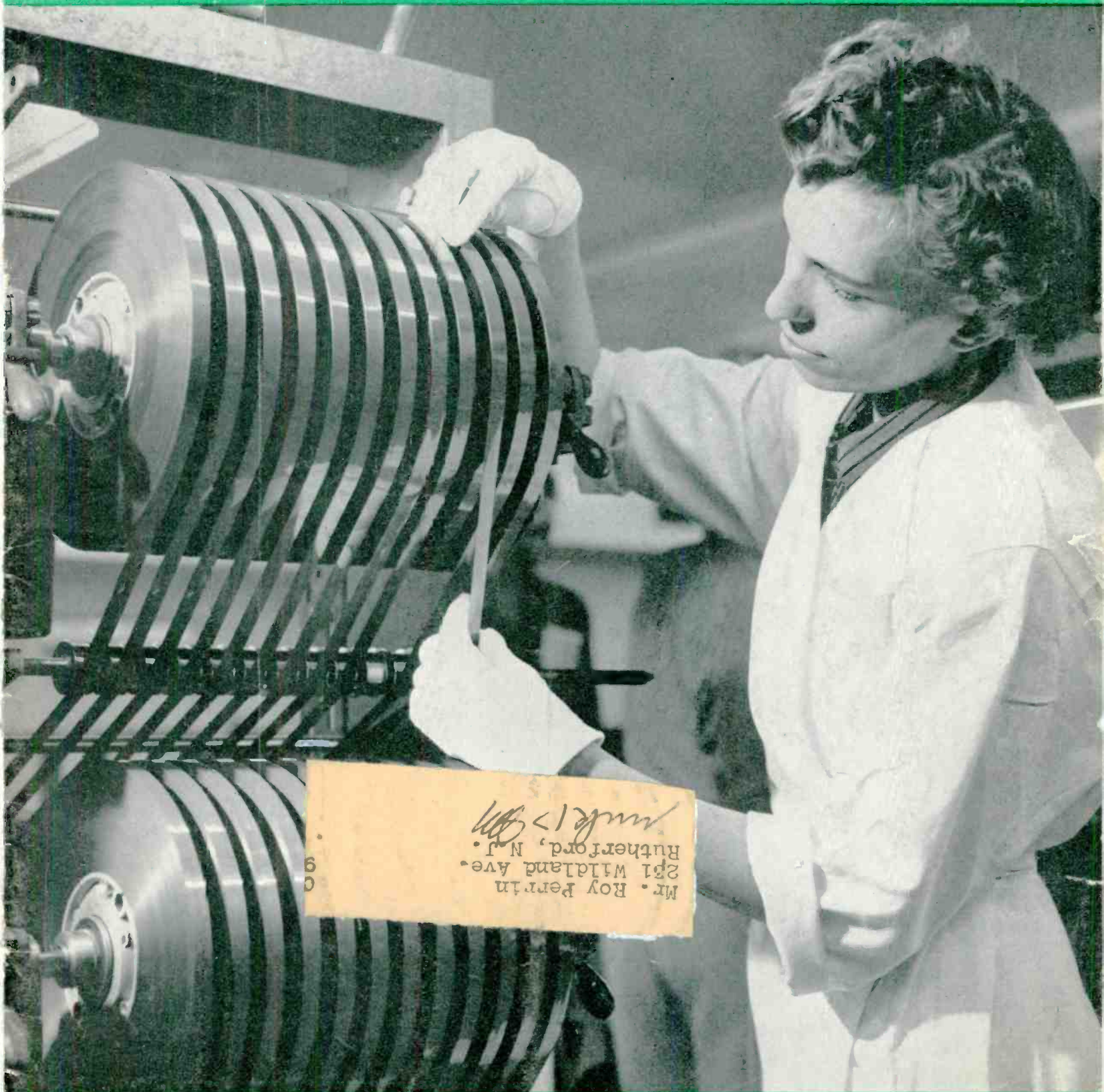


# TAPE RECORDING



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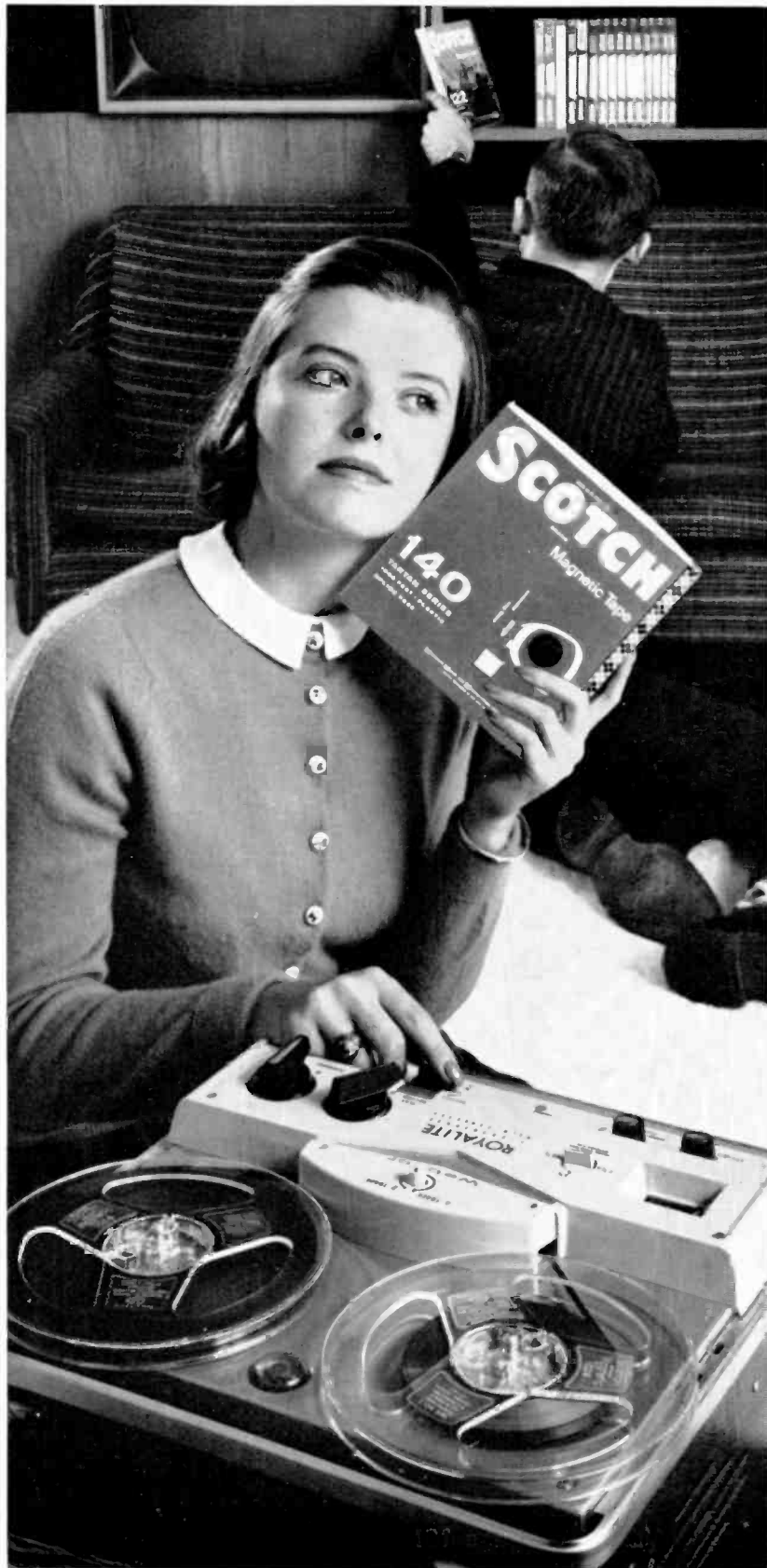
HOW TAPE IS MADE (See page 18)

April, 1961

35c

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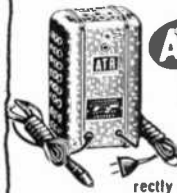
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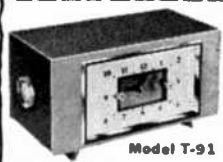
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# TAPE RECORDING

VOL. 8 NO. 5

APRIL, 1961

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Cover Illustration: Slitting tape.



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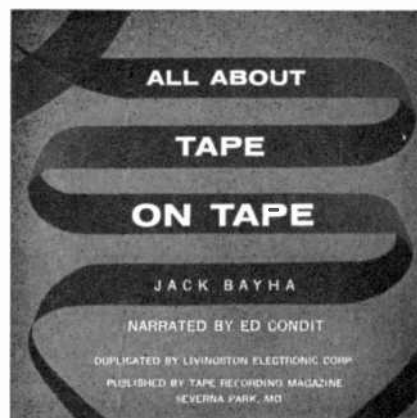
... authored by Jack Bayha ... a book to which you listen ... the first book specifically designed and produced on tape instead of the printed page. ... Now you can actually HEAR what good recording, over-recording, wow, flutter, distortion, wrong mike placement, etc., sound like. A test section allows you to adjust the head of your recorder for best results. Chapters include: How

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- 4—Jazz—Dickie Thompson Quartet—Laura—What is This Thing Called Love
- 5—Jazz—Dickie Thompson Quartet—Misty, Satin Doll
- 6—Dinner-Dance—Jose Melis—Tonight, Am I Blue, White Cliffs of Dover
- 7—Dinner-Dance—Fred Martin Radio Orchestra—Flamingo, Song of India, Symphony
- 8—Dinner-Dance—Fred Martin Radio Orchestra—I've Got Plenty of Nothin', Ebbside, Autumn Leaves
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# NEW TAPES

★—Fair

★★—Good

★★★—Very Good

★★★★—Excellent

## CLASSICAL

Reviewed by Robert E. Benson



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

**BERLIOZ: Requiem, Op. 5**  
 Leopold Simoneau, tenor; New England Conservatory Chorus; Boston Symphony Orchestra conducted by Charles Munch  
 RCA FTC-7000  
 4 track, 7½ ips  
 \$14.95 . . . 82 mins.

Now there are three different versions of the Berlioz *Requiem* on four-track tape. The other two are by Herman Scherchen (Westminster WTP-137, \$11.95) and Fritz Mahler (Vanguard VTF-1610, \$9.95). This new release is the best of the three in both performance and sound, although it falls short of the maximum effect possible because of somewhat limited sound. It is also the most expensive.

Orchestral playing is magnificent, and one cannot help but be impressed by the massed brass in the *Tuba Mirum*. When this recording was made the orchestra was in the center of Symphony Hall in Boston, with the chorus on stage, and one would have expected a more open, resonant sound, particularly in the strings. If only this new recording had the acoustical atmosphere of the long-deleted Columbia set of years ago with Jean Fournet and the Emile Passani Choir and Orchestra.

The disc counterpart of this tape was distorted in some loud passages; most of the distortion has been eliminated from the tape. All-in-all, an admirable enterprise, with a superb performance, disappointing only when one thinks what it might have been sonically.



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

**BEETHOVEN: Symphony No. 9 in D Minor, Op. 125 "Choral" and Leonore Overture No. 2**  
 Suisse Romande Orchestra conducted by Ernest Ansermet with the Chorale du Bras-sus and Choeur des Jeunes de L'Eglise Nationale Vaudoise, and soloists Joan Sutherland, soprano; Norma Procter, contralto; Anton Dermota, tenor; and Arnold Van Mill, bass

LONDON LCJ 80051  
 4 track, 7½ ips  
 \$9.95 . . . 81 mins.

Ansermet's approach to Beethoven is more successful in the less-dramatic symphonies, as evidenced by his fine recording of the 6th and 7th symphonies (London LCK 80052, \$11.95). However, the *Symphony No. 9* is another matter, and this new tape is small-scale Beethoven by any standards, disappointing in both performance and sound. Ansermet's rather superficial reading misses the point of this towering symphony, and the lilliputian sound of the orchestra can't begin to do justice to the magnificence of the work.

The chorus in this new recording is woefully small and unimpressive, although the soloists are good, particularly Joan Sutherland; they deserve to be in a more distinguished production than this. The first three movements of the *Symphony* are on the first track of the tape, with the *Ode to Joy* and *Leonore Overture No. 2* on the over-side. The *Overture* is superior sonically to the *Symphony No. 9*, and as both conductor and orchestra are the same, one wonders what went wrong technically when the latter was taped.

In its disc version, this is the only stereophonic Beethoven *Symphony No. 9* on one record and for that reason might attract disc purchasers. On tape the story is different; the Krips-London *Symphony* performance on Everest TT 43-006 is the equal of almost any interpretation recorded, also including a solid performance of the *Symphony No. 5*. There is no question as to which is the preferred tape.



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

**PUCCHINI: Turandot** (opera in three acts) starring Birgit Nilsson as Turandot; Renata Tebaldi as Liu; Jussi Bjoerling as Prince Calaf and others, with the Rome Opera House Orchestra and Chrous conducted by Erich Leinsdorf  
 RCA FTC-8001  
 4 track, 7½ ips  
 \$21.95 . . . 1 hr. 54 mins.

This recording of Puccini's last opera was on practically every list of the best records of 1960, and it is good to have it on tape. Victor has put it on two reels; the first reel contains Act I only, with a break for reversing the tape. The second reel has the final two acts, each complete on one track.

The star-studded cast has already been discussed back and forth. Birgit Nilsson has a magnificent voice which can easily handle the immense difficulties of the role of the Princess; however, compare her "In questa reggia" with that of Maria Callas on the Angel monophonic recording. The difference is that between one merely singing the written notes, however well negotiated, and one who really becomes immersed

in the part, with as the result a dramatically convincing interpretation. The late Jussi Bjoerling is superb, but the casting of Renata Tebaldi was a mistake; a voice as big as that is not suited to the character of the timid slave girl. Tebaldi's voice is too similar to Nilsson's and the necessary contrast is not there. Ping Pang and Pong sing some of Puccini's most beautiful music, and Mario Sereni. Piero De Palma and Tommaso Frascati could not be bettered in these roles. Alessio De Paolis as the Emperor is a distinct disappointment; he's supposed to sound old, but not *that* old. Erich Leinsdorf keeps things moving, and the chorus and orchestra are fine.

Sonically, the tape is far superior to the disc version, which was distorted in many loud passages. The tape does suffer from pre-echo, which sounds like it is in the master tape. Everything is clear and brilliant, somewhat lacking in resonance. Even with its defects, this is a fine *Turandot*, and it is unlikely there will be a better one for years to come.



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

**LEONCAVALLO: Pagliacci** (complete opera in two acts) starring Mario del Monaco as Canio, Gabriella Tucci as Nedda and Cornell MacNeil as Tonio, and others with the Orchestra and Chorus of St. Cecilia, Rome, conducted by Francesco Molinari-Pradelli

LONDON LOM 90021  
 4-track, 7½ ips  
 \$12.95 . . . 93 mins.

This new recording of one of the most famous of all operas is conveniently fitted onto tape, with the break coming after the *Intermezzo* separating the two acts. Del Monaco's stentorian tenor is ideal for the role of Canio, although marred by excessive theatrics which almost turn this performance into a parody on Italian opera. The rest of the cast is uniformly good.

London has used the stereo medium for maximum effect, with the play within the play in the second act particularly well handled. Although not indicated on either the tape or the package, this tape also includes a brief recital of Italian songs sung by Del Monaco. There was no libretto with the review copy.



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

MEDELSSOHN: Violin Concerto in E Minor, Op. 64  
 PROKOFIEV: Violin Concerto No. 2 in G Minor, Op. 63  
 Jascha Heifetz, violinist; Boston Symphony Orchestra conducted by Charles Munch  
 RCA FTC-2046  
 4-track, 7½ ips  
 \$8.95 . . . 47 mins.

Jascha Heifetz's playing on this new tape is impeccable technically, although he races through the Mendelssohn making it sound quite heartless, rather than the romantic concerto it is. The Prokofiev *Concerto No. 2* is a particularly stunning display of virtuosity. Heifetz recorded this concerto some years ago, also with the Boston Symphony Orchestra, with Serge Koussevitzky conducting. This was at one time issued on a Victor LP, which has now long since been deleted. I prefer the older recording to this new one, primarily because there was more sound to the orchestra and the soloist was better balanced. On the new recording Heifetz is way out front, and the reproduction of the orchestra leaves something to be desired.

This is a prime example of Victor's style of recording the Boston Symphony—a pale sound, with bloodless strings, and little of the resonance of an orchestra playing in a good hall. The Boston Symphony—one of the world's greatest orchestras—deserves better than this.

### SEMI-CLASSICAL



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

### RHAPSODY IN BLUE—AN AMERICAN IN PARIS

Boston Pops Orchestra, Arthur Fiedler, conductor  
 RCA FTC-2004  
 4 track, 7½ ips  
 \$8.95 . . . 33 mins.

This classic rhapsody has for some time been associated with the style of Paul Whiteman and his orchestra, who introduced it to the music public in 1924. Depending on memory alone, there seems to be little difference in treatment and orchestration, but a vast improvement in listening pleasure because of today's superior recording techniques.

Earl Wild, featured pianist with the Fiedler orchestra, for this recording, is a veteran of the Whiteman orchestra and has performed the Rhapsody hundreds of times.

An American in Paris is equally well performed and recorded and is certainly a worthwhile bonus, thanks to quarter track recording.

Technically, the recording is one of the best, more than adequate fidelity and stereo depth and at any rate the music and performance is so compelling it is difficult to find any fault with the recording technique.—C. Parody

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### POPULAR



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

### DELLA BY STARLIGHT

Sequence A: How Did He Look?, More Than You Know, These Foolish Things, Deep in a Dream, Embraceable You, Two Sleepy People

Sequence B: The Touch of Your Lips, How Was Too Good to Me, That Old Feeling, I Had the Craziest Dream, I Wish I Knew, Lamplight

Della Reese  
 RCA FTP-1026  
 4 track, 7½ ips  
 \$7.95 . . . 48 mins.

Della Reese with her flexible style and nimble voice runs through these selections in an everchanging pace that carries the listener from beginning to end in rapt attention.

The first selection "How Did He Look" is presented in an incisive sophisticated style and Della's speech mannerism of clipped enunciation imparts the impression of insincerity appropriate to this typical night club style.

From this extreme posture she descends to an almost cloying sentimental mood with "Two Sleepy People".

All of the selections are top favorite songs and particularly well suited to the unique talents of this performer.

Fidelity is very good and the stereo effect adds the usual impression of "at the scene" listening.—C. Parody



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

### HERE WE GO AGAIN!

Molly Dee, Across the Wide Missouri, Haul Away, The Wanderer, 'Round About the Mountain, Oleanna  
 The Unfortunate Miss Bailey, San Miguel,



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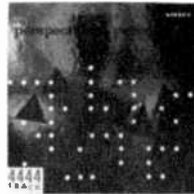
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CAPITOL ZT 1258  
4 track, 7 1/2 ips  
\$6.98 . . . 29 mins.

The Kingston Trio is one reason why folk music is so popular today. Their interpretation of the songs exemplifies the unusual style and talent, not to mention the originality of this most accomplished group.

Their appeal to all age listeners is definite proof of ability and showmanship. This is folk music, well conceived and rendered. Recorded with enthusiasm and radiating plenty of presence—close your eyes and the boys jump right in your room. Interesting stereo effect.—*F. N. West*



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

### PERSPECTIVES IN PERCUSSION

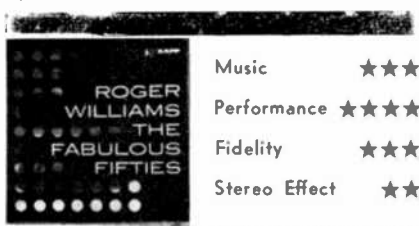
Track A: I'll See You in My Dreams, Then There's Bells, Red River Cha Cha, Night Train To New Orleans, C'est Magnifique, Tampico

Track B: Carioca, Cuckoo Cha Cha, Cielito Linda, Perfidia, Hawaiian War Chant, Bei Mir Bist Du Schon

Skip Martin and Orchestra  
BEL CANTO ST 109  
4 track, 7 1/2 ips  
\$6.95 . . . 34 mins.

Who said cow bells and gourds are musical? Well, these and 18 other percussion instruments ranging from bongos to bamboo rods have been combined in an impressive recording which is not only a delight to hear, but which serves as an excellent medium for showing off your hi-fi system.

Most clearly recorded—frequently close-miked, the sounds are with you all the way. Short organ passages add much to the effectiveness of the presentation. Smart use of microphones makes the stereo effect terrific. A most enjoyable listening experience.—*F. N. West*



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

### SONGS OF THE FABULOUS FIFTIES

Blue Tango, Vaya Con Dios, High Noon, Too Young, Because of You, Song From the Moulin Rouge, Mister Sandman, Wish You Were Here, Mona Lisa, Goodnight Irene, Secret Love, Love Is A Many Splendored Thing, Moonglow, Theme From Picnic, Unchained Melody, Tennessee Waltz, Hey There, April in Portugal, My Heart Cries For You, True Love, La Vie En Rose, Three Coins in the Fountain, Young At Heart, I Believe, Autumn Leaves

Roger Williams  
KAPP KT45008 (Twin Pak)  
4 track, 7 1/2 ips  
\$11.95 . . . 73 mins.

Every tape featuring Roger Williams I have had the pleasure of listening to is perfectly delightful, the music flows so evenly under Mr. Williams' artistry. No matter what you may be engaged in at the time you hear the music it seems to lighten your task.

True professionalism on the piano keyboard is not always easy to come by. Most players are talented amateurs. But Roger Williams is a professional in every sense of the word.

His arrangements as well as his playing can make an insignificant pop tune sound like an all-time hit.

This tape contains over an hour of music which is good listening from start to finish. Fidelity is as fidelity should be. Clear, distinct, melodic sound which, on tape, can be played again and again and again for countless times without deteriorating one bit.—*J. Cover*



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

### ONLY THE LONELY

Only the Lonely, Angel Eyes, What's New, Willow Weep For Me, Good-Bye, Blues in the Night, Guess I'll Hang My Tears Out to Dry, Ebb Tide, Gone With the Wind, One For My Baby

Frank Sinatra; orchestra conducted by Nelson Riddle  
CAPITOL ZW 1053  
4 track, 7 1/2 ips  
\$7.98 . . . 45 mins.

I have never been and still am not a fan of Mr. Sinatra's shaky singing. Ever since he first started his career as a bobby-sox idol, I have felt, and still do, that his voice is certainly not of professional quality—it is mediocre to say the least, and I cannot understand his following at all. I truthfully feel he is a much better performer as an actor than a singer. Of course, he is best of all as a publicity seeker.

If you listen carefully to his voice, you will note how Mr. Sinatra strains for a high note and if he can't reach it, he changes it to suit his voice, not the music. This is especially evident on Ebb Tide.

But—and this is a big but—he has somehow acquired the most influential acquaintances in the professional world and some of the most talented. Among these is Nelson Riddle whose arranging and conducting of the orchestra on this tape is quite professional and extremely good. He makes Sinatra sound good.

The music is slow and blusey. You sort of feel Sinatra is carrying a torch for all the females of the world. After awhile, you find yourself beginning to yawn.

You can definitely hear him predominantly on the left channel. Other than this, fidelity is smooth and clear and Capitol's recording technicians do a fine reproduction job.—*J. Cover*



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

### THE MUSIC OF RICHARD RODGERS & THE MUSIC OF HAROLD ARLEN

Richard Rodgers: Something Wonderful, Falling in Love With Love, I Could Write A Book, My Funny Valentine, If I Loved You, It Might As Well Be Spring  
Harold Arlen: That Old Black Magic, Stormy Weather, I've Got The World On A String, Come Rain Or Come Shine, Over



the Rainbow, Happiness Is Jes' A Thing Called Joe  
 Poliakin conducting his orchestra and chorale  
 EVEREST T-41066  
 4 track, 7½ ips  
 \$7.95 . . . 34 mins.

Both Richard Rodgers and Harold Arlen have written songs that last—not the raucous, gaudy rock and roll bits that are so prevalent today and which become tiresome after a month or so. Thank heaven even these are slowly disappearing from the scene.

A good tune never really fades into nothingness, but is played now and again year after year—and this is so with many of Rodgers' and Arlen's compositions.

On this tape Poliakin conducts a 54-man orchestra and a 20-voice choir. The stereo effect is excellent as is the arranging technique used on the songs. All too often I have pointed out that sometimes full orchestras and over-arranging can so mutilate a song, it is hardly recognizable, but this is not true in this case.

Fidelity of the highest.—*J. Cover*

## SHOWS



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

## TAKE ME ALONG

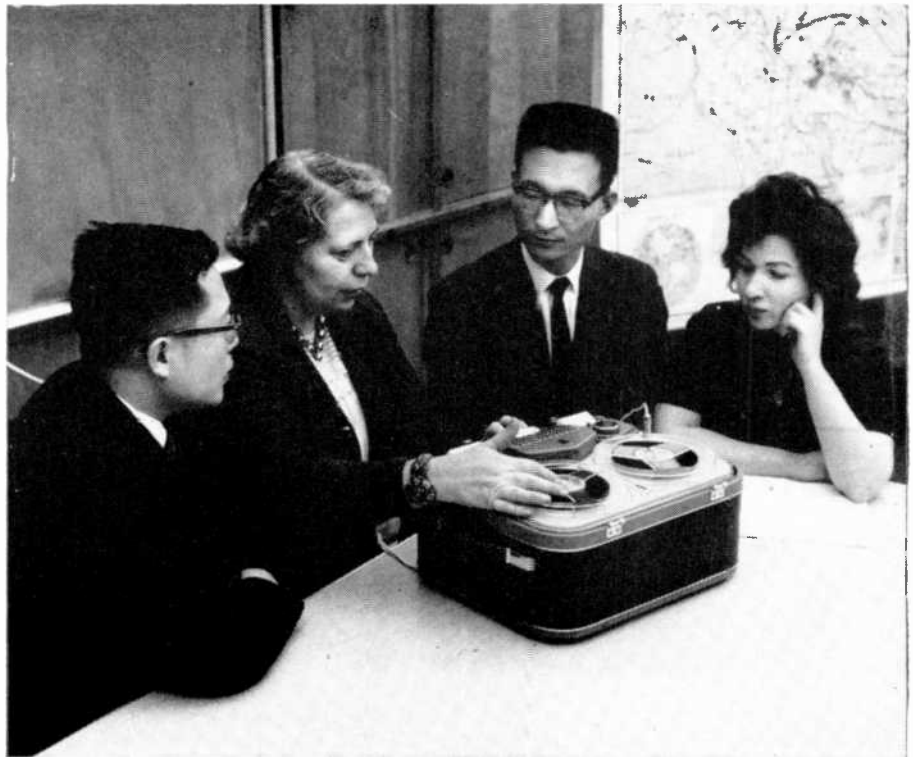
Sequence A: Overture, The Parade, Oh, Please, I Would Die, Sid, Ol' Kid, Staying Young, I Get Embarrassed  
 Sequence B: We're Home, Take Me Along, Volunteer Firemen Picnic, Wint's Song, That's How It Starts, Promise Me a Rose, Reprise: Staying Young, Little Green Snake, Nine O'Clock, But Yours, Finale  
 An original cast recording of the Broadway show starring Jackie Gleason, Walter Pidgeon, and Eileen Herlie  
 RCA FTO-5000  
 4 track, 7½ ips  
 \$8.95 . . . 45 mins.

If you can't get seats for the Broadway show, the next best thing is having this tape bring the show right in your living room. It would be hard to say whether Gleason was made for the part or the part was made for him. Walter Pidgeon turned out to be a good vocalist. It is worth the price of the tape to hear Eileen Herlie sing (with Gleason) "I Get Embarrassed".

Good tunes—good artists—excellent recording. All add up to a pleasant 45 minutes of pure enjoyment. This is a desirable addition to every library of Broadway shows and music.—*F. N. West*



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



DR. IRENE CYPHER, Associate Professor of Education at New York University, past-President of the METROPOLITAN AUDIO VISUAL ASSOCIATION, and A-V Editor of INSTRUCTOR Magazine, demonstrates the unique advantages of the NORELCO 'Continental' Tape Recorder to a group of student teachers at N.Y.U. Selection of the NORELCO for inclusion in the exhibits in N.Y.U.'s "Model Classroom" was based upon performance standards of fidelity, reliability, versatility and functional simplicity. The NORELCO 'Continental' is a product of North American Philips Co., Inc., High Fidelity Products Division, Dept. 1P4, 230 Duffy Ave., Hicksville, L. I., New York.

## MORE SONGS FROM GREAT FILMS

All the Way, An Affair To Remember, Around the World, But Not For Me, Anna, The High and the Mighty, Auntie Mame, Separate Tables, Secret Love, April Love, A Certain Smile, Love Is A Many Splendored Thing  
 The Clebanoff Strings and Orchestra  
 MERCURY STC 60162  
 4 track, 7½ ips  
 \$6.95 . . . 38 mins.

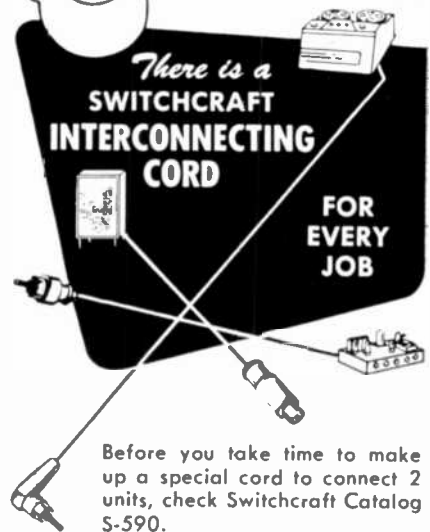
This is the fourth offering by the Clebanoff Strings and will delight the legion of tape playing fans who like movie theme music. A luscious bill of fare of well recorded, smooth silky strings, now has the addition of brass, which creates added tonal coloring and full orchestra effect. Just right—not strident—the kind of music you sit back and enjoy knowing full well the recording engineers have done their work with finesse. Good listening, balance, — everything's in this one.—*F. N. West*

## NEW TAPES RECEIVED

REEL-TO-REEL  
 RCA, FTP-1001, On Tour, The New Glenn Miller Orchestra, 4 track, 7½ ips.  
 RCA, FTP-1005, Show Stoppers in Dance Time, Frankie Carle, His Piano and Orchestra, 4 track, 7½ ips.  
 RCA, FTP-1003, The Ames Brothers Sing the Best in the Country, 4 track, 7½ ips.  
 Vox, XTC-77, Gypsy Magic, Magic Tzigane, 4 track, 7½ ips.

## DON'T WASTE TIME

# MAKING CONNECTING CORDS



Before you take time to make up a special cord to connect 2 units, check Switchcraft Catalog S-590. Over 190 Molded Cables with different type connectors and lengths.

Contact your local Hi-Fi specialist or write for catalog S-590 and name of dealer nearest you.

**SWITCHCRAFT**  
INC.

5589 N. Elston, Ave., Chicago 30, Ill.  
 Canadian Rep: Atlas Radio Corp., Ltd.,  
 50 Wingold Ave., Toronto.

# CROSSTALK

from the Editors

WE WONDER WHY? Just the other day we came across a chart showing the ups and downs of the number of people employed over the last few years. The last big drop was in 1957-58 according to the chart. This, oddly enough, coincided with the heyday of the tape recorder, with numerous companies offering musical tapes and almost all of the companies doing a great deal of advertising.

\* \* \* \* \*

ACCORDING TO THE powers that be, the economy is now in a somewhat similar situation with too many unemployed. Will increased activity in tape recorders come about again? From all indications it very well might. More and more people are installing tape decks in their present disc-type hi-fi rigs, tape in the schools has taken off like a rocket, trade journals are climbing on the band wagon and are telling their readers that tape is getting ready for another big jump.

\* \* \* \* \*

THEIR ARE SIGNS that all this may be true. More and more people are becoming aware of the better quality and lasting qualities of taped music. The library of music available and the constant outpouring of new numbers has now made it possible to get anything from Bach to bebop. And the economy of four-track has brought the price down to within reason. This, plus the manifold uses of the recorder in the home, in school and in business has made its purchase a good investment.

\* \* \* \* \*

ALL OF THIS the public is getting to appreciate and is responding by buying the equipment offered by the manufacturers. The entrance of new companies into the tape field, the latest being the announcement that Eastman Kodak will manufacture tape, also points up the expanding growth. Tape recorders are now moving out of the "gimmick" category and into the range of accepted products and things to have like automobiles, washing machines and electric heat.

\* \* \* \* \*

WE RECALL THAT the Packard Motor Company had a slogan "Ask the Man Who Owns One." This seems to be taking effect in the tape recording field for the best salesmen the industry has are you, our readers. A survey we made some years back, among our readers, showed that something like 42% of the people who had bought new recorders had done so after seeing and hearing one in the home of a friend. We'll bet that you have been responsible for the sale of at least one machine by recommending tape recording to one or more of your friends because you knew the fun and pleasure you derived from your own machine. The prospective owners "Ask the Man Who Owns One."

\* \* \* \* \*

THUS, EACH NEW machine that is sold generates another sale. As the number of machines increases it makes it more profitable for tape companies to lower their prices because production is greater, more and more musical tapes become available as the market for them widens. This, in turn, makes the ownership of a recorder even more worthwhile . . . and so it goes.

\* \* \* \* \*

WE HOPE THE industry will sieze this opportunity to keep the present movement forward in high gear to the ultimate benefit of everyone.

\* \* \* \* \*

ANOTHER ASPECT of magnetic growth on the horizon lies in the field of magnetic sound on movie films, Kodak has just announced a new Kodachrome II film which has higher resolution power and greater speed than the older product. This will mean better 8 mm movies, in fact some claim has been made that 8 mm will become the equal of 16 mm. This should increase the interest in magnetic recording for all those who now shoot home movies.

# INDUSTRY NEWS

BEL CANTO is stepping up its merchandising with two new appointments to its field force. They are Sheldon Tirk, formerly a Mercury Branch manager who will assist sales manager Pete Fabri and Warren Gray who will become western states regional manager. The firm is also planning to give to dealers a free demonstration tape with each dozen reels purchased from its February release and the plan will continue in the future. Also offered to dealers is a free browser rack and window streamers.

MERCURY RECORDS has signed with Bel Canto granting exclusive distribution rights to Bel Canto to the entire Mercury catalog in the United States. This will use Bel Canto's three-way distribution through photo stores, parts dealers and record shops, as well as the present Mercury distributorships.

The arrangement is mutually satisfactory since Bel Canto works through channels other than those used by record companies.

AUDIO DEVICES received an award from Industrial Photography Magazine for its imaginative use of photos in its annual report.

AMPEX will merge its audio and professional products division. Ampex Audio makes the consumer products and the Professional Products markets a line of recorders for institutional use. The consolidation will permit combination of the marketing operations since some of the lower-priced pro machines overlap into the consumer market.

EASTMAN KODAK will go into the manufacture of magnetic tape later this year. The initial offering will be quarter-inch tape on a tri-acetate base but later the firm will go into tapes for instrumentation and other uses. The regular distribution organization of photographic dealers will handle the sale of the new tape to the consumer market while the motion picture division of the company will handle the sale of Kodak tape to the professional trade.

Kodak's European subsidiary, Pathé has been making and selling tape on the continent for more than 12 years. For the last 8 years Kodak has been coating magnetic tracks on movie film with their Sonotrack processes. Kodak has also been a large supplier of base materials for other tape manufacturers.

FERRODYNAMICS is looking for talented performers who have not yet established a national reputation but whose performances are equal to the best known names in the industry. The firm is now recording a number of releases, to be issued later, of material which will be available only on tape and not be material which is first issued in disc form and then the rights are acquired for tape release.

According to Fred Kantor, president of Ferrodynamics, the market for tapes is much larger than was generally believed

and is increasing as hi-fi hobbyists become aware of the superiority of tape in both permanence and lack of surface noise.

He said the market is more discriminating than the broader group of disc listeners. The first recording session was devoted to Bob Harter singers performing catches, rounds and glees by Henry Purcell.

RHEEM CALIFONE, manufacturers of language lab equipment have brought out their own name brand of recording tape. They have ten different kinds of tape available in Mylar and acetate base.

THE TALL COMPANY, makers of the EdiTall Splicing blocks, have opened new offices at 27 E. 37th Street, New York City.

UNITED STEREO TAPES has introduced a low-priced sampler series. Each tape contains 30 minutes of music and will retail for \$3.95. Each sampler is devoted to one of the four basic types of music—pops, classical, jazz and sound sensations that are represented in the line.

LOS ANGELES hi-fi show to be held at the Ambassador Hotel, April 3 to 10 will devote the first two days to dealers.

WEBSTER ELECTRIC, using a portable teaching unit for demonstration to educators found so much interest displayed in the unit itself that they have now made it part of their regular line of language lab equipment. It has become the Model 370 Portable Student Lab and is complete in one case. It is a two-track unit capable of recording or playing back either track independently.

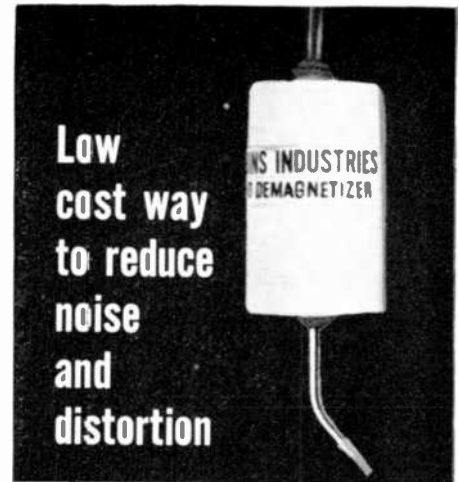
TAFT-PIERCE Mfg. Co. of Woonsocket, R.I., has developed a process for the fine finishing of tape heard which have metal pole pieces imbedded in epoxy resin. It is claimed that the use of their Microstoners will prevent smearing the metal into the resin when finishing. Only 5 to 10 seconds of stoning is necessary.

CONCERTAPES is now geared for an intensive push in tapes and discs with the appointment of Fred Cassman, former Columbia branch manager and Chicago branch manager for Everest Records, as new sales manager. Twenty-five new distributors have been appointed to handle the line. The first new release is scheduled for March 1.

WEECOR is offering a free Keystone motion picture camera with the purchase of their Regent tape recorder.

SHURE BROTHERS vice president Vic Machin was awarded a plaque by the Associated Police Communications Officers, Illinois State Chapter in recognition of 20 years service to the radio communications industry.

It is reported that the West German Association for the Performance and Mechanical Reproduction of Music has filed two suits against Grundig, in Germany. The first suit demands a million marks in lieu of lost royalties and the second demands the names of persons buying tape recorders.



## ROBINS HEAD DEMAGNETIZER

**Model HD-3** If noise and distortion are impairing reproduction of your favorite tapes—there is a good chance your recording head is magnetized. By removing permanent magnetization, Robins HD-3 dramatically reduces noise and distortion—thus restoring listening pleasure. No tape recordist should be without one.

American-made, the low-cost HD-3 is designed for both stereo and mono recorders. A specially shaped probe makes any tape head easily accessible.

**only \$5.95**

See it at your hi-fi dealer, or write for free catalog.

ROBINS INDUSTRIES CORP. Flushing 54, N. Y.

## TAPE RECORDERS



**HI-FI COMPONENTS SLEEP LEARN KITS**

MERITAPE Low cost, high quality recording tape. In boxes of cans. Unusual Value FREE 1961 CATALOG

Dressner, 1523AA Jericho Tpke., New Hyde Park, N. Y.

**LOOKING FOR LOW HI-FI QUOTES?** STEREO TAPES and RECORDERS. ORGAN'S COMPONENTS. BUILT 1932 EST. 1950. Send us YOUR list. Free Bargain Sheet and Tape Cat. 1373-TR EASTON RD., ROSLYN, PA. "THE BRAND NAME STEREO SPECIALIST"

The association wants every tape recorder owner to pay a tax each year on the assumption that each owner will, at some stage, copy music from the radio or from records borrowed from friends.

They propose that the recorder manufacturer be required by law to report all tape recorder sales to retailers who, in turn, would be required to report the names and addresses of all private persons who purchase recorders. Grundig contends that such procedure is unconstitutional.

STANCIL-HOFFMAN has moved its administrative offices to its new office building in Hollywood. The move was made to permit expansion of production facilities to take care of a 35% increase in business so far this year.

## OVER 50% OFF

2-Track Stereo Tapes  
7½ ips—Inline—Open Reel  
Over 850 titles in stock. Satisfaction  
guaranteed! Catalog \$1.00 — re-  
funded first order.

### CAL-WESTERN STEREO

P. O. Box 299  
Aptos, California

### A NOTE TO THE HI-FI BUYER

AIR MAIL us your requirements for an  
IMMEDIATE LOWEST PRICE QUOTATION  
Components, Tapes and Recorders  
SHIPPED PROMPTLY AT LOWEST PRICES  
WRITE TODAY FOR FREE CATALOG

### AUDIO UNLIMITED

190—T Lexington Ave.  
New York 16, N. Y.

### NEW MAGNETIC TAPE GUIDE CONNECTOR

A Threader designed to properly connect tape to  
reels. No more fumbling with distal threading.  
Holds loaded reel from spilling. Attaches to tape  
with its own adhesive tongue.  
Satisfaction guaranteed or money back. Send \$1.00  
for 5 connectors, \$1.50 for 10.

TUNETIME RECORDING ENTERPRISES  
P. O. Box 652, Adelaide St. Postal Stn.,  
Toronto, Canada

### MOVING?

If so, please notify us in advance of your  
change of address so you will not miss  
an issue.

TAPE RECORDING  
Severna Park, Md.

## TRIPLE TREAT

### 3 SOUND STORY tapes . . .

The newest in creative recording,  
for only **\$2.50**

All on 3" reels, 7½ ips.

No. 1—Dr. Valdimir A. Ussachevsky. Alters  
sounds to produce new and unusual sounds;  
Tony Schwartz, Sounds of New York City.

No. 2—The Contact Microphone, A hilarious  
creative tape you have to hear to appreciate.

No. 3—Beat Recording, Authentic Beatniks  
live it up—or down, as the case may be.

No. 4—Africa. Recorded Tribal Dance and  
songs made in some of the wildest parts  
of the Dark Continent.

Order your set today  
Use the handy order blank below.

TAPE RECORDING Severna Park, Md.

Please send me the Sound Stories checked  
below (3 for \$2.50)

Circle numbers desired

1    2    3    4

I enclose \$.....

Name .....

Address .....

City ..... Zone .... State .....

## FEEDBACK

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

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

### Box Data Missing

To the Editor:

When will we get adequate data on the  
outside of the tape box (which comes to  
marker sealed shut) about the tape re-  
cording hidden inside? Even in cases where  
the box is not sealed, the data inside is fre-  
quently inadequate. I think it's important  
to know what is on side #1 and what's  
on side #2. To me, next to the quality,  
the best thing about tape is its continuity.  
When a work begins on side #1 I like  
to know before I buy that it ends there  
whenever it is feasible. Until they supply  
the information it would be helpful if you  
could include it in reviews.—*Edwin H.  
Hess, Richmond Hill, N.Y.*

### Dealer Will Demonstrate

To the Editor:

We have just received our supply of  
TAPE RECORDING.

As usual, I took the first magazine home  
to read and I read a very interesting let-  
ter in the feedback column in reference  
to stereo tape.

Mr. J. Emmett Cade of Weswood, N. J.,  
is so right in saying no dealer will test a  
tape for a customer, but will let a cus-  
tomer hear a record.

From this day on we will demonstrate  
all our 4 track stereo tapes so the customer  
may make his selection.

Thanks to Mr. Cade and the staff of  
Tape Recording Magazine for opening our  
eyes.—*Seymour Goldberg, Milo Trading  
Corporation, 215 Fulton Street, New York,  
N. Y.*

### Long Time Tape Fan

To the Editor:

The Story of Magnetic Tape on page 16  
of your February issue interested me very  
much.

I lived in Cleveland, home of the Brush  
Development Company in those days and  
ordered one of their "Sound Mirrors"  
in 1944, which was delivered in 1946.

The purpose of this letter is to relate  
an incident which you might find amusing.  
At that time, before the advent of the plas-  
tic reel, Brush was having a hard time  
securing steel and, although they had  
plenty of tape, they couldn't supply it on  
reels. I then conceived the idea of using  
8 mm movie reels and immediately visited  
every camera shop in the city, ending up  
with about 550 of them. I bought from  
Brush, much to their amazement, 500  
"pancakes" (their name for 1250 ft. of  
black oxide paper tape on cardboard axels  
without reels) which I proceeded to wind  
onto my movie reels. By the time they had  
found out what I had done they were  
begging me to sell it back to them. I had  
already used it all in converting my rarest  
disc recordings to tape and subsequently

went on to build the largest library of  
classical music on tape in existence (over  
1700 reels in August 1952).

Now I live in Sarasota, Florida where  
very few people know what good repro-  
duction of music is and most are apt to  
regard "Hi-Fi" as a piece of furniture. My  
stereo (Ampex and Altec) equipment I  
consider unsurpassed but although the pre-  
recorded stereo tapes far outshine those  
I made in the old days, I will always miss  
that feeling of pioneering in and being  
able to improve on the sounds which  
emerge from that inscrutable ribbon.—  
*Richard H. Cobb, Jr., Sarasota, Florida.*

Thanks to old-timer Mr. Cobb for this  
highlight on the early days of tape. Imagine  
waiting for two years for delivery of a re-  
corder and then having to go to so much  
trouble to obtain tape for it.

### Dubbing Discs To Tape

To the Editor:

In answer to W.H.H. in the January  
issue, he is not recording mono records in  
stereo but recording both tracks with the  
same signal. The same results can be had  
by playing half-track tape through two  
amplifiers, thereby doubling the playing  
time of the tape.

This may be of interest to your readers.  
In dubbing discs to tape for a 3¾ ips  
continuous tape player, I run my table at  
66⅔ RPM and run the recorder at 7½  
ips. When played back at 3¾ ips there  
is very little wow and the change in  
equalization is not noticeable. Also by run-  
ning the recorder at 15 ips, 7½ tape can  
be dubbed in half the time. I also use this  
method for cutting talking book discs on  
standard equipment. I will be glad to give  
information on converting the G-Rek-O-  
Kut transcription table for any desired  
speed to any reader who desires it. Have  
been a subscriber for a long time and enjoy  
your magazine very much.—*J. R. Quisen-  
berry, 4725 E. 52nd Place, Maywood, Cal.*

### Tape Speeds Are Confusing

To the Editor:

January's Crosstalk on tape speeds causes  
me to bemoan out loud (before only to  
those of my circle) the unfortunate stand-  
ardization of present speeds based on an  
original 30 inches per second. Wouldn't  
it have been great if they'd started with  
32?—32—16—8—4—2—1—½—¼? I  
suppose, like spelling, and the calendar  
and metric measure adoption, the fustest  
is what we're stuck with.

Tape recorders fascinate me the way  
hot rods and custom cars fascinate their  
followers. Would like to hear of a feasible  
"Ideal" tape recorder with the best features  
put together. In theory and practice—if  
anyone has hybridized two or more makes  
successfully.—*Michael Ivor, Phoenix, Ari-  
zona.*

Just suppose they had started with 31⅞  
—Ed.



# QUESTIONS AND ANSWERS

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

## Oxide Comes Off

**Q**—Here is a problem I am sure many recordists have that like to keep their tapes neat, and that is how to keep the red iron oxide of the magnetic tape from getting all over the white leader strip spliced at the ends of the magnetic tape. After awhile the red oxide builds up to a point where it practically obscures whatever is written on the leader tape. Do you know of any method by which these particles can be prevented from coming off that, of course, will not harm the tape heads.

Also could you send me a list of stereo test tapes now available and their contents?  
—R. D. S., Franklin Square, L. I., N. Y.

**A**—If the oxide comes off the tape it indicates that the tape is defective or the binder has dried out. Some oxide shedding is normal but it should never approach the amount you describe.

Regarding test tapes, any standard test tape should do as well for stereo as for monaural. Livingston Audio Products, 147 Roseland Avenue, Caldwell, N. J. makes a test tape which might serve your purpose.

## Echo Chamber Effect

**Q**—I am interested in converting my recorder to have an echo chamber effect. A friend of mine told me that I could do this by interchanging my erase head and record/play heads, removing the leads from the erase head and connecting it to a mixer along with a microphone. I would appreciate your opinion on this.—R. L. B., Levittown, Pa.

**A**—In order for a head to do any recording it must be fed from a recording preamp and, to make the recording have good quality, it must also have a bias current included. The recording preamp has the bias current supply built-in. This is mixed with the signal from the mike and

both are fed to the recording head at the same time.

Just connecting a microphone to a head will not produce a recording. In addition, a record/play head has different electrical characteristics than an erase head and also, usually, has a narrower gap.

If you want the echo chamber effect we would suggest you get it by adding a third head to your machine rather than disturbing the ones you now have. This head must be connected to a preamp and its output fed to the record head along with the signal coming from the mike. The spacing between the two on the deck will determine the delay.

## Tape Storage

**Q**—Could you tell me the best way in which to store my two and four-track stereo tapes. I have about 200 reels.—H. S. W., New York, N. Y.

**A**—A cabinet, either of wood or metal, with shelves spaced about 8 inches or so apart should do very well as a storage medium. Perhaps you could pick up an old bookcase that might be suitable—or a new one for that matter.

The important thing is to store the reels on edge—not flat as the pressure induced in the bottom reels by a big pile of them may be sufficient to warp them and cause trouble.

Beyond this, very little care is needed except the normal custom of keeping the tapes in their boxes when not in use. The tapes should not be subjected to extremes in temperature (don't put the cabinet over a radiator, for instance) and should store in good shape for years and years at normal room temperatures and humidity. The chance of the tapes coming into contact with strong enough electrical fields is remote in a house or apartment and this is about the only thing that can do damage to the tapes. The tapes should not be too tightly wound on the reels but if your

**RECORDING TAPE**

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

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1200' MYLAR, 1/2 mil, 5" reel	1.29
1200' Acetate (plastic), 7"	1.29
1200' MYLAR, 1/2 mil (strong)	1.35
1800' acetate (plastic), 7"	1.79
1800' MYLAR 1 mil thick, 7"	2.29
2400' MYLAR, tensionized, 7"	2.69
2400' MYLAR, tensionized, 7"	3.49

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**COMMISSIONED ELECTRONICS CO.**  
1776 COLUMBIA ROAD WASHINGTON, D. C.

machine is in adjustment there is no worry on that score either.

## Wants Monaural

**Q**—Where can I buy monaural tapes? I have a Wollensak 1500 and do not want stereo. Have been buying "bargain prices!" Mylar tape which sounds good to me. Are the name brand tapes so much superior and worth the difference in cost? Where can I have some of my tapes duplicated and approximate cost? Seems to me there are more monaural recorders owned than stereo so why are all the tapes available locally only stereo and costly if used on my machine. I buy records now and tape my own but I'd rather buy tape.—C. L. Barringer, Jr., Rocky Mt., N. C.

**A**—Monaural tapes have been off the market for some time but, as an experiment, some tape "singles" are now becoming available. These are full track tapes on three inch reels which sell for \$1.00 and have about ten minutes of music on them. See the ad on page 5. If there is enough interest shown, there will be more of these tapes. For duplicating services see the Shop or Swap Department.

Regarding bargain price tapes, you may be getting a good buy and you may not. Read the article on tape manufacturing beginning on page 18, especially the section dealing with the tests which the standard brand tapes are subjected to before being placed on the market. Many bargain tapes have failed to live up to one or more of these tests and may even be tape that has been used and erased.

# BOOK REVIEW

**LANGUAGE AND LANGUAGE LEARNING:** Theory and Practice, by Nelson Brooks. 238 pp. Published by Harcourt, Brace and Company, New York, 1960; \$3.50.

This book is probably the best single all-around source currently available for generalized information on language, as such, and classroom teaching of languages. Any person undertaking a study of languages and the theory and practice of language teaching would do well to begin here.

In his first three chapters, Brooks summarizes very well much of current thinking regarding the theory and function of language.

In following chapters he reviews current theories of language learning and teaching,

and then moves on into the organization of the language course, the classroom, and the language laboratory as used in conjunction with current classroom language teaching methods.

Brooks concludes with a brief but stimulating and challenging chapter on "Building A Profession" in a broadened and professionalized field of the theory and practice of language and language learning; which he proposes be called *linguistics*.

The book is well supported by two appendixes and an excellent bibliography covering significant works in the field over the last 70 years. Appendix A is entitled, "How To . . .", and contains much practical information which should prove valuable to beginning language teachers and those con-

verting from the older grammar-translation methods. Appendix B is a glossary of terms—many of them unusual—which should prove of equal value. The excellent index will facilitate use of the book as a reference work.

Unfortunately, LANGUAGE AND LANGUAGE LEARNING does not deal at all with teaching machines or the newer concepts of programmed learning as they affect language learning and teaching. Nonetheless, this book will undoubtedly remain of value for years to come until programmed learning methods and teaching machine become sufficiently generalized to make serious inroads on current classroom methods of language instruction.—R.C.S.

# NEW PRODUCTS

## NEW CONCORD RECORDER MODELS



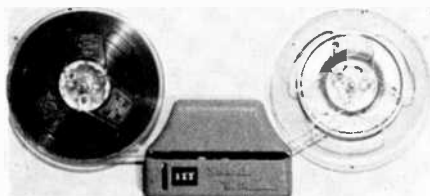
Concord Electronics announces 4 new tape recorders. There is a new improved stereo version of the successful Concord 107, which is now marketed at the 107S and which has a companion amplifier-speaker unit available designated the 107SA. Use of the two units will afford stereo recording and stereo playback.

A complete self-contained professional stereo recorder, having the widest range of features, the Concord 880 sells for \$399.

A professional stereo tape deck and pre-amplifier combination, designated the Concord 401 is designed to complete any home stereo system.

Concord also markets its new battery operated portable, the Model 500, with many exclusive features such as remote control operation from a microphone switch. For further information and additional prices, write Concord Electronics Corp., 809 North Cahuenga Avenue, Los Angeles 38, California.

## LANGUAGE LABORATORY RECORDER



The Stancil-Hoffman Corp., 921 N. Highland Avenue, Hollywood 38, Calif., has announced a new language lab recorder, Model LL1. The unit has two tracks on standard 1/4 inch tape. The number one track generally carries the lesson material to which the student listens. Number two track records both this material and the student's response. The functions of erase, record and playback can be separately activated for either one or both tracks. Safety measures are incorporated to prevent erasure of the number one lesson by having it under the control of the instructor's console. The second track may be erased and re-recorded at the student's command. The equipment is designed to operate in either a horizontal or vertical plane. Most installations in student booths leave only feed and take-up reels exposed. It is easily threaded. Two knobs are mounted on the left side of the mechanism only. A tape sensing device programs the tape operation as a function of direction and speed. Three separate motors are used. Frequency response is flat to 10,000 cycles and wow and flutter is less than 0.2%. Contact the manufacturer for full details.

## AMPLIFIER CORP. DEGAUSSER



The new demagnetizer for bulk sound recording tape offered by the Amplifier Corp. of America, 398 Broadway, New York 13, N.Y. completely erases tape on the reel, without rewinding and demagnetizes record-playback and erase heads. The erasing process is so efficient that, even on severely overloaded tape, the background noise level is lowered 3 to 6 db below that of unused tape. Since the device is light and portable, it is easily applicable to demagnetizing record-playback and erase heads, thereby reducing background noises and tape distortion.

It operates on any alternating (50 or 60 cycle) current and is easy to use. To erase, you simply place the demagnetizer on top of, and move it around the reel of tape slowly. It has a momentary push-button control safety on-off switch and is equipped with an 8-foot line cord, molded rubber plug and operating instructions.

Called the "Magneraser," it is available

in two models: Magneraser Model 200C for 100-130 volts; Magneraser Model 220C for 200-260 volts. The price of either is \$24.00.

## NEW SARKES TARZIAN TAPE



A new recording tape division has been organized by Sarkes Tarzian, Inc., Bloomington, Indiana, and they are marketing a new tape which, according to the manufacturer, has a virtually flat response for all recording frequencies, with distortion less than 2 1/2% at maximum record levels. Uniformity within an entire 1200 foot reel is said to be within plus or minus 1/4 db. In addition, a new oxide formula and special selectivity of oxides protect recording heads from wear and prevent abrasion; special coating, priming and binding techniques improve resistance to humidity and temperature changes; and high tensile strength base reduces tape breakage to a minimum. For more information and prices, contact manufacturer.

## STEREO HEADSET



A distinctive new professional-quality stereo headset is now being offered by Sargeant-Rayment Company, Oakland, California. It is designed for both private listening and professional monitoring of recording sessions. Frequency response is smooth and distortion-free throughout a wide range, from 60 to 12,000 cps. Bass response is increased by a scientifically designed molded aluminum casing, which also lends ruggedness to the units. A sealed outer surface of grey cellular vinyl chloride, on ear pieces and headrest, make the unit comfortable and, according to the manufacturer, hygienically superior to conventional hi-fi headsets. "Right" and "Left" markings are provided on the phones for the professional user. Literature and prices are available from the manufacturer at 4926 E. Twelfth Street, Oakland 1, Calif.

# Now Available: *A New Hunk of Hilarity in Script Form*

## “Dr. Lovingsone I Presume”

A soggy saga of derring-do in the wilds of the world

Four male parts, three female plus an announcer and sound effects man. Full directions for simple sound effects. A zany script for your next recording party.

7 complete scripts

**\$249**  
postpaid



“For your information friend, that is a crocodile.”

**THE TRUTH WILL OUT**  
OR  
**DAINTY-MAE TO THE RESCUE**

by  
**L. L. FANKAS**  
writer and producer  
formerly with Columbia Broadcasting System

Copyright 1954  
by L. L. Fankas  
Published by Tape Recording Magazine  
Severna Park, Maryland

## Still a Popular Favorite “THE TRUTH WILL OUT”

An old fashioned mellerdrama good for a hundred laughs. Five parts, three male, two female — and a donkey.

6 Complete Scripts

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HAVE FUN AT YOUR NEXT PARTY  
ORDER YOUR SCRIPTS NOW!

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Severna Park, Md.

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(Add 50c if you wish scripts sent by First Class Mail)

Name .....

Address .....

City ..... Zone ..... State .....

# TAPE IN EDUCATION. . . . . Robert C. Snyder

*(This month's column is a continuation of a series begun last month on teaching machines and the newly-developed techniques of programmed learning which make them possible.)*

Teaching machines and programmed learning techniques will have their greatest value in a system of education designed to develop each student to the highest level of which he is capable, and in which the teacher will be permitted and encouraged to concentrate upon the *professional aspects of teaching* rather than upon the clerical and housekeeping duties now so often imposed upon our teachers.

A number of recent books have begun to show the way toward organization of teaching to permit the development of professionalization in this long-neglected field.

*Schools of Tomorrow—Today*, by Arthur D. Morse, published 1960 in a paperback edition at \$1.50 by Doubleday & Company, Inc., Garden City, New York, is a stimulating and thought provoking book.

Subtitled, "A Report on Educational Experiments," the book is exactly that. Case by case, Mr. Morse reports on outstanding experiments in team teaching, ungraded schools, utilization of teacher's aides, television pioneering, programs for gifted students, and a most interesting approach to training future teachers under the Harvard Graduate School's Master of Arts in Teaching (M.A.T.) Program.

Under Harvard's Cooperative Plan, as it is called, outstanding liberal arts graduates are encouraged to enter the teaching profession through a program which is based

upon ". . . the Harvard contention that expertness in subject matter is essential to successful teaching."

Mr. Morse continues, "Past studies of men and women entering the teaching profession have tended to indicate that they were of lower caliber intellectually than those entering other professions. The Harvard group reverses this impression. . . . More than that, they have remained in the teaching profession."

For some years, Dr. J. Lloyd Trump (now Associate Secretary of the National Association of Secondary School Principals, a division of the National Education Association) has been recommending a series of ideas to restructure the organization of teaching and school clerical work so as to take the non-professional, non-teaching activities out of the conglomerate functions of teacher-paper grader-lunch room watcher which we now load onto the under-paid and overworked classroom teacher.

Dr. Trump would provide for Teacher Specialists, General Teachers, and Instruction Assistants aided by Clerks (to provide classroom assistance to teaching personnel) and General Aides (to monitor playgrounds, lunchrooms, etc., and assist with student activities when competent).

Principles developed as a result of studies initiated in 1956 by the Commission on the Experimental Study of the Utilization of the Staff in the Secondary School, supported by Ford Foundation funds, have been presented in a series of brochures and articles.

AN EXCITING PROFESSION: *New*

*Horizons for Secondary School Teachers; IMAGES OF THE FUTURE; A New Approach to the Secondary School; and NEW DIRECTIONS TO QUALITY EDUCATION: The Secondary School Tomorrow*, all by Dr. J. Lloyd Trump, set forth the new concepts very clearly. Some of these brochures may be out of print, but requests for copies of those that are available should be addressed to the National Association of Secondary School Principals, 1201 16th Street, N.W., Washington 6, D. C.

The book and the brochures cited above, plus the additional materials and sources referenced in them, offer a long stride toward professionalizing the field of teaching.

If all the best aspects of the proposals outlined in these sources were put into effect we would have moved a long way toward making teaching a true profession based upon subject knowledge and professional competence. We would also have removed most of the clerical and drudge content from the present duties of the teacher.

Unfortunately, however, most of these proposals are still predicated upon a "lock-step" system of *classroom education* in which the student moves in a regimented fashion from class to class and topic to topic in a relatively standardized twelve-year program *regardless of the aptitudes or instructional requirements of the individual student*.

Next month we will begin an examination of the ways in which programmed learning techniques and teaching machines will make it possible *to fit the educational system to the individual student*, rather than trying to *make the student fit the system*.



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Every Month!

If you're a casual reader of TAPE RECORDING, if you buy the magazine just occasionally for a particular feature, now is the time to change, time to make TAPE RECORDING a reading habit. Every issue contains informative and interesting articles written just for tape recording enthusiasts, in addition to regular features such as Crosstalk, Industry News, Tape Reviews, New Products, Tape in Education, Shop or Swap, etc. Each issue also contains a New Product Report on the newest of recording equipment tested for performance by our staff. Think how convenient to have all 12 issues per year delivered right to your door. **Use this handy coupon NOW!**

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# TAPE CLUB NEWS

## New Teen-Pals Director



Enthusiastic new director of Teen-Pals section of World Tape Pals is John Cummings (pictured above), an Eagle Scout of San Mateo, California. John reports a landslide of activity as he welcomes new teen-aged members of WTP (and teen-aged children of WTP members). John helps them arrange tape exchanges with other young people.

## "A German Christmas"



"A German Christmas," the tape prepared by students of Hartmut Schutze in West Berlin (pictured above), was extremely popular with World Tapes for Education participants through the Christmas season. The text features descriptions of traditional German Christmas celebrations both in English and German languages.

## New French Speaking Club

Our roster below now lists the Union Mondiales Des Voix Francaises club among the clubs. This is predominantly a French

speaking club. Americans interested in learning French or practicing the language through the club are invited to join.

Club representatives include: U.S.A.: Emile Garin (secretary), 886 Bushwick Avenue, Brooklyn 21, N.Y.; Canada: Rene Fontaine, 1657 Av. Gilford, Montreal 34, Que.; France: Guy Serin, La Salveter (Herauld); Belgium: Jose Allays, 8, chaussee de Lille, ORCQ-lez-Tournai; and other European countries: Roland Maury, 11 rue Beroit, Sirault (Hainaut), Belgium.

For information on the club, write to the secretary.

## JOIN A CLUB

### AMERICAN TAPE EXCHANGE

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

### BILINGUAL RECORDING CLUB OF CANADA

Rene Fontaine, Secretary  
1657 Gilford St.  
Montreal 34, P. Que. Canada

### CATHOLIC TAPE RECORDERS OF AMERICA, INTERNATIONAL

Jerome W. Ciarocchi, 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

Mazie Coffman, Secretary  
3612 Orchard Avenue  
Indianapolis 18, Indiana

### ORGAN MUSIC ENTHUSIASTS

Carl Williams, Secretary  
152 Clizbe Avenue  
Amsterdam, New York

### STEREO INTERNATIONAL

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

### THE VOICESPONDENCE CLUB

Charles Owen, Secretary  
Noel, Virginia

### 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

## FOREIGN

### 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, Whitsope By Duns  
Berwickshire, Scotland

### TAPE RECORDER CLUB

A. Alexander, Secretary  
123 Sutton Common Rd.  
Sutton, Surrey, England

### THE NEW ZEALAND TAPE RECORDING CLUB

Murray J. Spiers, Hon. Secretary  
39 Ponsoby Road  
Auckland, W.I., New Zealand

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

## Welcome Indiana Recording Club

Our roster also welcomes another newcomer this issue—the Indiana Recording Club.

This is a newly formed organization with headquarters in Indianapolis, Indiana. The prime objective of the organization is to promote the hobby of tape recording among its members—by use of the tape recorder, and other types of recording equipment;—to provide for its members adequate means of expression by means of the club's various activities; regular monthly meetings, newsletter, library, etc.; and to promote the exchange of tape recordings among members, and to furnish them with information concerning the use and application of recording equipment and accessories.

Membership is open to anyone interested in tape recording, and annual dues are \$3.00 per year. Membership includes the monthly newsletter, TAPE SQUEAL, and the use of the club's library facilities. Plans are now being made to affiliate with foreign recording clubs on an "associated club" basis in order to provide members with outlets for foreign tape exchanges.

Currently, a contest is being conducted among members for the best ideas of what developments may be made in the tape recording industry by 1976. Plans are also being made for future similar contests.

Additional information and application blanks may be obtained by writing to the secretary listed in the roster.

## Voicespondence Tape Contest

We on the staff of this magazine have long admired the operation and enthusiasm of the Voicespondence Club. Charles and Melva Owen do a terrific job. The Tape Contest now underway within the club is one more example of the fine handling and consideration for its members this club maintains. Again, we urge the club's members to participate in the contest. Only those in good standing with paid up dues are entitled to enter, however, and receive prizes, which is only fair.

Winners will be selected on the basis of originality of idea and in the manner it is developed. In order to give everyone an equal chance of winning, technical quality will not be of supreme importance.

Each entry will be acknowledged as soon as it is received. There are no rigid rules except against the use of copyrighted material. The Golden Mike Trophy (we pictured this in an earlier issue) will be presented to the first prize winner in each classification. The closing date for entries is April 30, 1961.

## CTRI's New Legal Advisor

Catholic Tape Recorders, International now has an official legal advisor or counselor should his services become necessary. He is attorney William J. Franks who is well known throughout the Uniontown area where he has been appointed as Assistant District Attorney for the county. He is considered one of the topnotch defense attorneys in Western Pennsylvania. The club welcomes Attorney Franks as a new member and as legal advisor.

# THE STORY OF TAPE

## Part III—How Tape Is Manufactured

by

Mark Mooney, Jr.

... an industry where perfection must be routine

**T**O make the understatement of the year, or any other year, it might be said that manufacturing tape is simply a matter of painting an even coat of iron oxide pigment on a base material and then cutting it to the desired widths.

As was mentioned in the last instalment in this series on tape, there are three common base materials in use today. One is cellulose acetate, which is available in 1 mil and 1½ mil thicknesses, another is polyester or Mylar, a DuPont product which is available in ½, 1 and 1½ mil thicknesses and a new base Tenzar, made by Minnesota Mining and Manufacturing Company. This is available in 1½ mil thickness at present.

The other ingredients in the manufacture of tape are the iron oxide, which holds the magnetism and the binder, which holds the iron oxide to the surface of the base material.

### THE OXIDE

Since it is the ferric (iron) oxide coating on the tape which holds the magnetism in patterns laid down by the recording head, it is the heart of tape and also of the recording process.

The oxide used in making tape is not a "natural" oxide in that it is not the familiar iron rust. Instead it is termed a synthetic oxide because it is produced by a chemical reaction which gives control of the particle size and other factors which affect the quality of recording possible.

The synthetic iron oxides of commerce exist in a wide variety of compositions, sizes, shapes and structures. Chemically they include hydrated ferric oxide ( $\text{Fe}_2\text{O}_3 \cdot \text{H}_2\text{O}$ ); ferroso-ferric oxide ( $\text{Fe}_3\text{O}_4$ ) and ferric oxide ( $\text{Fe}_2\text{O}_3$ ). The shapes of the particles range from spherical, cubic or rhombohedral to acicular (needle-like) and the average particle size from a few hundredth to several microns (a micron is .00004 inch).

From these many variables, the manufacturer of oxides for magnetic recording must select and control those factors to produce the magnetic properties required by the recording industry.

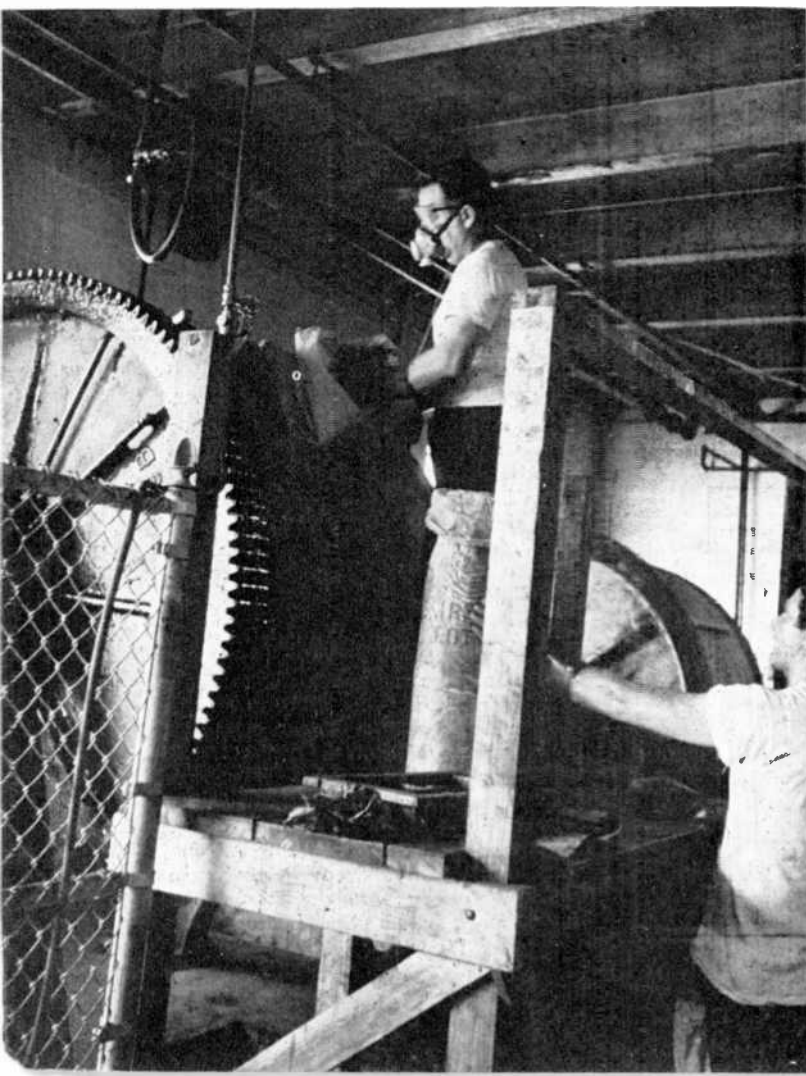
In addition to the magnetic properties, the physical properties such as oil absorption, density, particle size, pH, etc. must be controlled within narrow limits so that tape films of high integrity, with high loadings and freedom from imperfections may be achieved by the tape manufacturer.

The early German tapes used oxides which were gamma hematite ( $\text{Fe}_2\text{O}_3$ ), cubic in shape. Work in the 1930's and 1940's revealed that the acicular shaped oxides of the proper particle force had better erasing and recording characteristics. These could be produced in either the black magnetite or the reddish-brown gamma hematite types.

Today, the most widely used oxide for audio, computer, instrumentation and video tapes is the gamma ferric oxide.

A number of grades of this material with different properties are manufactured to meet specific requirements. For example, in audio tapes, the response must be uniform throughout the spectrum of 50 to 15,000 cps with no drop off in high frequency; noise and distortion levels

Loading a ball mill at the Audio Devices tape plant. These huge mills contain thousands of steel balls which reduce the oxide powder to the smallest possible size and mix it thoroughly with the binder and solvents. The number of hours the mill is run has an effect on the quality of the tape coating.



must be low and print through, or signal transfer from layer to layer must be low.

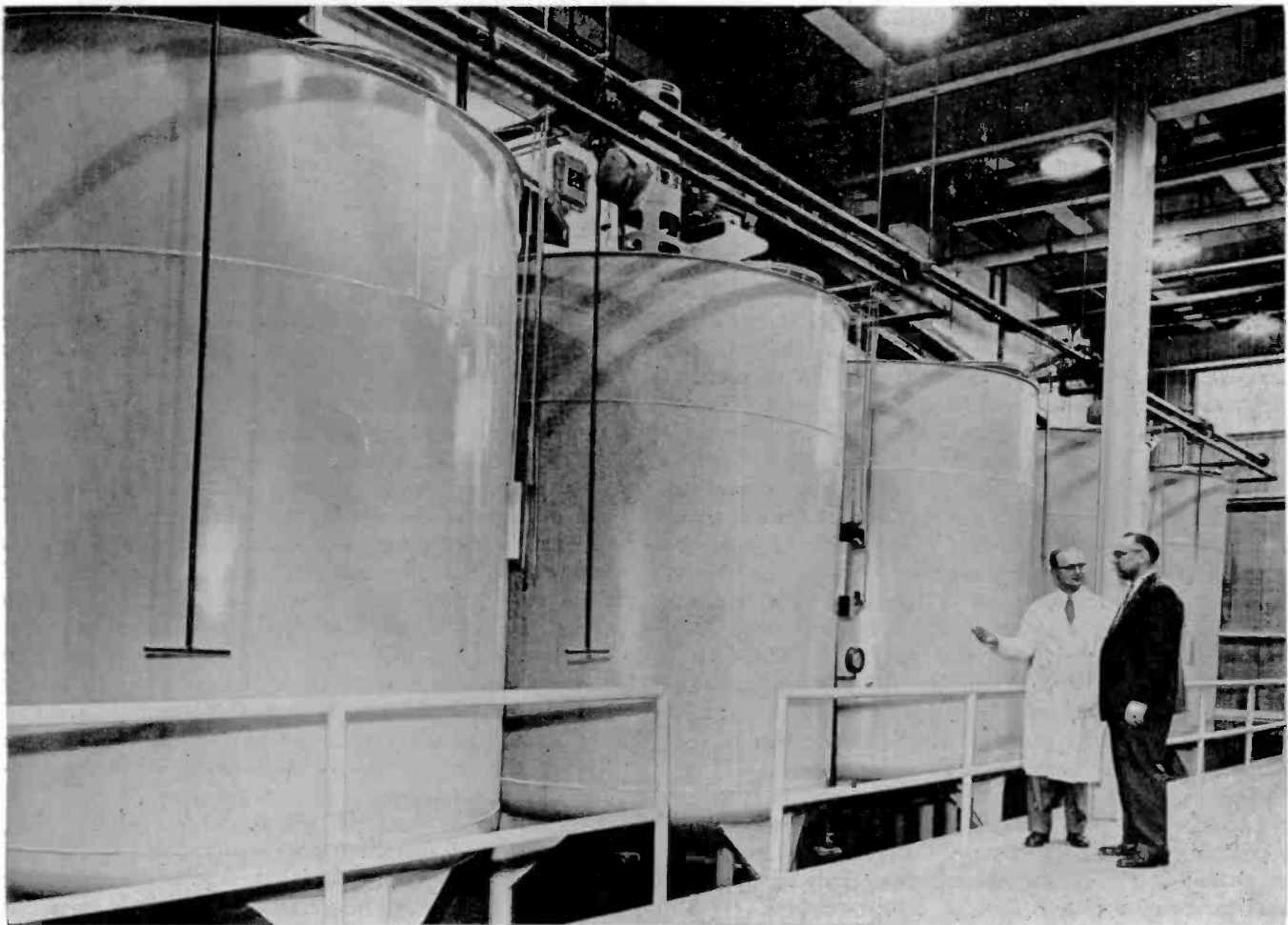
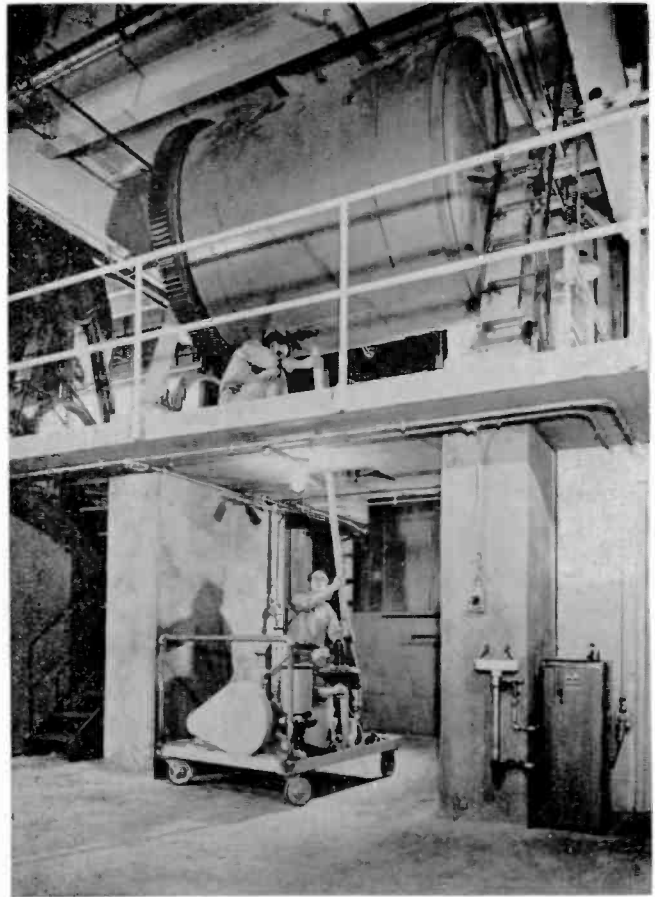
In computer tapes, frequency response and print-through are lesser factors while high output and freedom from dropouts are most important.

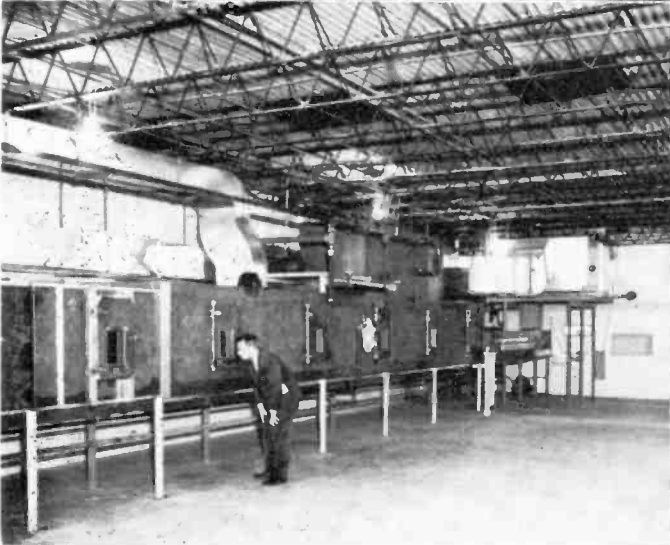
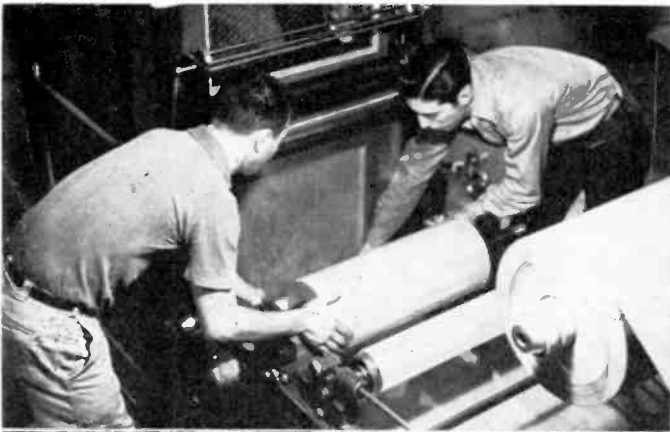
The C. K. Williams Co. of Easton, Pennsylvania is the largest maker of iron oxides, both for tape use and for such other products as magnetic ink, which is used on bank checks and records for machine bookkeeping.

The last of the steps in making the oxide ready for use on tape is its conversion from the non-magnetic form into the acicular gamma  $\text{Fe}_2\text{O}_3$ . On this last step, like so many cooks guarding their recipes, the tape manufacturers say nothing as to how they do it or how the process is controlled in their plants. These are trade secrets and are not only closely guarded but even have lead to long and costly patent lawsuits to determine who invented what when.

Basically the process consists of heating the  $\text{Fe}_2\text{O}_3$  in the presence of hydrogen or other gas until it turns into  $\text{Fe}_3\text{O}_4$  when it appears as a black powder. When this has

After the milling period is completed, the mixture is pumped to storage tanks. This portable pump is used by Minnesota Mining at its Hutchinson, Minn. plant. This area is isolated from the rest of the plant because raw materials enter it. From this point on, the oxide is not exposed to the air until after it is applied to the backing. Below: these storage tanks hold the binder and oxide mixture until it is ready for application to the tape backing material.





Upper left: loading the rolls of raw backing stock in the coating machine at Audio Devices. The raw stock is carefully protected against contamination from the time it leaves the machine which makes it to the finished tape. Upper right: a Uni-level coating machine at the Reeves Soundcraft plant. Coating thickness is of critical importance in the performance of the finished tape, both thickness and uniformity of coating being vital points. Lower left: the drying oven at the Ampex plant. Lower right: drying ovens at Minnesota Mining. After the tape leaves the coater it passes through the oven at a uniform rate of speed and under precisely controlled temperature and humidity. This step evaporates the solvents and leaves the coating adhered to the base.

cooled to a certain point, oxygen is introduced and the conversion to the final acicular form takes place. This reaction produces its own heat and must be watched carefully or the whole batch will revert to the original state and the process have to be repeated. With present industrial controls this practically never happens. Once the oxide cools to room temperature it is stable and will remain in its acicular form.

Before leaving the subject of oxide it might be well to mention particle size. When a wide range of particle sizes is permitted to occur, it is almost impossible to produce a smooth finished coating of oxide on the base. This leads to variations in recording and playback volume, random noise and varying high frequency response.

Particle size of less than one micron (.00004 inch) must be maintained. The smaller the particle size the better, and improvements in existing tapes will most probably come about more through improvements in the oxide than in base materials.

The particle size is controlled in the precipitation of the synthetic hydrated ferric oxide. As has been mentioned, the closest controls every step of the way are necessary to produce a high quality finished oxide ready for application to the tape base.

## MAKING THE DISPERSION

The next step in the process of preparing the iron oxide for coating on the base material is the making of the dispersion or "paint" which is applied to the film.

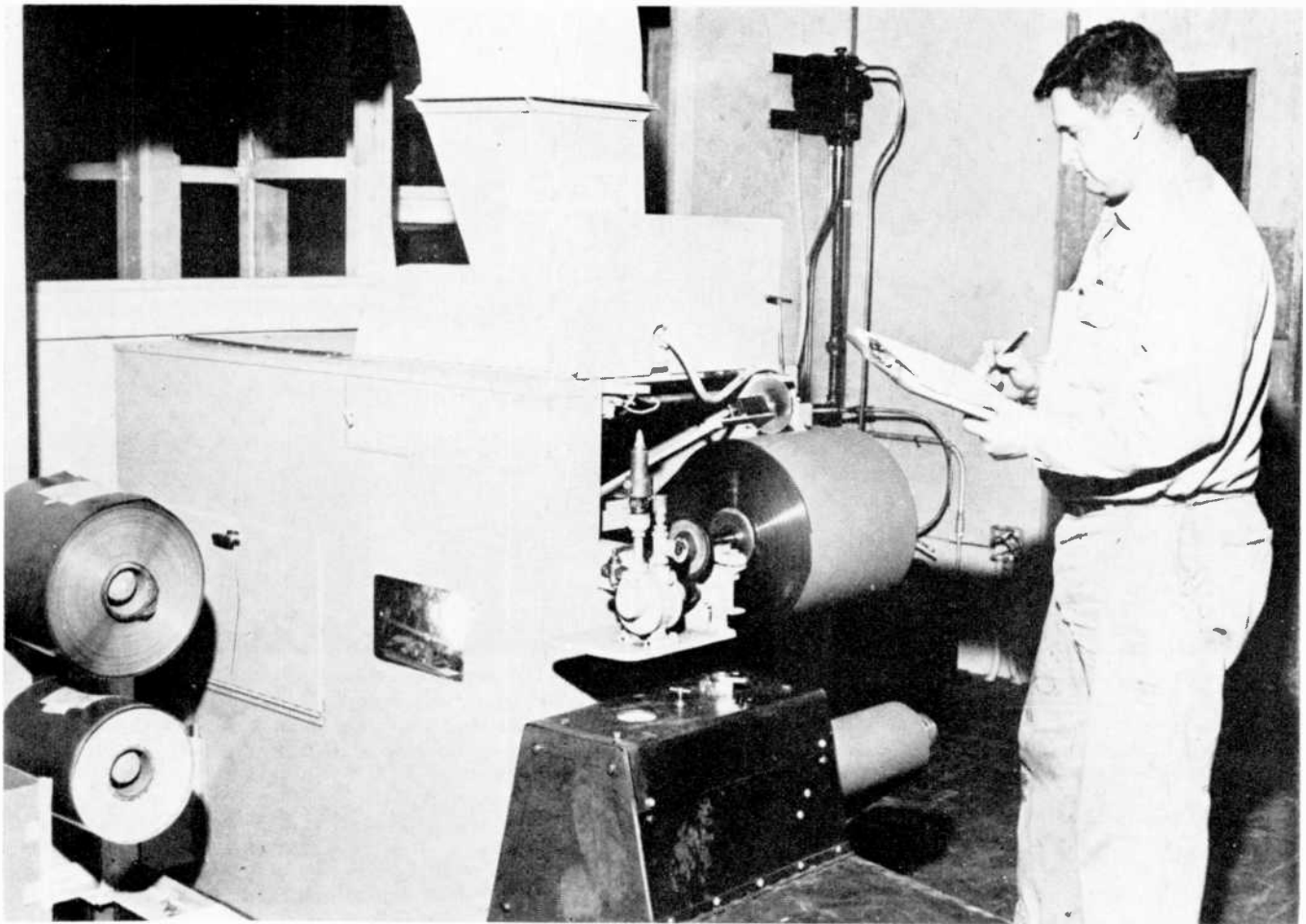
This is carried out in huge ball mills which are large iron cylinders containing hundreds of stainless steel balls about an inch in diameter. As the mill turns the whole mass inside it tumbles over and over, the balls grinding and mixing the contents of the cylinder.

Because iron oxide, with particles a micron or less in size is so fine, it is difficult to get it mixed evenly and smoothly, and combined with the ingredients that make up the binder, which holds the iron oxide to the tape.

Before the ball mill begins its work there is generally a slurry period where the oxide is loaded into a tank or into the mill together with a wetting agent and part of the binder solvents. This gives the solutions time to soak through the mixture and get between the individual particles. This soaking may last up to two days.

At this point, more of the binder materials (resins, plasticizers and more solvents) are added and the ball mill started. This milling period may be continued for as long as ten days to insure that a perfectly homogenous





Following coating and drying, the tape is buffed or polished to give it an even surface. This is Reeves Soundcraft's patented Micro-polishing machine which physically polishes the tape to a mirror-smooth finish. This step in tape making gives a tape of uniform high frequency response, evenness of coating and less head wear.

mixture without lumps is secured. After a period of about 24 hours, a sample is taken from the mill and applied to the base material. If the sample meets the specifications, then the rest of the constituents are added and the final milling takes place. The period of time that the mill is run must be watched carefully for if the milling is not enough a rough-surfaced tape will be the result; if too much there is a settling out or even an emulsification of the mixture.

The result is actually a superfine paint which from this point on must not be allowed to contact the air and must be kept at a stable temperature and in tanks with agitators until it is ready for the coating machines.

Before being applied to the tape base, the mixture is forced through filters which screen out all particles greater than one micron in size.

### COATING

Stated simply, the coating process is one in which the magnetic paint is applied in a microscopically thick coating to the backing material and is then dried in ovens.

But like so many things which can be stated simply, doing it is another matter.

At one end of the coating machine is the stock roll with either a friction or electromagnetic brake to maintain tension on the raw stock. This is fed over an idler and may be brought under a radioactive element which causes

the plastic to lose its affinity for picking up dust. This is followed by some sort of vacuum cleaning arrangement to make certain that the base material has not so much as one dust speck on it anywhere.

At this point the coating head which meters the amount of magnetic paint applied to the film lays down a layer of paint on the base.

Prior to this point, the base material may have been precoated with a layer of solvent which is partially dried off before the coating head is reached. This permits better keying of the magnetic paint to the base material.

On the accuracy of this coating process depends the uniformity of the tape. In order to keep the recording sensitivity within 1 db per roll, the coating thickness must be kept within limits of .0000125 of an inch.

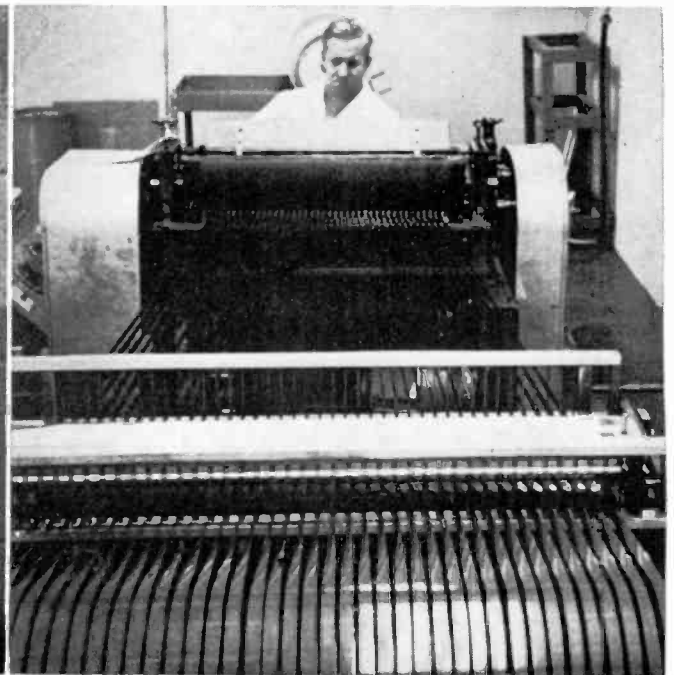
In the making of video tape, the tolerance is on the order of nine one-millionths of an inch.

The thickness of the tape coating itself is on the order of one-sixth the thickness of a human hair.

The stock rolls are up to a few feet in width and the sheet as it feeds through the machine is known as the "web."

After leaving the coating machine the web passes over a magnetic head which monitors the sensitivity of the tape. An aligning magnet, to make all the particles line up one way is also used following the coater and before the web goes into the drying oven.

In the ovens, which are maintained at a temperature



After the tape has been made it is stored in hospital-clean storage rooms to await slitting to commercial widths. Hundreds of thousands of listening hours are represented by these jumbo rolls at the Minnesota Mining plant. Right: the slitting process which cuts the jumbos to the size desired and spools the tape on the hubs or reels for delivery to the customer. Slitting is another in the many critical processes in tape making for the width must be maintained within a few thousandths of an inch, the tape edge must be smooth and even with no nicks and it must not cause the edge to waver or fray. This slitter is at the Audio Devices plant.

of from 120 to 150 degrees F, the solvents are evaporated off leaving the magnetic paint firmly adhered to the base material, whatever it may be.

The air in the drying oven, and in tape plants as a whole, is both filtered and kept at proper humidity and temperature levels. The rooms are at a positive pressure so that when a door is opened to the outside the air always blows out, never in.

Dust causes "dropouts" which cause a spot of signal loss. These are serious in computers where thousands of bits of information are crowded on every square inch of the tape. A flaw as fine as 1/10 mil can cause an error. In video tape, flaws as small as a 30-millionth of an inch

can cause a signal loss. When it is considered that one roll of video tape lasting 64 minutes has about the same area as a tennis court, the fantastic lengths to which quality control must go in the tape industry becomes apparent.

As the web comes from the drying oven it is wound on large reels called jumbos and these are stored in hospital clean rooms to await slitting and spooling.

The dry web may also be subjected to super calendaring and lubrication which imparts a nearly perfect surface to the tape. In many cases the lubricant, (one of the silicones) is mixed right in with the dispersion.

The calendaring is done by means of rolls which squeeze the tape between them. Another process uses buffing wheels and still another doubles the tape back upon itself, rubbing oxide surface against oxide surface to polish off any high spots and to give a good gloss to the finished product.

#### SLITTING AND WINDING

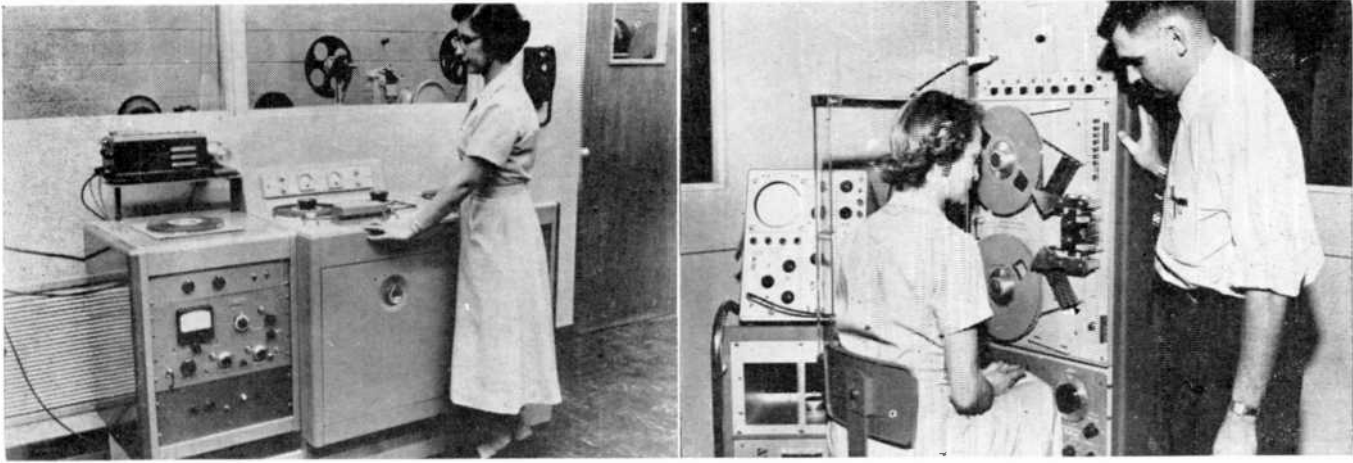
One would think that at this stage of tape production the stringent tolerances might be let down a little but such is not the case. Standards for tape, for instance the familiar 1/4 inch audio tape, specify that the tape width shall be .247 inches, plus or minus .003 inches. As you may recall from the decimal equivalents table, 1/4 inch equals .250.

Variations in tape width can cause trouble by causing the tape to hang up in guides, scrape on reel edges and otherwise cause trouble in use.

The tape is cut using rotary blades which slit the web coming from the jumbo rolls into the widths desired. Audio tape is available in the common 1/4 inch width, 1/2 inch width for four track mastering and other widths as may be needed for special or experimental purposes.



Grinding the slitter blades at the Ampex plant. A jeweler's loupe is used to examine the circular blade edges to make sure they are perfect. A dull or imperfect blade will leave its mark on every foot of tape it cuts.



Continuous testing of every batch of tape that goes through is the mark of the responsible tape manufacturer. Sample cuts from every web are tested to make sure that the tape meets the physical and magnetic specifications claimed. The testing equipment is far more critical than the equipment on which the tape will ultimately be used. Shown above are the testing rigs at the Reeves Soundcraft plant, audio test on left, instrumentation on right.

Computer tapes are generally  $\frac{1}{2}$  inch or wider and video tape is 2 inches in width.

To maintain the accuracy of the slitting process the cutters must be reground frequently because the iron oxide, even though it is the very finest of particles, is still an abrasive and wears the cutter edges more than if they were used on some other materials.

In addition, the cutters must be maintained at peak performance levels so that they will not produce a rough edge, or nick the edge of the tape, which would then be weakened at that point and might later tear in use.

The slit web is fed onto the spools or hubs at a constant tension to insure even winding.

Any tapes which come off the slitter unevenly wound or which do not track properly are rewound. Some firms use professional tape decks for rewinding so that the finished reel is of the correct tension and has an attractive appearance.

Too loose winding is unimportant so long as all the tape can be put on the reel, except that it detracts from the appearance of the product. But too tight winding may impart a stress to the tape and subsequent changes in temperature or humidity during shipment or storage may lead to deforming the tape.

Following the spooling, the tape is placed on a conveyor belt and run over a large electromagnet or bulk eraser which cleans it completely of any stray signals it may have picked up from the aligning magnet or possible magnetized slitters or rollers with which it came in contact. The degaussing may be done in or out of the final box in which the tape is supplied to the consumer.

After packaging—and packaging should protect the finished reel from further contamination until it is in the consumer's hands, the tape is boxed for shipment and stored in the warehouse to await shipment.

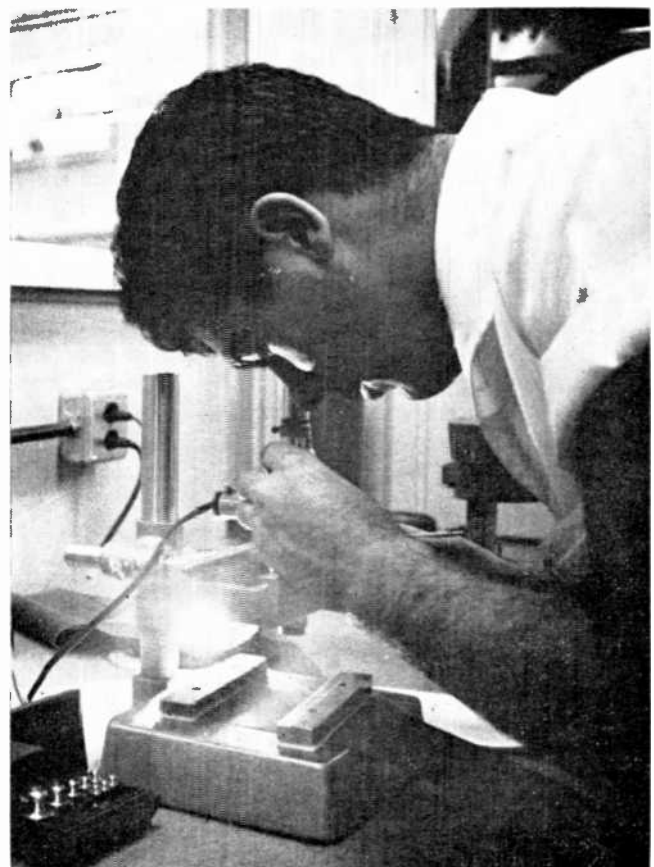
## TESTING

All along the way constant testing is necessary to assure

Checking the surface of the tape with a microscope shows up any coating imperfections. Here a lab man at Audio Devices examines a sample cut from a web to see that it is physically perfect.

that the final product is as perfect as humans and machinery can make it. From the iron oxide, the solvents, the plasticizers, the base material to the coating, drying and slitting, samples are taken and subjected to close analysis or scrutiny.

From reels picked at random, from each batch, the tape is tested for width and the thickness of both the finished tape and the coating. The tape is inspected for cupping or curl and for a bias cut which would cause it to skew on tape heads. The edges are inspected for smoothness and freedom from cuts or nicks of any kind. The coated surface is examined under a microscope to see that it





The end of the line in tape manufacture is the degaussing and packaging. Bulk erasers under the belt provide tape completely signal free. Care is also taken to provide packages which will insure that the tape reaches the customer in the same perfect condition in which it left the plant. Upper left is the Minnesota Mining packaging department, upper right, Reeves Soundcraft and lower, Audio Devices.

conforms to the specifications. The coating is tested to make sure it is firmly adhered to the base material and will not flake off and it is also checked for layer-to-layer adhesion, excess friction, or squealing.

The tape is subjected to further tests to make sure that it has the tensile strength and the resistance to tear that are called for and that its reaction to extremes of temperature and humidity are within the allowable limits.

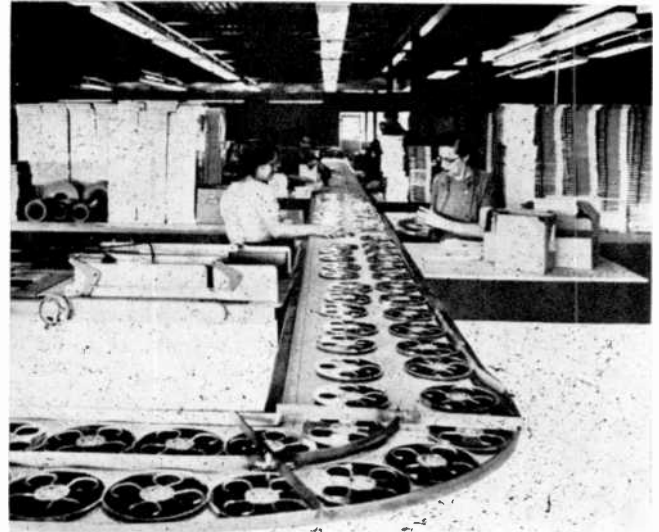
In addition to these physical tests, the tape is also checked to make sure it is up to the mark in the matter of magnetic characteristics. Its output must be uniform, it must have the proper sensitivity, it must erase properly, its frequency response must be adequate, it must be free of noise and exhibit the right amount of coersivity and remnance and also exhibit satisfactory resistance to print through.

Many of these tests require special equipment and the final checkout is usually done on the types of equipment on which the tape will be used. All of the tests are far more rigorous than would be encountered in actual practice so that good tape has a built-in safety factor so that it will be sure to meet the ultimate customer's requirements.

Making magnetic tape is no child's play but a complex industrial process not without its dangers and disappointments. Just a few years ago, a plant of one of the smaller tape manufacturers was struck by fire which, feeding on the solvents used in tape manufacture, leveled the plant. The ruins stood only three feet high by the time the fire was out.

In the coating and drying, the precautions are as rigid as the germ proofing of any hospital. Raw ingredients, such as the iron oxide, are kept away from the other parts of the plants, in some cases the ball mills and solvent tanks are housed in buildings separate from the tape making machinery. Every precaution is taken to keep dust down and out since a speck of it on the wrong place could cause a flaw in the tape, which in turn, might cause a vital figure on a computer tape to be missing.

Great care also has to be taken of the raw film stock on which the magnetic oxide is coated. This is particularly true as regards nicking the edges of the rolls. A nicked



edge might cause the sheet to tear as it is passing through the coater, or worse, through the oven. When this happens the wet magnetic paint gets on everything the broken web contacts and operations are brought to a halt until a thorough and complete cleanup is made. If allowed to remain, the paint might dry on rollers or machinery and later flake off and cause imperfections in the web of tape then passing through.

Even with the nearly perfect product put out by the manufacturers of tape, the pressure is on them to constantly improve it.

Better tapes mean higher quality at lower speeds for home recorder owners, with consequent savings in costs. Computer makers are now crowding the heels of the tape manufacturers asking for tape with higher resolution, capable of accepting and storing more information in a smaller amount of space. For a number of years, the tapes had the edge in quality and the machines on which it was used could not begin to approach the capabilities of the tape itself. But this situation no longer is true. Tape makers are going to have to improve oxides and oxide makers will probably have to come up with even smaller size particles of iron oxide than the incredibly small particles they now produce, for computer applications.

Or someone may even come up with an entirely different type of tape coating that will do the trick. Today's tapes are fine products and may be bought with confidence.

*Next month—How to buy tape. Tests you can make yourself. What about second grade tape?*



# SIX SIMPLE SOUND EFFECTS



So the script calls for the hero to bop the villain on the jaw—to save wear and tear on the actors sock your fist into the palm of your hand.



Old Dobbin? Just knock together a pair of cocoanut shell halves or a pair of plumbers helpers near the mike and you've got the hoss you need.



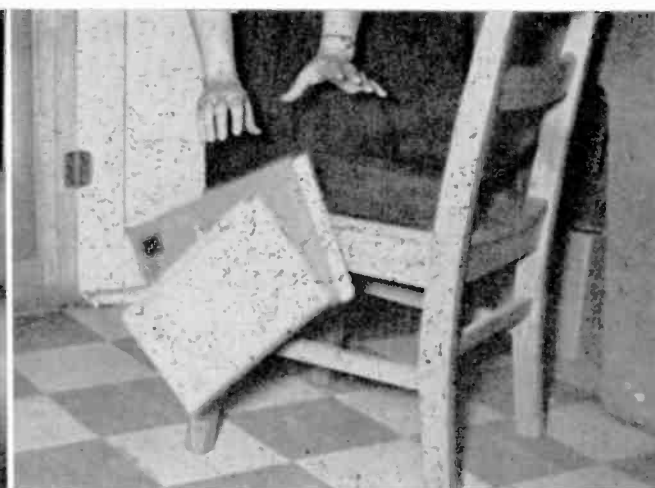
Anything from bacon frying in a pan to a raging fire can be simulated by crumpling the cellophane from a pack of cigarettes near the microphone.



Rain or surf—easy. Just roll dried peas around in the lid of a large trash can or other metal pan. Steadily for rain, in cadence for waves.



House falling down? Trestle collapsing? Pier being demolished because the captain missed the turn? Crumple a strawberry box near the mike.



A body falling to the floor after being shot, stabbed or other form of mayhem—simply shove a couple of heavy books off a chair onto the floor—plop.

# Second Channel Via Radio

by Tommy Thomas

*. . . transistorized Stereo Bug broadcasts second channel to nearby radio.*

LAST month you were introduced to the Knight-Kit *Wireless Broadcaster*, a fascinating component that can transform your recorder into a miniature, personal "radio" station, capable of transmitting your recordings to any AM radio in your home. Now, here's another version of this same type of wireless broadcasting station. Although not as versatile as the Knight unit (which may also be used as a regular amplifier, for instance), this new broadcaster has a few intriguing features of its own you should know about.

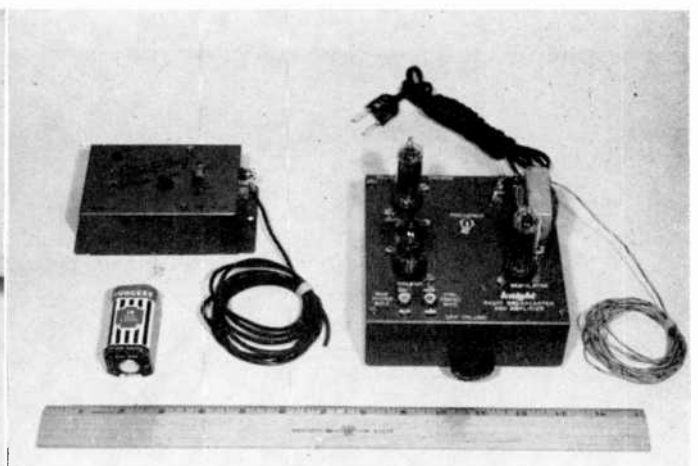
The "Stereo Bug," as this transistorized, battery operated unit is called, comes completely assembled, ready to use, from the Lafayette Radio Electronics Corporation (165-08 Liberty Ave., Jamaica 33, New York). It's their No. PK-226, costing \$13.23 plus postage on 1 lb. The 6-volt Burgess Z-4 battery is extra, No. BA-109, 70¢.

The Stereo Bug is an ingenious device that enables you to play the second channel of your stereo system through your broadcast radio receiver. It can be used with any ceramic stereo cartridge or tape head and playback preamp. (And of course the Stereo Bug works quite splendidly with a regular monaural recorder, for mono wireless broadcasting. As explained last month, just use the recorder output marked "To Auxiliary Amplifier" or—lacking such an outlet—look up in your instruction booklet just how to get this sort of output.) The AM receiver can be tuned to a clear spot anywhere between 550 and 1000 KC. The light-weight unit is completely transistorized and contains a highly efficient oscillator, insuring stable and safe operation . . . and it's

easy to install, with no soldering required. Actually, this last statement about no soldering required is based upon the assumption that you *already* have the proper cable(s) for leading from the recorder preamp (or equivalent, as noted above) to the Stereo Bug, and that it won't be necessary to reduce excessive preamp output via a 1-megohm resistor or potentiometer.

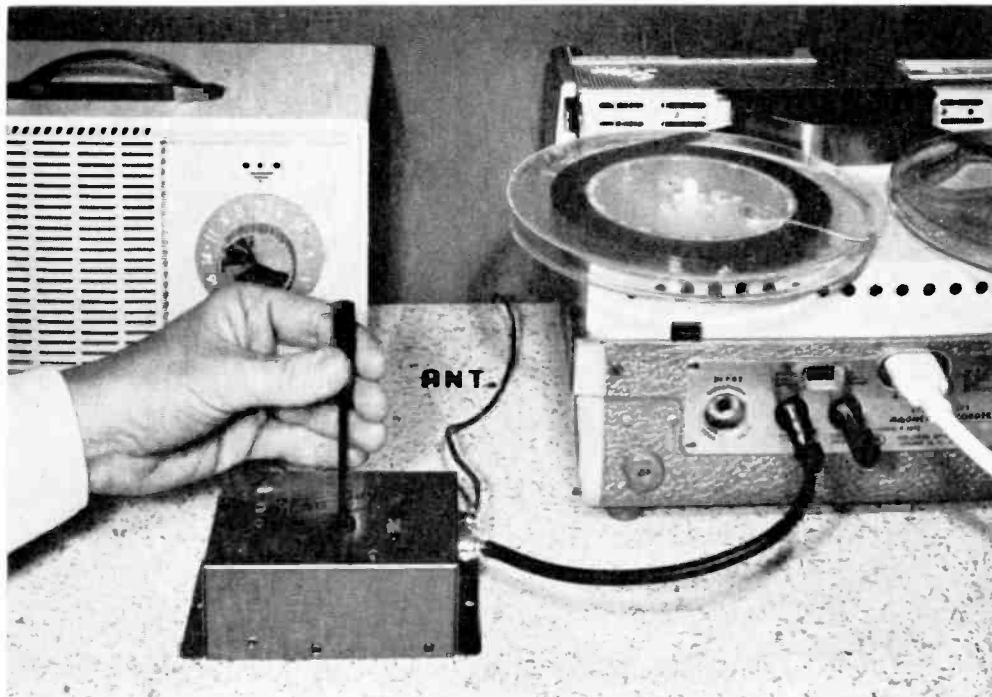
The Stereo Bug, it should be noted, is not offered in exactly the same vein as last month's broadcaster. As just quoted, it enables you *to play the second channel of your stereo system through your AM receiver*. Used in this manner, it's quite a clever deal. Most of the new 4-track stereo recorders record monaurally and play back both monaurally and in stereo. This means that you have to have a second auxiliary amplifier and loudspeaker hooked up to your recorder whenever you want to utilize the stereo playback feature. So now, with the Stereo Bug "system," you set up your recorder, plug the little broadcaster into the second channel preamp output, tune in a radio set six or eight feet over to the left, and you're "in business."

The best part of all, as I see it, is that it inexpensively solves the *immediate* problem of playing stereo recordings on your new machine. You could use your TV set for the second channel, most likely, but this is often inconvenient, not to say completely impractical usually when you want to avail yourself of the recorder's portability and take it "visiting." Of course, using a radio set with its limited frequency response is not really the highest of "fi," by any



Left: the "Stereo Bug" is an ingenious, completely transistorized wireless broadcaster for special uses. Although not quite as versatile as last month's Knight-Kit broadcaster, it has a few special features of its own that are well worth investigating. Right: here, for direct comparison, are the two broadcasters. The 6-volt battery fits inside the Stereo Bug unit, of course, and the attached Radiation Wire shown can be almost any small gauge six foot (as recommended) length of insulated wire. Though there's a battery, the Stereo Bug has no tubes that will ever need replacing.

Locate a relatively quiet place on the radio dial between 550 and 1000 KC. Then, with a small screwdriver, turn the internal set-screw slowly until the tape you are playing comes in clearly. This is easiest to do if you first insert a "blank" phone plug into the external speaker socket, cutting off the sound from the recorder.



means, yet it's surprisingly good nonetheless. Eventually, most likely, you'll want to get a really excellent amplifier/speaker system so as to truly get the most out of your recorder and the excellent stereo tapes on the market today. But good *matched* speakers (and stereo auxiliary amplifiers) cost much money, so you can use the Stereo Bug radio system to bring you very enjoyable stereo listening **RIGHT NOW!**

Also, of course, you can use it—along the lines described last month for the versatile Knight-Kit Wireless Broadcaster—to broadcast your recordings around the house for all the family to "tune in" on. Naturally, used this way you won't be able to transmit your recordings *in stereo* to a single radio set, but you **CAN** combine the right and left

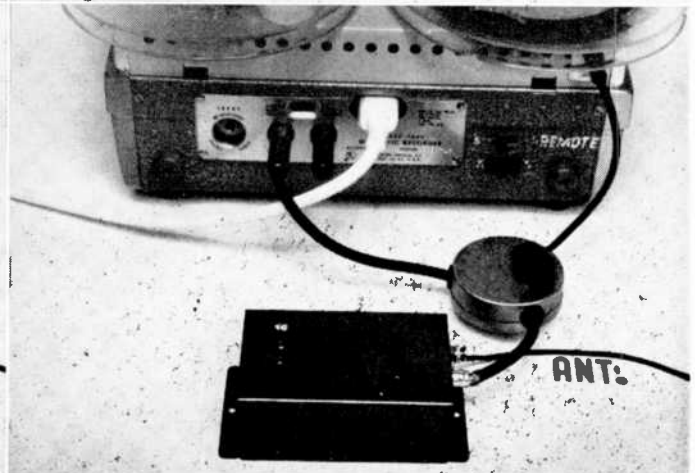
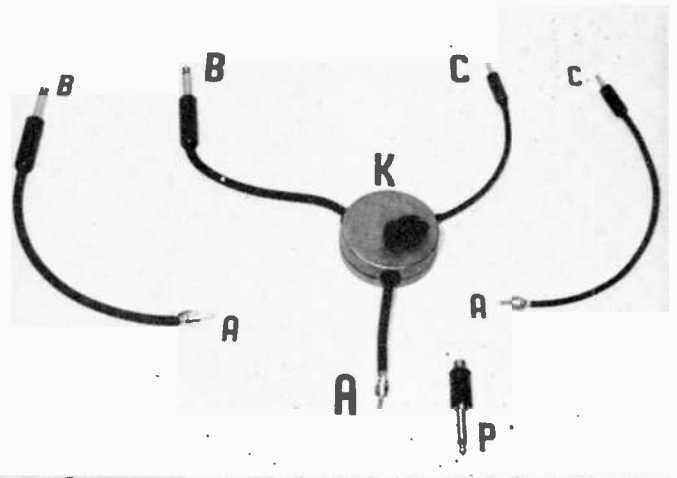
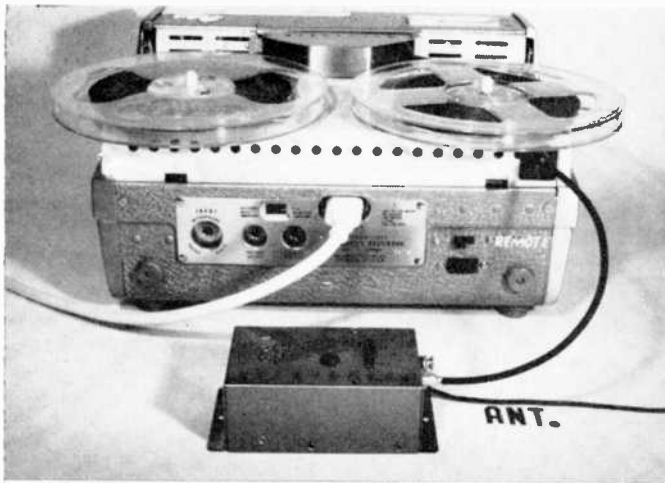
sound tracks into a complete, balanced monaural version for this purpose. The accompanying photos show you how the different wirings are set up for a Wollensak stereo recorder, complete with an easy-to-build "octopus" that serves a number of functions.

By now, most likely, you're wondering which broadcaster to get: the Knight-Kit unit which you have to assemble yourself, or the ready-to-go Stereo Bug (which costs a few dollars more). So let me make a few comparisons for you, to better help you decide.

Physically, the Stereo Bug is the more convenient of the two, being smaller and lighter . . . about 7 oz. against 28 oz. for the Knight unit. Unfortunately though, despite its small size, you had better not get the idea that you can

For a semi-permanent installation, the Stereo Bug can be fastened right to the side of the recorder. For monaural transmitting, this side is closer to the 1st channel outlet. If you wish mainly to use the 2nd channel output for stereo listening, then very likely it would be better if you located the unit on the other side.





Upper left: the simplest system is just to set the Stereo Bug behind the recorder and plug it in. Then stretch out the radiation wire, turn the unit on and you're "on the air." The short cable shown here is the A-to-C cable more clearly illustrated in the following photo. Upper right: the simple shielded cables A-B and A-C may be all you will need. But if it is necessary to reduce an excessive preamp output, or if you want to combine the two separate channels for a single balanced monaural output, then the easy-to-make special K-ABC "octopus" control is worth having . . . inside a typewriter ribbon can. Lower left: this is the hookup for stereo (broadcasting to a nearby AM radio for the second channel), similar to the hookup in above except with a potentiometer added. The signal coming from the 2nd channel preamp is without a recorder volume control, so adding a "pot" gives you the proper stereo balance control so often needed. Lower right: this is the hookup for converting stereo to monaural, necessary when you want to broadcast a taped stereo "program" around the house for other members of the family to pick up monaurally on their AM radios. The potentiometer control knob is adjusted so that both channels combine and come "through" equally.

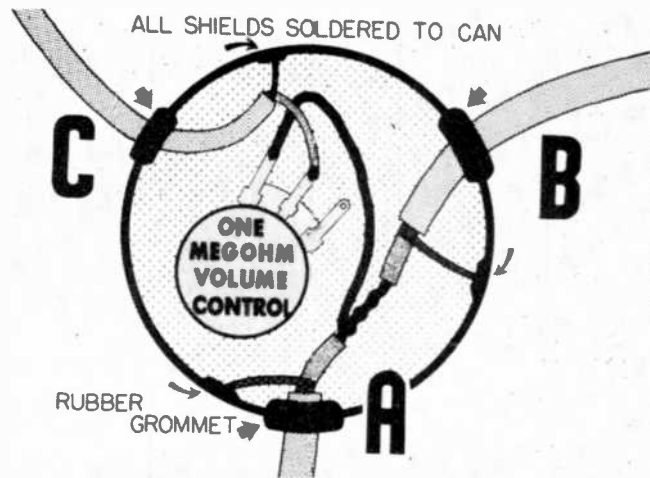
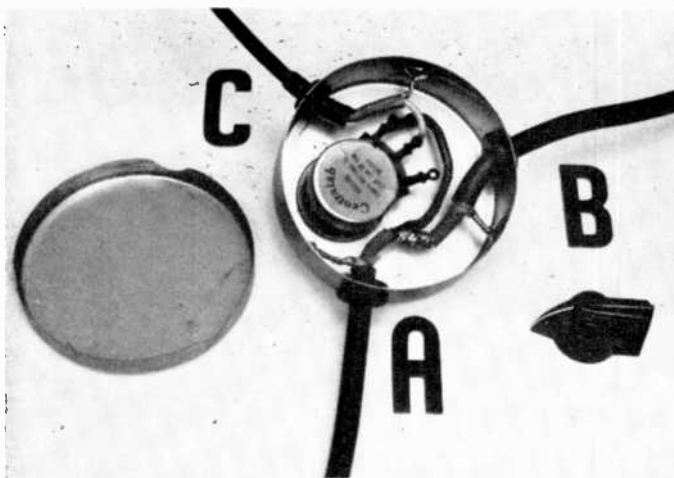
"hide" it inside your recorder for convenience. In fact, don't try to locate the Stereo Bug anywhere at all where excessive heat might build up (*around* it, as no heat will come from inside the unit itself) or your transistor—which is highly sensitive to heat—may go dead on you. Also of great importance, you should know that the battery-operated (a 70¢ battery lasts its shelf life, or about 600 hours) Stereo Bug puts out a definitely *cleaner*, more humless signal than does the 110-volt A.C. powered Knight transmitter. This is especially important, I think, when the unit is being used to supply the "matching" channel sound for stereo listening. So all in all, within its limitations and mainly because of its cleaner sound, the Stereo Bug is the better unit if you don't especially need the extra versatility of the Knight transmitter/amplifier.

BUT! And it's a big "BUT!" Please keep in mind the extra versatility of the Knight unit when making your decision. Both transmitters will broadcast your *tape recorded signal* from 50 to 100 feet or more, but only the Knight transmitter will work adequately *with a microphone* (see last month's Crystal Ball routine). When I plugged a crystal

mike into the Stereo Bug unit and transmitted, the maximum distance I could get from the antenna was five feet away, and even at that close distance it sounded pretty miserable. Also in favor of the Knight unit is the fact that it can be used as a low-cost audio amplifier by simply attaching to any PM speaker. This, of course, is entirely outside the realm of the Stereo Bug. Finally, I suppose I should mention that next month's article—on building a simple yet exact-working *Tape Editing Machine*—makes good use of the Knight broadcaster in its role of amplifier.

So you see, unless you're willing to buy *both* units (and since they're really not very expensive, this isn't such a bad idea), choosing one or the other of these two wireless broadcasters might be a bit of a problem? ? ?

The instructions that come with the Stereo Bug tell you to lead your stereo tape's 2nd channel from your tape recorder preamp (which is needed to operate the unit) directly to the transmitter. But, the Stereo Bug is designed to operate with audio inputs not to exceed 0.4 volts RMS, so if more than this is coming out of your preamp (causing distorted sound) then you will have to reduce the extra



Left: here, with (what is now) the back lid off, is the inside of the metal typewriter ribbon can holding the 1-megohm "pot," along with the necessary interwiring. By surrounding this wiring with metal, and soldering all the cable shields to the sides of the can, the all-important shielding is continued without interruption. Right: note that the inner "hot" wires of cables "A" and "B" are joined directly—twisted together and then soldered. In effect, it's the same as having the single cable A-B. Then, by way of the 1-meg volume control, the inner wire from cable "C" joins in. Be very sure that none of the "hot" wires touch the metal can.

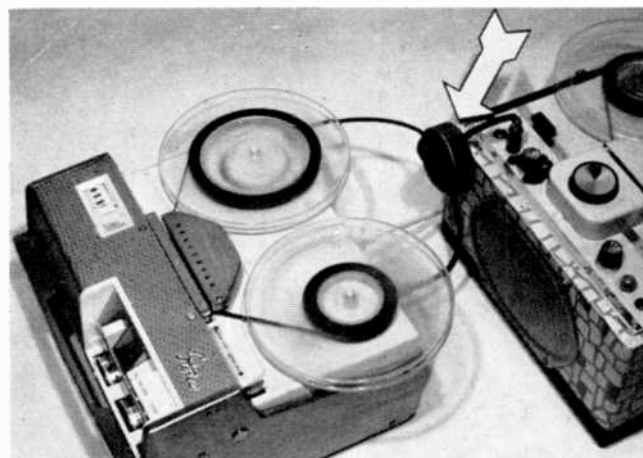
volume by placing a 1-megohm resistor or potentiometer in series with the hot lead of the cable leading from recorder to transmitter. And of the two, I soon discovered that using a volume control (Centralab 1-Megohm Replacement Control, Type B-70), was a better deal, as it gives you *variable* control of the output instead of just a "drop." This is important when you wish to combine *and balance* both stereo channels into one, either for mono broadcasting to AM radios or if you should ever wish to combine both channels of a stereo recording so you can re-record it monaurally.

Depending upon what type of recorder you use, it will be necessary to experiment a little to determine what will give you the best results, and whether or not you will need (or want) the extra control provided by a potentiometer. At the very least you will need one or two short shielded cables for connecting the recorder to the Stereo Bug (one at a time, of course, and depending upon whether you want to broadcast the 1st or 2nd channel). These are represented by cables A-B and A-C in the photo on page 28. You'll need RCA-type phono plugs on the ends of the cables that plug into the Stereo Bug. These are at the "A" ends of the cables. The plugs at the "B" cable ends are Switchcraft  $\frac{1}{4}$ "-diameter Type 255, 2-Conductor "Little-Plugs." The smaller plugs at the "C" cable ends—which are a special size for the 2nd channel output from the Wollensak recorder shown—are Switchcraft sub-miniature Type 755, 2-Conductor "Tini-Plugs." The special adaptor-plug "P" shown (and shown in use at right) provides a convenient means of converting the RCA-type phono plug so that it will plug into a regular  $\frac{1}{4}$ "-diameter input phone jack (Switchcraft Type 345A Shielded Phono Jack/Phone Plug Adaptor. I used two sizes of shielded mike cable here, mainly because I had them handy, but the smaller size should do fine all around. It's Belden microphone cable, Type 8411.

Now for my little "octopus" cable-connector device that makes it easy to hook up your recorder and the Stereo Bug in various different ways, always under accurate volume control. Besides the parts already listed, you'll need a *metal* (for shielding) typewriter ribbon can (or something similar), three rubber grommets, and a knob for the volume

control. The construction of this little unit is very simple, as illustrated in the photos, and eliminates the need for single cables A-B and A-C unless you want them "extra" for special use (such as in the photo, showing a semi-permanent hookup of the Stereo Bug to the recorder).

I highly recommend your making this little control unit yourself, not only to save money but for the experience it will give you in working with special cable connections for your recorder. Following the same idea, and with or without the volume control (maybe with *switches* instead), it should be easy for you in the future to design and make up your own special "octopii" whenever it becomes necessary for you to join a number of shielded cables together. Of course, if you're bound and determined NOT to do your own wiring, then you can spend the extra money and replace the can and wiring with a Flexible "Y" Connector, Switchcraft Type 330F1, and a special plug-in 1-megohm Volume Control Adaptor, Switchcraft Type 366. You'll still need the A-B and A-C type shorter cables, so better see your local dealer and tell him what type recorder you have.



Most home stereo recorders can't record stereo at all, but just play it. So, if a friend of yours has a stereo tape that you would like to copy for your own listening pleasure, you'll have to do your copying in mono. By using the "octopus" control unit you can balance and combine the two channels into one quite easily.





## *Recording with Tranceivers*

*... Citizen's band portables  
offer opportunity for remote  
recordings*

**E**VER since the FCC decided that part of the radio spectrum might be used by John Q. Citizen without the necessity of passing an exam, there has been an increasing number of citizen's band radios on the market.

These fall into two categories, if the power put out by the transmitter is more than 100 milliwatts, then a permit is necessary to operate. If the power is less than this, then no permit is necessary, provided the transmitter is used with the antenna specified.

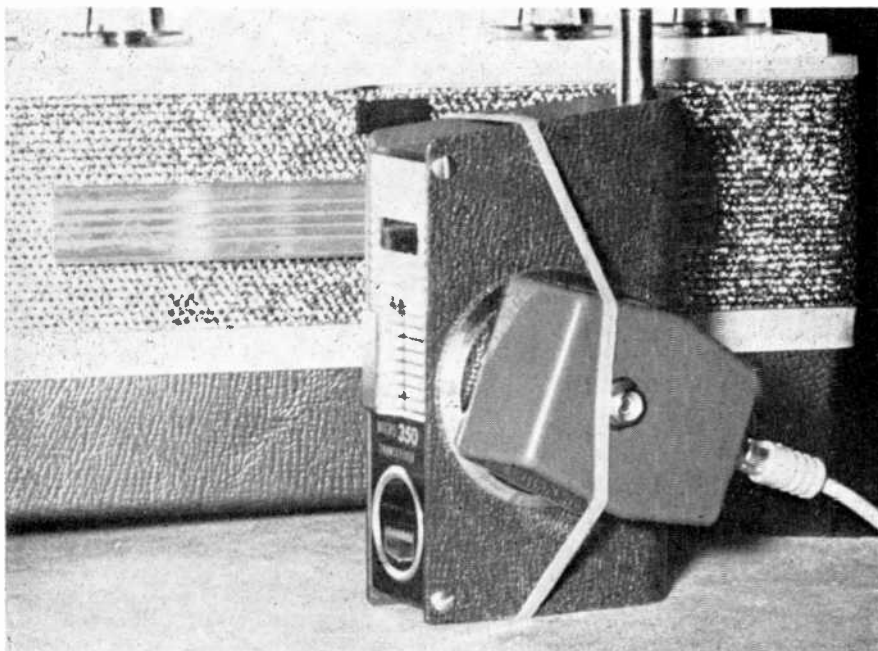
In the latter category, the units have more and more been approaching the Dick Tracy wristwatch radio although none that small have been marketed.

Latest on the Transceiver front are the American-made Webcor Model 350's which are just about a handful, slip

easily in a coat pocket and have a range of up to five miles over water. Elsewhere, the range will vary, depending upon the surroundings. In the city amongst the steel buildings, the limit might be a half-mile or less, out in the boondocks, away from obstructions a mile is obtainable.

What no one has mentioned, so far, is that these transceivers offer the tape recordist a traveling microphone that is independent of mike lines. The recorder can be hooked up where convenient and with one unit feeding the recorder microphone, the other can be taken out for sidewalk interviews, used to take inventory or what have you, with the recorder faithfully picking up every transmission.

It was the idea of inventory taking that intrigued us. At the very least, this is a painful chore but with the recorder



A rubber band slipped around the transceiver holds the mike in place to pick up the sound being broadcast by the other unit. The transceivers are very sensitive both on transmission and reception; only drawback is that you might be sharing air with others in your locality on same channel. If so, you can move to quieter channel by having crystals changed.

Taking inventory becomes much less of a chore with a portable transceiver. All that needs to be done is to dictate the number and prices of the items and they will be recorded for later transcription. The recorder (opposite page) is back in the store office with its microphone held by a rubber band to the transceiver. Slow tape speed is adequate. Recorder is a Webcor Royalite II.



set up in the office, the inventory taker was free to roam the shelves and by simply speaking into the transceiver mike, to have his counts and prices recorded on the tape. This was later transcribed into the inventory sheets and the job was done easily and more quickly than by old fashioned methods.

We rather imagine that in a large yard, say a lumber yard, this method would be a real saver of time.

The small transceivers are peaked for voice and are not intended for the transmission of music with high quality but interviews are done very satisfactorily.

One thing must be remembered, when using one of these units you are sharing the air with others who might be operating on the same channel. They will pick up your broadcast and you will pick up theirs. This can sometimes louse up a recording if there is too much interference. Ignition noise and noise from such things as diathermy machines in hospitals, etc. can also add to the confusion.

If the channel to which your unit is tuned is too noisy in your locality, it is possible to take the unit back to the dealer and get new crystals put in it which will put you on a different channel where the interference is less.

Of course, these units have all the uses of any transceivers, and there are many many uses for them. The Webcor transceivers go for \$189.95 per pair with single units selling for \$99.50.

As shown in the photo, all you need to do is hold your recorder mike against the transceiver with a rubber band and you're in business. We tried this with the Royalite II Webcor shown in the photo and it worked fine. Since the transceiver is quite sensitive, it will pick up the voice from about 8 to 10 feet away so for those who like to be sneaky and play the hidden mike trick, you can go modern and hide the transceiver.

Just remember that whatever you say goes out over the public airways!—and you also share the air.



Left: units are small enough to go in pocket and are light in weight. Above: the speaker side of the "works." Speaker also serves as mike. Right: compact construction on printed-circuit board. Battery is nine volt, antenna extends to 44 inches.

# NEW PRODUCT REPORT

STA **OK** STED



## KNIGHT UNIVERSAL PREAMPLIFIER

*... versatile unit permits mixing, sound-on-sound, echo effects, stereo and mono record and playback.*

**T**HE Knight Universal Stereo Tape Preamp is aptly named for the number of its functions and combinations of functions is such that it is truly universal.

Designed primarily to match the Knight KN-4000 tape transport, it none-the-less can be used in conjunction with any two or three head tape transport for the adjustments in the unit will permit the proper alignment, voltages, etc. to match the heads.

The kit is set up for three head operation but an optional switch is available which, when wired in, plus circuit

changes, will make the unit suitable for two heads.

However, it is only with the three head setup that the full capabilities of the Universal Preamp are realized.

The unit will permit mixing of mike and other input, such as a phono, on either of both channels. Each channel may be individually adjusted for making stereo recordings then the master gain may be adjusted without upsetting the stereo balance already established.

With the three head setup, instant comparison of the input with what is actually going on the tape is possible.

*Product: Knight Universal Pre-amplifier*

*Manufacturer: Allied Radio Corp., 100 N. Western Ave., Chicago 80, Ill.*

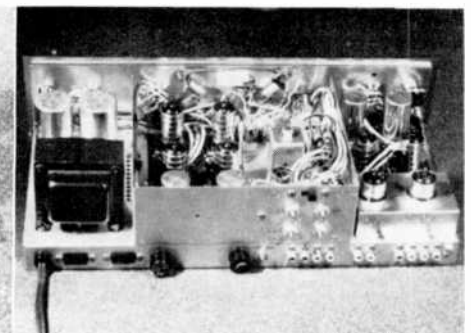
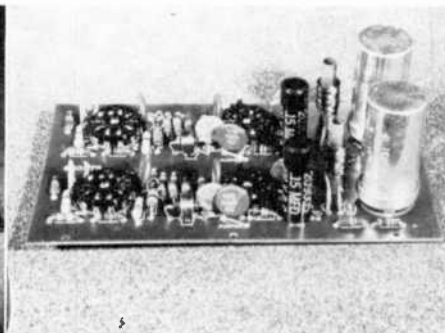
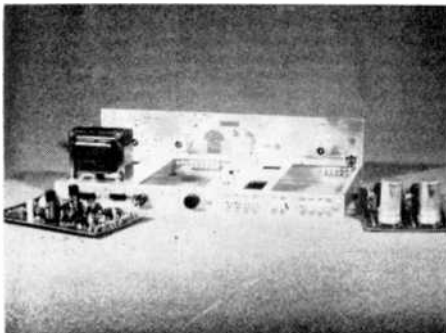
*Price: Kit \$79.95; Factory wired \$129.95*

The twin VU meters operate on both record and playback to indicate record and playback levels. The function switch permits the selection of record or playback on either channel monophonically or both together for stereo. Equalization changes for  $3\frac{3}{4}$  or  $7\frac{1}{2}$  ips is taken care of by the equalization switch. This operates for both record and playback.

The erase and playback voltages are preset to match the heads of the Knight tape transport but can be adjusted to match the heads of other good quality transports. The bias oscillator is fixed at 100 kc, which is more than adequate for any erase head.

The controls on the face of the unit are as follows: on the left are the two jacks for monitoring either or both channels. The output will drive a pair of crystal headphones or an amplifier. Next is the dual playback level control, the small center knob controlling the right channel, the large knob the left. Underneath this is the monitor switch which permits switching between source and tape for monitoring.

The next knob is the selector switch which is followed by the twin VU meters. Above these is the record indi-



Left: the preamplifier with all parts in place and ready for wiring. Center: two printed-circuits are furnished which saves a lot of critical wiring and makes unit compact. Right: the completed wiring job ready for the case. Shielding is excellent, reducing hum to the vanishing point for best performance.



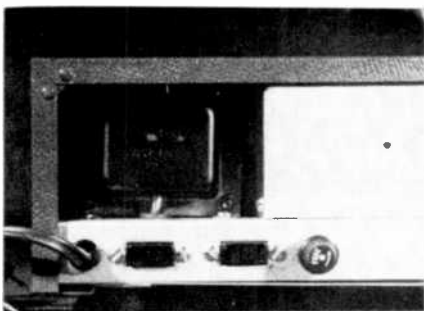
Center portion of control panel showing twin VU meters which function on both record and playback. Knob at left of meters is selector switch, one on right controls right and left volume to auxiliary jack. Left switch below meters controls mode of recording (multi-normal-echo) and switch to right is for equalization.

cator light. On the lower part of the face plate, to the left and right of the VU meters are the multi-normal-echo switch, which governs the selection of recording mode, (sound-on-sound, normal or echo) and the equalization switch for  $3\frac{3}{4}$  and  $7\frac{1}{2}$  ips.

The next knob is a dual one with friction clutch which matches the playback volume control previously mentioned. This governs the volume of program material being fed to the right and left "Aux." jacks on the back.

Next is another dual knob which controls the record level of the right and left microphone jacks which are at the right of the case, matching the two monitor jacks on the left side. The entire unit, incidentally, is of very attractive appearance.

On the rear of the chassis, at the left, are two 110 volt outlets for powering auxiliary amplifiers, etc. and a fuse. On the radiation shield are the capacitors for bias adjustment, etc. These have been preset at the factory



Left side of chassis has two 110 volt outputs for powering other equipment and fuse. Right side has all audio inputs and outputs plus adjusting screws. The multiplicity of inputs and outputs makes this unit one of the most versatile on the market today. Construction time was on the order of about 40 hours.

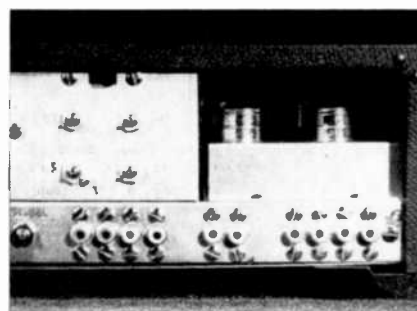
and should be handled carefully so as not to disturb the setting.

On the lower part of the chassis are the jacks for the inputs and outputs other than the jacks on the face of the unit. These include, erase head, record head, playback head, playback outputs, auxiliary input for high level sources (radio or TV, crystal phono, etc.).

The unit contains 9 tubes and is completely shielded. The frequency range is 18 to 22,000 cps plus or minus 2 db on playback, 25 to 19,000 on record. The panel is in beige and gold. The over-all dimensions are  $4\frac{1}{8}$ " high,  $15\frac{1}{2}$ " wide and 9" deep.

We obtained the preamp in kit form and found that the manual was well written with excellent instructions. The steps were well planned and the diagrams clear and concise. It was the opinion of the consumer who put the kit together that it could be understood and assembled by the novice.

The parts were easily identifiable, the resistors were mounted on printed



cards and the wires were pre-cut to length.

A big help in the assembly and wiring were the two printed circuit boards which shortened wiring time considerably.

The service adjustments to make the preamp work with a deck other than the Knight were easily made by following the instruction manual.

If the preamp is used with tape transports having only two heads, changes in the wiring are necessary but these are indicated in the instruction manual in the proper places in the wiring sequence.

Once constructed and connected to a three head tape deck, the unit lived up to the specifications claimed for it. Results were highly satisfactory on all counts and equal in every respect to units costing considerably more.

The only difficulty encountered was with a faulty 12HT7 tube which had been damaged and which would not perform when placed in its socket. When replaced with a new one the unit worked on the very first try.

During construction all parts fitted well and the only difficulty encountered was with the monitor switch on the front panel. This has a very close clearance with the chassis and grounded. A piece of insulating material slipped under the terminals rectified this.

The input sensitivity is .5 mv at the microphone inputs and 80 mv at the auxiliary inputs for maximum record level. The 100 kc bias oscillator is, as has been mentioned, sufficient for any erase head and the voltage is adjustable to match any head.

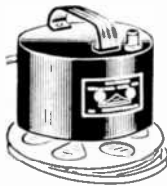
The unit was singularly free from hum and noise. The specs call for a level of 52 db below the recording level. Equalization at the  $7\frac{1}{2}$  ips speed is standard NARTB with separate equalization at the  $3\frac{3}{4}$  ips.

The kit, as are all Knight kits is covered by a guarantee to perform as specified or the money paid is refunded.

The versatility of this unit when connected to a three head machine gives the recordist about every function that can be put on a recorder. Many tape transports, originally equipped with two heads, can have another added to permit monitoring and such an addition is very worthwhile since it permits hearing your recording from the tape as you are making it.

We have no hesitation in recommending this Universal Preamp, either in kit or wired form.

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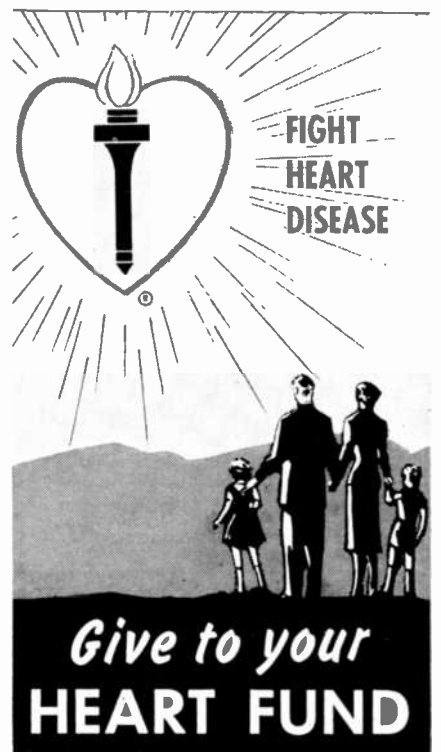
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