which is added by the reflection of sound from the floor will be lost. Because of the problem of picking up both the high and low tones fully, it may be necessary to set up the instrument with its *f* holes facing the mike and ride the gain on the recorder by increasing or decreasing the volume as necessary to get a good, full recording. The other method is to bring the cello in to about three feet from the microphone and set the recorder volume to properly record the highest and lowest tones. For all other tones, the cello is turned so that the *f* holes are slightly to the side but yet within the microphone beam.

Bass Viol or Contrabass

Sound Source: same as preceding instruments. This is the largest of the violin family with deep intense tones. It is

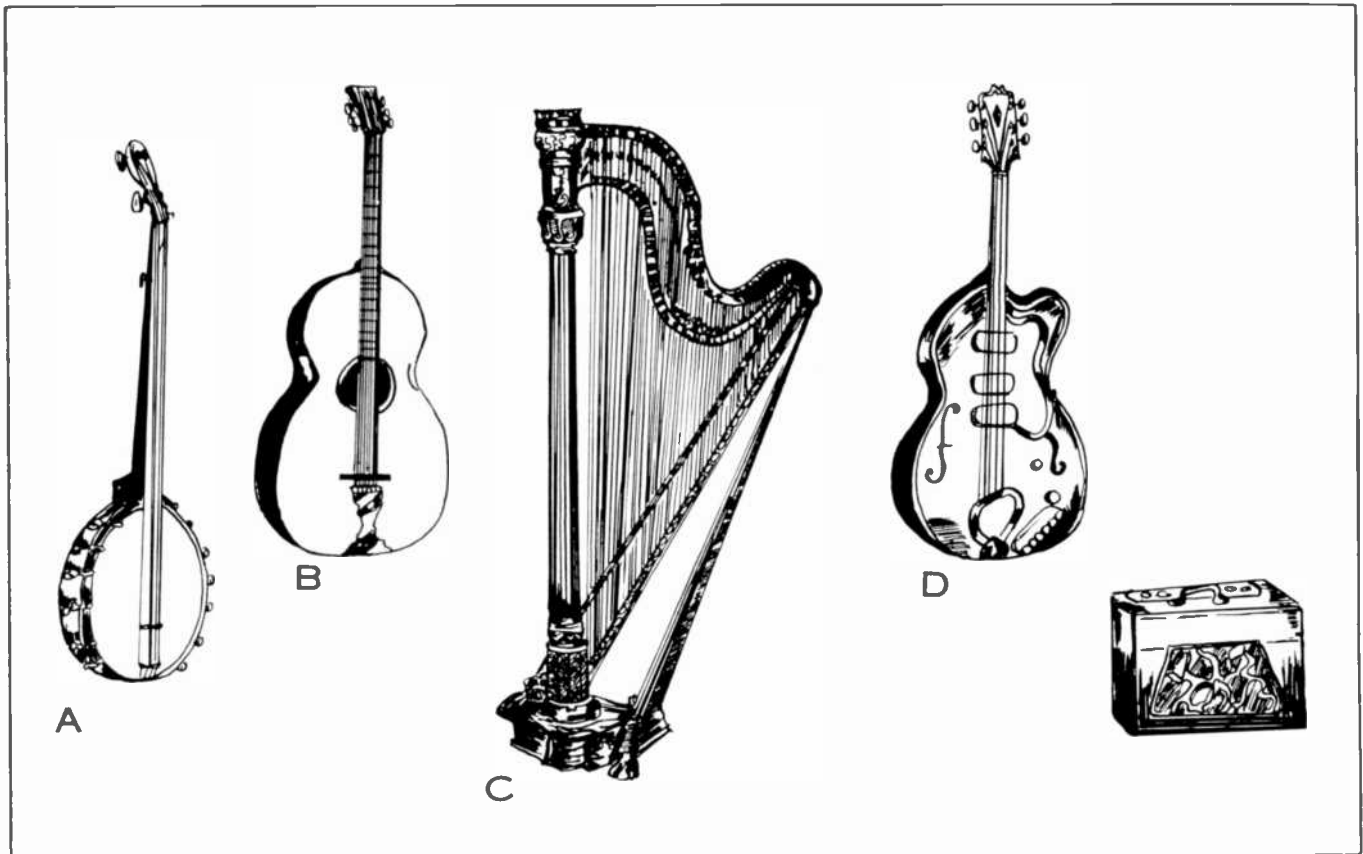
played from a standing position with the tailpiece resting on the floor. It is played in two different ways, one with a bow, as with the violin and the other by plucking the strings which produces a sharp tone.

Microphone Technique: In recording a Bass Viol used with a bow it should be placed eight to ten feet from the microphone with the *f* holes aimed at the mike. If there is not enough room for this, then it may be placed about three feet from the mike with the back of the microphone, or dead side, toward it. The tone quality will not be as good as with a direct pickup but usually will produce an acceptable recording.

When the strings are plucked by hand the tone is sharper but not as powerful nor does it carry as far. To get a full recording the instrument must be brought in to about five feet from the microphone, making a direct pickup. If space does not permit the more distant type or pickup, the instrument may be brought in to about two feet from the side or back of the microphone, whichever produces the best tones in the recording. It may also be placed directly in front of the microphone provided the mike is not tilted downward to face the *f* holes. Here the tones are projected below the microphone beam and are thus picked up indirectly.

If the recording should show a decided boom or "woofing" on certain notes, the trouble may be caused by some object in the room, or even the room itself resonating to the tone. Try turning the instrument about a quarter turn from its

PLUCKED STRINGS



A. Banjo B. Guitar C. Harp D. Electric Guitar & Amplifier

former position and setting up the mike again. If it still persists, put a small rug under the tailpiece or, as a last resort, hang drapes on any hard walls or windows that might be reflecting too much sound.

Strings (plucked)

Harp

Sound Source: the harp has vertical strings running down to a sounding box on the lower portion of the instrument. These are plucked by hand, the vibrations being transmitted to the sounding box which amplifies them. Control of the pitch is secured by use of the pedals on the pedestal.

Microphone Technique: Since the volume of the tones of the harp is not very high, the microphone must be placed fairly close to the instrument. The microphone should be placed at a distance of four to five feet with the mike beam pointed at the sounding board. It may be necessary to incline the mike to accomplish this.

If the microphone is too close, the noise of the strings being plucked will be prominent and the tones will not be as good as they can be. If too far away, the definition will be lost.

Banjo

Sound Source: the strings of the banjo are plucked which causes them to vibrate. The vibrations are transmitted via a bridge to a parchment-like covering. Some of these are open to the air on the back and others have a sounding box with holes around the rim which throw the sound forward.

Microphone Technique: Since the sound of the banjo resonates from the drum-like head or sounding box, a direct pickup with the mike beam aimed at the banjo head is best. A distance of three to five feet should prove right since the banjo is an instrument that has fairly good volume. As with other instruments, too close a mike position will cause distortion.

Guitar

Sound Source: the older type consists of six strings stretched across a flat box sounding chamber which has a round hole under the strings from which the reinforced sound emerges. The newer type is more like a violin, with *f* holes. This type of guitar was produced to "beef up" the instrument in relation to other instruments in an orchestra and its tones are stronger and more piercing.

Microphone Technique: the older type, with its soft, mellow tone, must be placed not more than two feet from the microphone with its sound hole facing the mike. The instrument may be played in a seated position or the foot may be placed on a chair seat and the instrument supported by the thigh. The newer type of guitar, with its stronger tone, should be placed about three feet from the mike. The strings should be in the microphone beam or they may tend to sound thin instead of full. Single string solos on the guitar can come as close as one foot from the mike.

Electric Guitar

Sound Source: the electric guitar is made of metal or com-

position material and instead of depending upon a sound box to amplify the notes, electronics are used. The sound pickup is made by having a strong electro-magnet under the strings. When the strings vibrate, their motion changes the current flowing in the coils of the magnet and this is fed to an amplifier. Some instruments have volume controls, permitting the swelling or diminution of the sound much like an organ.

Microphone Technique: The sound issues from a loud-speaker and this may be placed on a table or chair and the microphone aimed at the center of the cone from a distance of four or five feet. If the sound level is too high it may be reduced by using the guitar volume control. In some instruments, reducing the volume too much will introduce distortion in the low notes. If such is the case, keep the volume high enough to eliminate the distortion and make the pickup from a greater distance or aim the speaker across the microphone instead of into it. Do not put the mike too close to the speaker or hum may be introduced.

PERCUSSION INSTRUMENTS

Piano

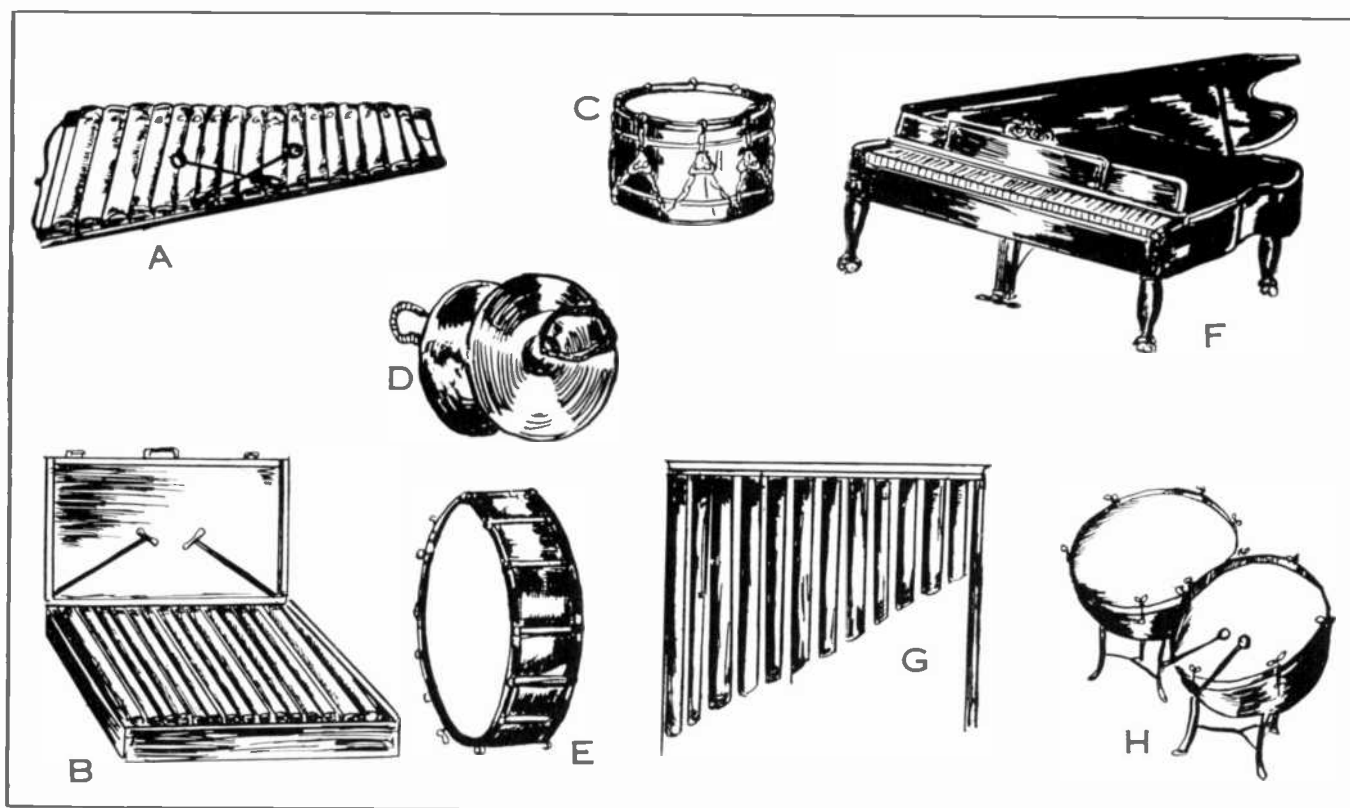
Sound Source: felt covered hammers strike the strings and set up vibrations in the sounding board which in turn transmit them to the air, within the piano box. Pedals are used to modify the sound created by the hammers.

Microphone Technique: Basically on any type of piano pickup the microphone should be placed so that the waves emanating from the sounding board strike the microphone directly. The distance may range from two feet, for a pickup of a spinet, to twenty feet for a pickup of a concert grand. The chief danger in piano recordings is distortion, for the sharp striking of the strings can readily cause blurring and loss of definition. Any time the tones are not crisp and clear, or when they seem to lose their highs, or when specific tones ring or echo, the microphone has been set too close. Too distant a pickup will result in excessive reverberation and the definition of all tones will suffer. For the spinet or upright piano, the best pickup can be obtained by swinging the piano away from the wall and placing the microphone behind it at a distance of four to five feet. If this is not possible a pickup may be made from the front of the instrument but noise from the piano keys or the pedals may also be picked up. When making a pickup from behind the instrument, the mike may be placed at a height equal to the center of the sounding board and either the bass or treble tones may be favored by simply turning the mike a bit toward the end to be favored. Here the microphone is placed for a close pickup with a distance of two or three feet from mike to sounding board.

The pickup for an upright piano is about the same as for the spinet. It is preferred that it be moved away from the wall. It is also possible to open the top of the case and, with the microphone at a height of about six feet and toward the treble side, to point it toward the sounding board. For a rounded effect the microphone may be moved back to from ten to twenty feet.

The grand piano presents different problems since, with the lid closed, the sound can only issue from the underside of the piano. On the low stick it can emerge from the opening thus made but to get full value from the tones, the high stick should be used. This aids the definition, par-

PERCUSSION INSTRUMENTS



A. Xylophone B. Glockenspiel C. Snare Drum D. Cymbals E. Bass Drum F. Grand Piano G. Chimes (Carrillon) H. Kettledrum (Tympani)

ticularly of the bass notes. For an intimate pickup, the microphone should be placed facing the upraised lid at a distance of six to seven feet. It should be turned so as to favor the tones of the upper register. If the room produces a boominess, the mike may be moved in to about two feet from the curve of the piano with the top on low stick and the treble notes favored to prevent the bass notes from hitting the microphone too strongly. The ideal pickup for a grand piano is at a distance of fifteen or twenty feet with the mike raised to a height of ten feet and pointed toward the sounding board. This is practically impossible in the average home, hence the intimate type of pickup must be used.

Bass Drum

Sound Source: the instrument is a short cylinder of wide diameter, each end of which is covered by vellum. Leather or other braces change the tension to produce the desired tone. It is played by being struck with a stick having a soft, round knob on one end with the drum set on edge. The vibration of the head causes the air inside the drum to vibrate and be amplified.

Microphone Technique: since the tones produced are very heavy they will distort if picked up too closely. The microphone should be set up eight to ten feet from the drum.

Kettle Drum

Sound Source: the kettle drum has the open part facing upward and over this is stretched the vellum drumhead.

Tension on the head is set by screws along the rim and a pedal is also provided for variations in the basic tones set by the screws. When the head is struck the vibrations of the skin, air chamber and kettle combine to produce a resonating tone. There is a small pressure relieving hole in the bottom of the kettle to prevent the concussion from breaking the drum head.

Microphone Technique: The microphone should be set up at a distance of from ten to fifteen feet from the drum. If the room is too live, boominess may result in which case the microphone should be moved closer and the drum played more softly. The drum may also be placed to the side of the microphone beam and a rug placed under it. Breaking up any sound reflecting surfaces in the room with drapes, etc., will also help.

Snare Drum

Sound Source: the snare drum is a small drum with parchment or vellum stretched over one or both ends. The tension is controlled by hoops over the heads which have metal rods or laced cords as tighteners. Several catgut cords are stretched across the lower head skin.

Microphone Technique: the drum has two characteristics which affect its recording: the noise it creates is fairly high in frequency and the peaks are very high. This means that without a very good high fidelity system you won't be able to record all the frequencies produced by the drum. Sometimes you will be able to get it on the tape but the limitations of the loudspeaker may be such that it won't

play it all back. This usually makes the drum sound muffled instead of crisp and clear.

For a snare drum pickup the microphone should be set up about eight to ten feet away. If a closer pickup is necessary, because of space limitations, the microphone may be placed closer but turned so that the drum is not in the center of its pickup beam. Some of the higher frequencies will be lost but the peaks will be subdued and reduce the chance of distortion.

Cymbals

Sound Source: two thin circular metal disks which are brushed together with some force, or one may be mounted on a bass drum to be operated by a foot pedal. It is also played by being tapped with a drumstick or brushed with a wire brush.

Microphone Technique: the pickup distance must be a compromise with the bass drum recording distance since the cymbals are usually used in conjunction with it and the snare drum. If the cymbals are being played alone or have solo spots when the drums are not sounding, the volume on the recorder may be increased and then lowered again when the drums are due to sound.

Chimes

Sound Source: the chimes are a series of tubes of metal the length determining the pitch of the tone produced. They are struck on top edge with a knobbed stick which sets the air within the tube in motion and produces a note of bell-like quality.

Microphone Technique: The microphone should be set up eight to ten feet from the chime rack with the treble end favored by being the closest to the mike to compensate for the lower volume of the high notes.

Xylophone and Vibraphone

Sound Source: the instrument consists of a number of wooden blocks laid parallel across a wood or metal frame. Some instruments have resonating tubes below the blocks to increase the volume of the sound. It is played by striking the blocks with two wooden hammers.

Microphone Technique: the sound level of the xylophone is relatively low so the microphone should be set up at a distance of six feet in a direct pickup position with the treble end favored slightly. It should not be placed too

close to the instrument since this will tend to reduce the liveness of tone characteristic of the instrument.

The vibraphone is a development of the xylophone and uses metal plates instead of wooden blocks. In addition electrically driven vanes are mounted inside the tubes. When the bar is struck, the vanes modulate the air vibrating in the sound tubes producing the vibrato effect. The vanes can be turned on and off and in addition, there is a dampening bar which is actuated by a foot pedal.

The tones of this instrument are heavier and the microphone should be set up from eight to twelve feet from the instrument. Too close a miking will produce a booming of individual notes while too distant a pickup will tend to distort the bell-like quality of the tones.

Glockenspiel

Sound Source: this instrument consists of a set of flat steel plates which give off bell-like tones when struck with a hammer.

Microphone Technique: having less volume than the chimes, the microphone should be set up five to eight feet from the instrument. The beam of the microphone should be directed toward the steel plates, making a direct pickup.

The microphone positions given, and the distances should be changed to suit the conditions under which the recordings are made. Some microphones have higher outputs than others and hence, may be used at a greater distance. Some have wide-spreading beams and must be turned more than a narrow beam microphone when such turning is suggested.

The best plan is to follow the suggestions outlined under each instrument and then make a trial recording having the soloist play both the softest and loudest passages of the composition to be recorded. This recording should then be played back and, if satisfied, the actual recording can be made. If changes are indicated, they should be made and another trial recording made. The trial recordings are the best test and need not run more than a half-minute or so, just enough for you to check the balance, tone distortion, if any, volume settings, etc.

While this article encompasses the most common instruments there are some which have been omitted. Setups for those can be figured by comparing them with one of the instruments which are listed. In any event by analyzing the instrument in terms of sound production, volume and playing characteristics, no difficulty should be encountered in arriving at the best recording setup.



Fig. 1: "Yea, team!" Whether you're rooting for the home basketball squad or simply leading a group of squaredancers, this highly efficient Sound Gun—which is plugged into your tape recorder for power—comes in handy to amplify your normal voice to a loud roar.

Recorder Into Sound Gun

by Tommy Thomas

... this novel amplifying sound gun is fun to make and even more fun to use.

IF your tape recorder can be used as a public address system, as so many of them can, then you already have most of what you'll need to make a highly effective "Sound Gun." Somehow, the fact that our recorder can be used as a P.A. system gets pretty well overlooked by most of us. And that's a shame, because there are marvelous possibilities in being able to amplify the tiniest voice into a mighty one. And even more ideas will suggest themselves to you once you actually have this free-wheeling "Mighty Mite" of a Sound Gun in your hand. Besides using it for small-scale cheer-leading, you can use it at parties, during Cub Scout Den Meetings (now your wife can easily out-shout the noisiest gang of kids), for supervisory life-guard work around the swimming pool, and even for calling the children to supper, etc.

Most of the low-cost materials you'll need for construction of this fun-to-make device are shown in Fig. 2. The colorful red and yellow plastic toy Sound Gun ("A") only costs a dollar. It's sort of a pretend-type voice amplifier for kids, and ideal as a housing (it's completely hollow inside) for the various parts you'll be using. Most likely you can buy one of these plastic toys at a neighboring store, but if not, send \$1.35 to Sunset House, 102 Sunset Bldg., Beverly Hills, California.

You'll also need fifteen to twenty-five feet of Belden #8403 shielded microphone cable. This is regular 3-conductor cable ("B" in Fig. 2) obtainable at your local radio

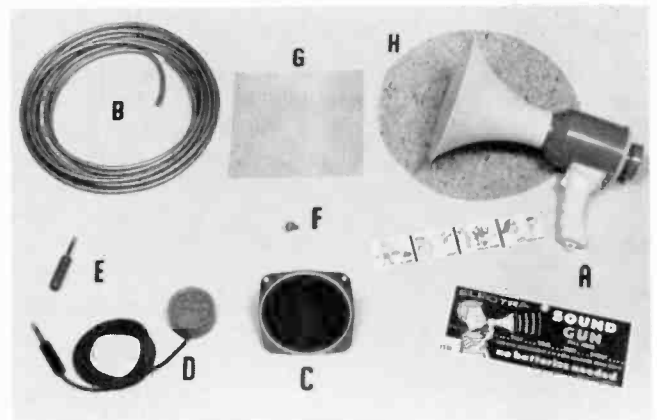


Fig. 2: Total cost for the basic "ingredients" is not much over five dollars, especially if you already have a spare crystal mike (such as "D") you can put to good use here. By housing everything in a colorful new plastic Sound Gun toy ("A") now on the market, you can assemble a finished unit that is as attractive as it is useful.

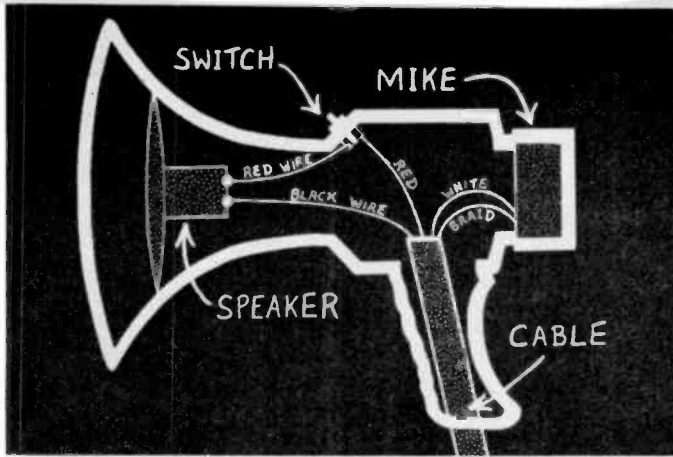


Fig. 3: This is the basic wiring at the Sound Gun end, showing how 3-conductor microphone cable (which utilizes the shielding as the fourth conductor) is used to lead from the mike to the recorder, as in Fig. 12, then back again to the auxiliary speaker. Actually, this is just a "roundabout" usage of your recorder's P.A. system.

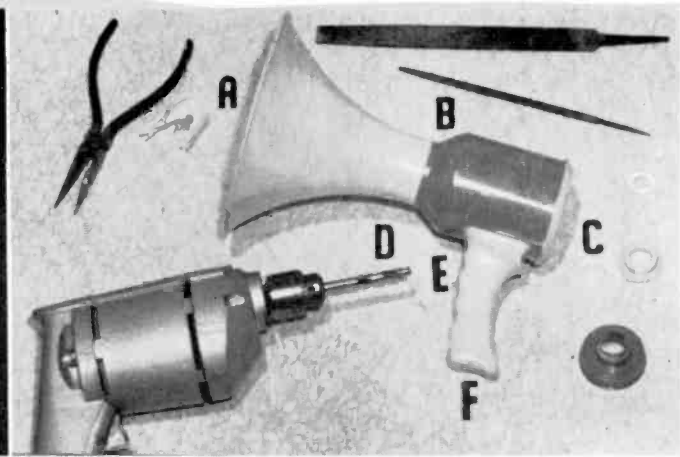


Fig. 4: The toy "gun" is prepared for electronic use by removing a few plastic protuberances that are in the way, and by cutting and drilling out some necessary holes here and there for a switch, wiring, etc. Be especially careful, when drilling, to start with a small-size bit at first, to avoid cracking or splitting the plastic.

parts supply store or from one of the mail-order supply houses. Picking out the proper loudspeaker ("C") is quite important. The one shown here is a 4" square Jensen Model P4-W speaker, with a 1-oz. magnet and rated at 3.2 ohms, 4.5 watts (and costing about \$2.50). It's just the right size and weight for the plastic housing, once it's trimmed (already-round speakers of this size apparently are not available). The high impedance crystal microphone used ("D") needn't be an expensive one for this type of voice-only use. Most likely you've long since upgraded yourself on recording microphones, so you'll have the "old" mike that originally came with the recorder to put to very good use here. If not, shop around for something in the three-dollar class. Or if you intend to use it outdoors mostly, it might be worth spending a couple or so more dollars for a more rugged ceramic mike, since they're fairly immune to heat and humidity damage. MIKE SHAPE! I happened to have a nice-looking little round mike on hand, but it can be most any shape, really, as long as it's reasonably lightweight and not too bulky.

Fig., below: Round 4" loudspeakers seem to be non-existent so you'll have to fashion one of your own. The Jensen 4" square speaker is very appropriate for this adaption purpose as it is especially easy to trim. At each corner, first cut off a large section as shown and then carefully trim the remainder. Don't puncture the cone, now.

Fig., right: Carefully lower the rounded speaker into the "horn" of the Sound Gun. When centered, hold onto the speaker edges firmly (it'll tend to slip around on the smooth plastic) as you scribe a line all around the circumference. This will be your Cement Line and also a guide for the black-painting that'll hide the inner wiring.



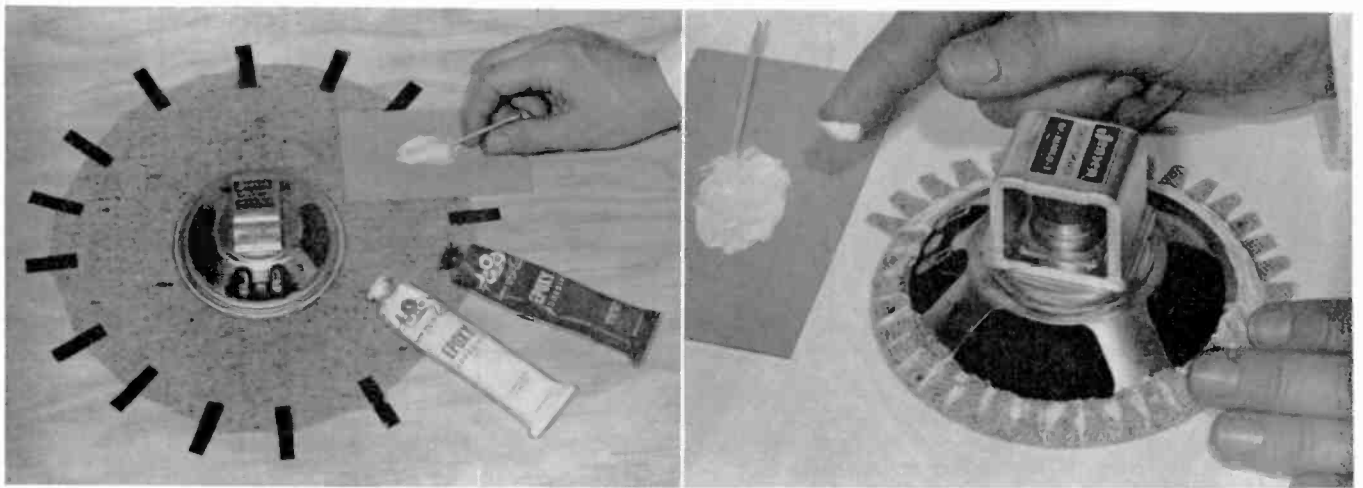


Fig. 7-a, left: The speaker covering (the mesh is optional) needn't be this large, as a 6" square or circle of cloth is ample. But it should be stretched out on a board and tape-pulled securely as shown (with wax paper underneath) before Epoxy-mounting the speaker down. Fig. 7-b, right: After completely drying in place, loosen the taped-down cloth and trim it to within a half inch of the speaker's rim. Then go all around again, notching the cloth and finally bend-fastening the remaining "tabs" to the speaker's edge with more Epoxy.

is a for-looks-only fancy plastic protuberance that must be carefully removed to make room for the speaker. A pair of needle-nosed pliers and a screwdriver will be especially useful here. At point "B" drill a $\frac{1}{4}$ "-hole for the "Tini-Switch" to be installed later. At the rear of the plastic body ("C") is

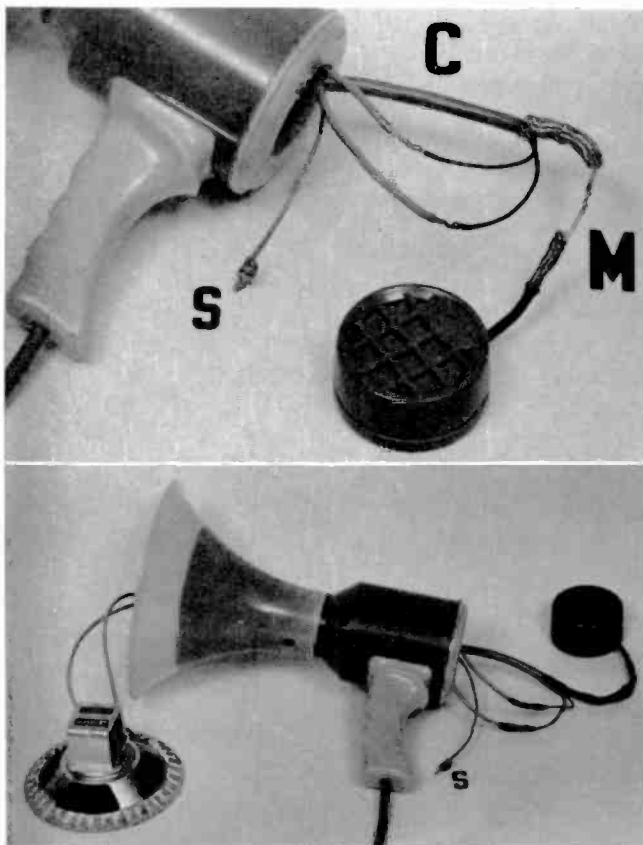


Fig. 8, top: A critical part of the wiring comes in joining the shielded mike cable to the braid (shield) and one wire of the 3-conductor group. The external shielding should be loosened and pushed back as shown, and the center wires carefully joined and soldered and taped. Then the shielding is "returned" and gently soldered. Fig. 9, bottom: There isn't room inside the Sound Gun for the needed splicing together and soldering of the various wires, so the actual wiring will differ a bit from the basic diagram of Fig. 3 in that the wires have to be long enough to be pulled out at either end. Also, adding "auxiliary" speaker wires will further simplify the wiring.

a special plastic mouthpiece that should be removed (just saw it off flush) and about a one-inch hole drilled and/or cut into the middle-back (see Figs. 8 and 10). And notice that you'll need a *notch* filed out beyond the cut-out hole, for the mike cable. At point "D" exactly underneath the horn put a $\frac{3}{8}$ " vent hole. It sounds better when the air behind the loudspeaker is allowed to escape this way. The toy "gun" comes with a fake trigger molded into the handle at point "E". File it off completely, as it just gets in the way. Also file off the little plastic projection at point "F", at the bottom of the handle. Then, with an extra-long $\frac{1}{4}$ " drill bit, drill a hole at this point and continue up and through the hollow handle and drill a second hole through the body of the Sound Gun. These holes are for the 3-conductor cable that comes from the recorder.

After carefully rounding the 4"-square speaker with a pair of metal-cutting shears, file the edges smooth. Then slip the speaker temporarily inside the Sound Gun's horn as shown in Fig. 6 and scribe a line around the circumference. **OPTIONAL!** I lightly sanded the inside of the plastic horn all beneath the scribed line and painted it black (tho I kept the black paint uniformly $\frac{1}{4}$ " below the scribed line so as not to interfere with the adhesive later). By painting this portion of the horn inside I kept the sloppiness of the extra Epoxy adhesive from showing through the translucent yellow plastic. It makes for a nicer-looking final result.

Figures 7-a and 7-b show how the grill cloth is fastened to the speaker *before* it is mounted in the Sound Gun. With the cloth stretched out and ready, with wax paper underneath, spread a narrow ribbon of Epoxy adhesive all along the front cardboard rim of the speaker. Then put the speaker pressed face down centered on the cloth and let dry overnight. When completely dry, remove the taped-down cloth from the board and complete the trimming and Epoxy-fastening of the cloth as shown. **OPTIONAL!** If you're making this Sound-Gun to be used by children (who might carelessly poke the speaker cloth), it would be a good idea to protect the delicate cone with a 4" circle of *wire mesh* ("G" in Fig. 2) put between the speaker and the grill cloth. "Glue" it in place with Epoxy right along with the cloth (Fig. 7-a).

Now you're ready to do the wiring. Split the 18" length of zip-cord in two, making two individual 18"-long wires.

Cut one of these wires into two smaller lengths: one 11" and one 7" long. Solder one end of each of these wires to the terminals of the "Tini-Switch." Now mount the switch permanently in place atop and inside the Sound Gun body, with the 11" wire coming out the front and the 7" wire coming out the rear. Solder the front wire to one terminal of the loud-speaker. Solder one end of the remaining 18" wire to the other terminal of the speaker . . . and then push the rest of this wire right through the Sound Gun housing and out the rear. (This cut-off switch is added to the circuit as an emergency device to stop occasional "runaway feedback" noise.)

Push the main cable up and through the handle of the Sound Gun and out the rear. Remove about three inches of outer insulation from the main cable "C", push back the braided shielding to loosen it, cut a tiny hole in this shielding back by the insulation and then pull out the red and black inner wires through this hole. These two wires are solder-fastened to the two zip-cord wires (the wires coming from the speaker via the switch) as shown in Fig. 8. Now shorten the shielded mike cable "M" to about three inches and carefully fasten and solder it as shown, to the main cable "C". Tape-insulate the bare, soldered-together inner wires and then "cover" with the shielding again . . . which is also carefully soldered together. Tape all of the bare wiring and then, **TEST THE SYSTEM!**

If everything works okay, and it should, you're ready to mount the speaker permanently inside the horn with Epoxy adhesive. This is easiest done with someone helping you. So first, fasten a *string* "S" to the speaker wires, about six inches from the speaker, and lead this string through the housing and out the rear (Figs. 8 and 9). Now take the speaker and lower it carefully and evenly down into the horn. At the same time, to keep the wiring out of the Epoxy which has been spread generously all along the previously scribed line, have your helper pull gently on the string from below. With care, this can be done very neatly . . . then let dry overnight.

With the speaker firmly dried in position, you're ready for the final job: mounting the microphone. First, though, Epoxy-fasten a 1/4"-thick rubber or cork gasket around the cut-out hole at the rear of the housing, remembering to cut a "gap" for the mike cable (Fig. 10). The gasket acts as a *cushion* to isolate the mike from the speaker housing, otherwise you run the risk of the microphone picking up the speaker vibrations (which will cause your Sound Gun to



Fig. 10: A 1/4"-thick rubber "gasket" is first Epoxy-fastened to the rear of the Sound Gun, around the previously cut-out hole made for wiring ease. Then the rear chamber is completely, solidly packed with cotton, to keep the speaker vibrations from affecting the microphone, which here is all ready to be "Epoxyed" in place.

"howl"). For this same reason, you'll have to stuff *cotton* into the main housing chamber, right up to the top of the special gasket. **NOTE!** First, though, cover the switch inside loosely with something non-inflammable, so the cotton can't catch fire.

NOW MAKE A FINAL TEST! With the unit plugged into your recorder, hold the mike *quite firmly* against the rubber or cork gasket and say a few dozen words . . . with the volume as high as possible. Finally, with everything checked out as okay, you can fasten the mike permanently to the gasket with a final "helping" of Epoxy.

That's it! You're all set to go! When you use the Sound Gun, talk with your mouth directly against the microphone. Your upper lip should actually be touching it. Turn the recorder volume up as high as it will go before "squealing" or "motor-boating," and make a note of this setting for future use. And if your recorder has a *Tone Control*, find the tone setting that permits the highest volume. With a Wollensak recorder, for example, I had trouble until the tone control was set almost (but not quite) on "Treble." From then on it worked beautifully. And of course you don't need a volume control on the Sound Gun itself, since you can easily control volume there by raising or lowering your voice.

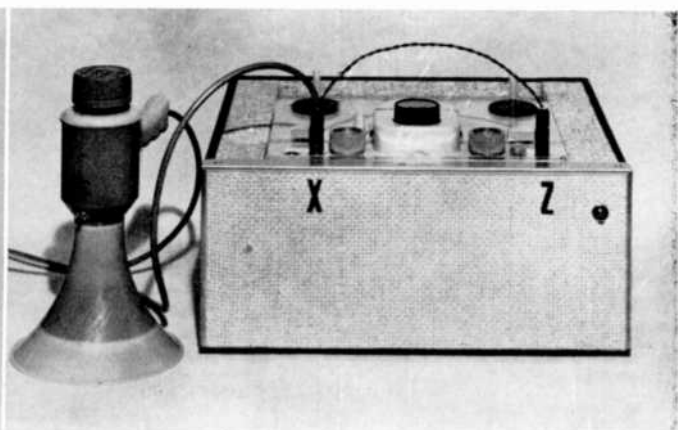
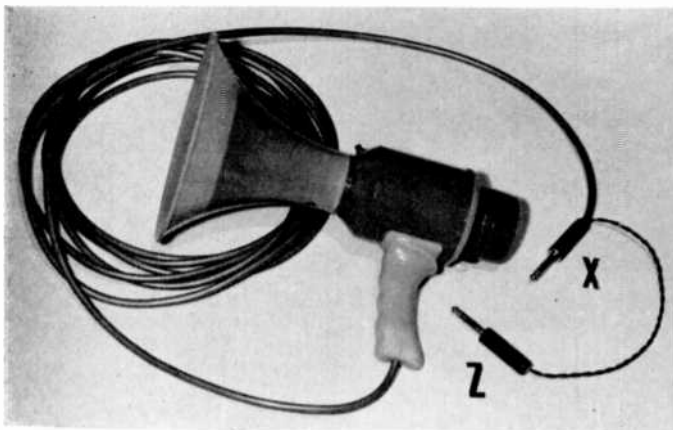


Fig. 11, left: The finished Sound Gun, complete with eighteen feet of cable and a set of input plugs. The exact end-wiring here and the type cable plugs you use will depend on the recorder you have, but the wiring hookup will be essentially the same. Plug "X" goes to the microphone input and plug "Y" goes to the auxiliary speaker output. Fig. 12, right: Measure between inputs "X" and "Z" and add three inches. Remove this much insulation and shielding (though leave one inch of exposed shield) from the main cable and then shorten the white wire to one inch. The shield/white wires fasten to plug "X" and the red/black wires (twisted) go over to the auxiliary speaker output.

How Your Recorder Works

by Mark Mooney, Jr.

Part III—The Magnetic Heads

THE heart of any tape recorder is the magnetic head. Of all the parts of the machine it is the most precisely made and has the finest tolerances. There are generally two heads in every recorder, an erase head and a record/play head.

Of the two, the record/play head is the most critical in terms of characteristics and dimensions for it is this head which determines how well the recorder will record and play back from the tape.

The function of the erase head is to wipe the tape clean of all signals before it reaches the record head. This is accomplished by feeding into it a high frequency current, from 30 to 100,000 KC, depending upon the design of the recorder. This rapidly alternating current causes the magnetic domains on the tape to become scrambled which, in effect, removes any signal that was on the tape. The gap length in an erase head may be as much as 200 times the length of the gap in a record/play head since its chief function is to supply a strong magnetic field to erase the tape and the longer gap is more efficient at this. Also, the current fed to the erase head is on the order of 10 times the strength of that going into the record head. This usually is supplied by the same bias oscillator that supplies current to the record head during recording.

The alignment of the gap of the erase head also is not as critical as that of the record/play head.

As the tape is drawn past the erase head each part of it is subjected to an increasing and then decreasing alternating field, as it approaches the gap and then passes it. For example, using a tape speed of $7\frac{1}{2}$ inches a second, each magnetic domain will be subjected to well over 150 reversals of magnetism with a bias frequency of 50,000

KC, as it passes the gap in the head. As it further withdraws from the head, it is subject to the same field but in ever decreasing amounts until finally it drops to zero. The tape is then clean and ready for another recording.

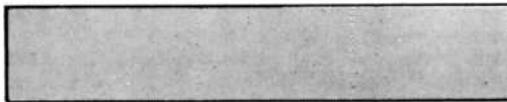
The current in the erase head must be able to produce a magnetic field that is several times the strength of the loudest signal on the tape or erasure will not be complete. Because of the high current requirements the erase head will heat up and, unless it is properly constructed to dissipate this heat, it is possible that the binder on the tape will melt and adhere to the head if the recorder is left in the record mode with the tape in contact with the head and stationary for a period of time.

Both the erase head and the record/play head are constructed along similar lines, though, as has been mentioned the record/play head is the more critical. In each case there are coils of hairlike wire wound on bobbins which slip over core pieces. The cores may be either laminated or solid, the laminated being more expensive because they are more difficult to make.

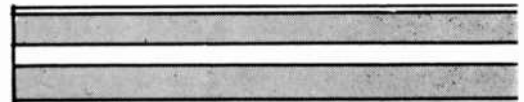
The core is made of metal which is magnetically soft, that is, it is easily magnetized when current is applied to the coils but it will not retain any magnetism when the current has ceased to flow. At the same time, when in the play mode, the core must be responsive to the magnetic domains on the tape as it passes the gap. This sets up magnetic flux in the core which in turn sets up electrical currents in the coils. The output of the coils is fed to an amplifier and speaker for playback.

In recording, current is fed into the coils which causes variations in the magnetic flux, which variations are recorded on the tape as it passes by the gap in the head.

The Full-Track Head



The Half-Track Head



The gap in the record/play head is so small it is imperceptible to the naked eye. It is usually on the order of 0.1 mil—or one ten-thousandth of an inch in length! It takes little imagination to comprehend the fine manufacturing that must be done to hold tolerances on such an infinitesimal space.

The size of the gap determines the frequency response of the head, the finer the gap the better the response on playback but if the head gap becomes too fine then there is a loss of signal-to-noise ratio and also a drop in power output from the head. Thus a compromise must be reached for optimum performance.

The Nortronics Company in its excellent "Tape Recording Reference Guide" says of gaps, "All Nortronics 4-track playback and record/playback have a gap of 0.1 mil. The 2 track and full track heads are normally made with a 0.160 mil gap, for optimum results at 7½ ips. For best results in 4-track recording a separate wide-gap record-only head is desirable. . . . The record-only head has a gap somewhat wider than the combination head or the playback head. The recording operation takes place at the trailing edge of the gap therefore the actual gap length (for a record only head) is not a critical dimension. This gap in a record head is usually between 0.250 mils and 2.0 mils. The wider gap will enable bias flux to be injected into the oxide surface more easily and thereby reduce the oscillator power requirements with an associated improvement in distortion characteristics. The exact value of bias current is also easier to determine on record only heads than for combination record/playback heads."

The configuration of the gap is also of importance. If the gap is too straight from front to back then the magnetic flux lines have a wide path to follow and they do not penetrate the tape in recording. On playback, the currents induced by the passage of the tape are easily shunted and the generation of current in the coils falls off.

On the other hand, if the gap tips are thin with little depth, the abrasive action of the tape will wear them down quickly and the gap will become increasingly wide.

Most head gaps now have a trapezoidal shape which

gives a long wearing surface, providing a uniform gap length over a long period of time before replacement becomes necessary.

The coils, cores and leads are usually encapsulated in a plastic compound and this combination, in turn, is inserted in a metal shield which protects the coils from stray currents which would induce hum. The leads are brought out to pins, to which the leads from the electronics of the tape recorder are attached.

The heads are mounted to the recorder with brackets which are adjustable within a small range to permit the alignment of the head. The gap should be absolutely vertical to the tape edge for optimum results. This is best checked with a test tape since a variation of only a few minutes of arc will affect the performance.

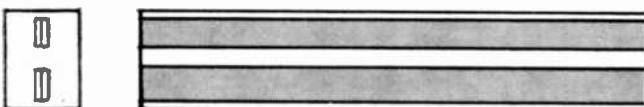
A tape recorder having a head out of line will record and play back its own tapes without difficulty but when an attempt is made to play a tape made on another machine, or a commercially recorded tape, then the volume level will fall off and high frequencies will be lost.

It is not hard to imagine the effect on the head currents if the head is dirty so that the tape does not make good contact with it at the gap. As an example, a separation of only 0.75 mil (¾ thousandths of an inch) between the head and the tape will cause a drop off of 30 db. on everything above 5000 cycles. This is a large enough drop to completely eliminate the hearing of anything above this point.

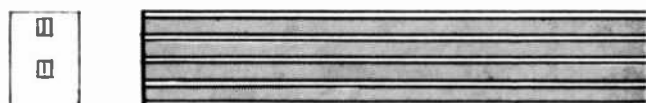
Despite the fact that the heads are made of magnetically soft material they can develop some residual magnetism when subject to heavy currents, especially those generated by switching transients. These usually come about through starting and stopping the recorder while a strong signal is being applied to the head. It can also come about through contact with a strongly magnetized object, such as a magnetized screwdriver. Demagnetizing is easily accomplished by using a head demagnetizer. Heads which have become magnetized will add noise to tapes, especially in the softer passages of music, etc.

(Next month—Bias Current and the Pre-amplifier)

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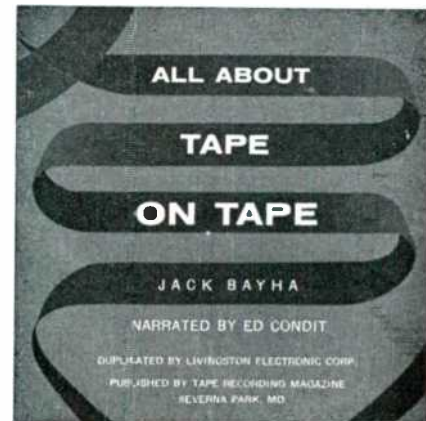
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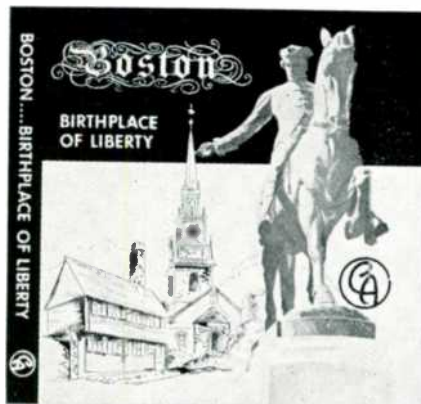
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