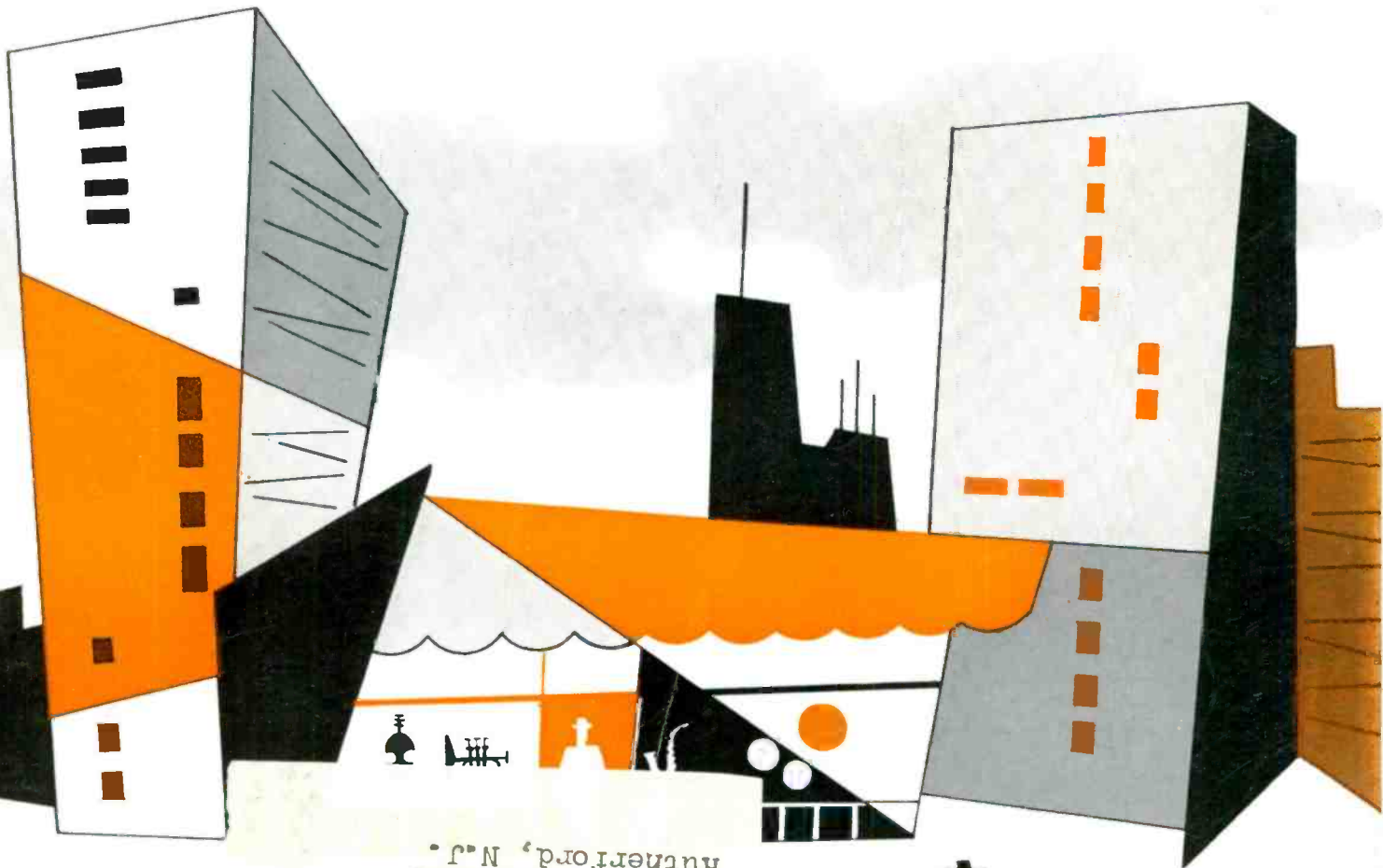


TAPE RECORDING

4 Track Buying Guide and Directory Issue



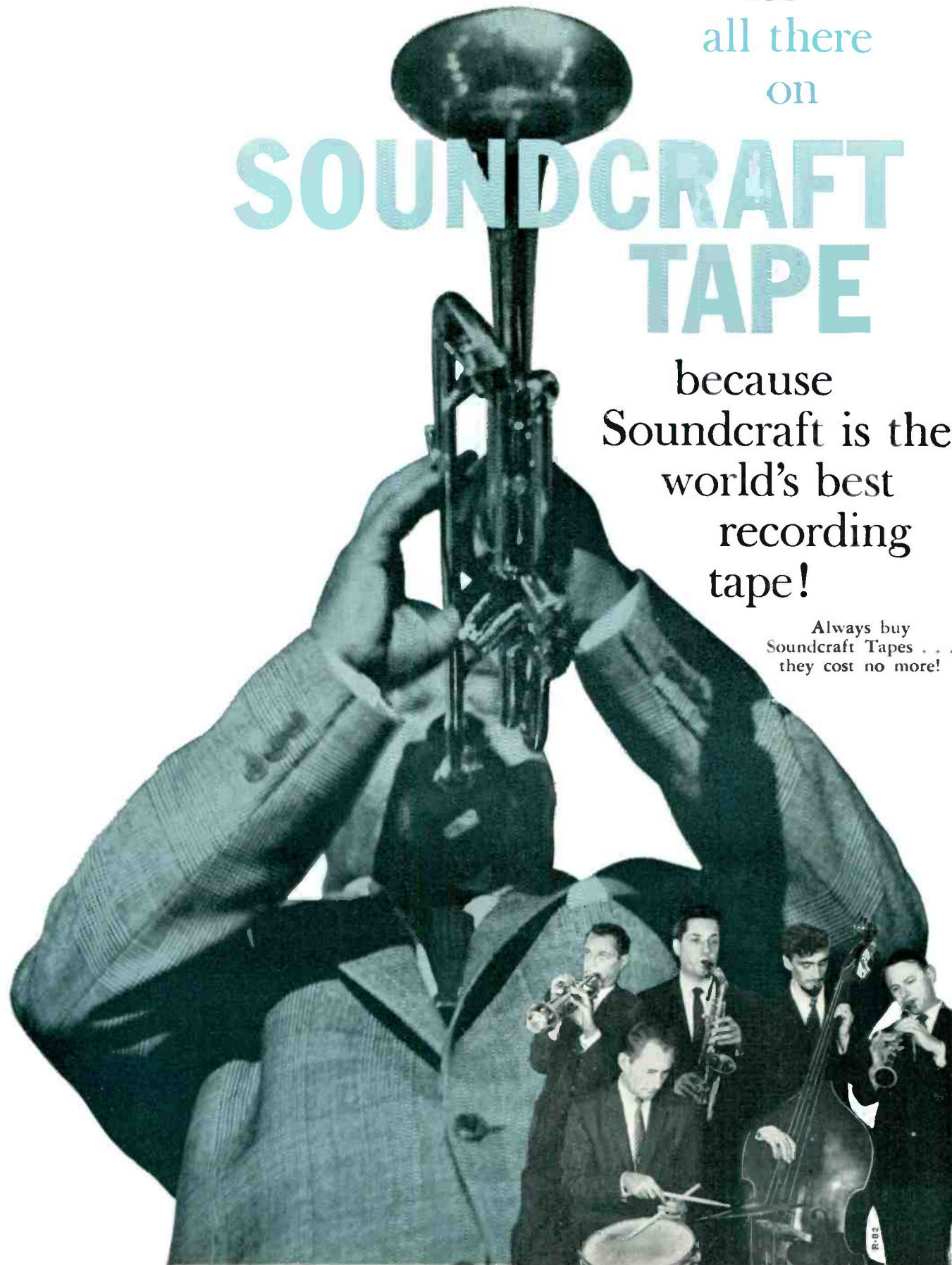
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TAPE RECORDING

VOL. 6 NO. 12

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DEX 960

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NEW TAPES

SEMI-CLASSICAL RHAPSODY IN BLUE

AN AMERICAN IN PARIS

Heindorf directing Warner Bros. Orchestra. Bert Sheffer, piano soloist—Dan Lube, violin soloist.

WARNER BROTHERS BST 1243

4-track, 7½ ips

\$7.95...30 mins.

Let us quote again from George Gershwin, "My people are American; my time is today—music must repeat the thought and aspirations of the times." With this theory, Gershwin composed and his compositions are brilliant. Warner Bros. has combined two of his most popular works on this release and they demand your listening attention.

The Warner Bros. Orchestra under Heindorf's baton most adequately do Gershwin deserved justice—they give a sparkling performance. Interpretation, orchestral tone, and carefully controlled pickup of individual sections and soloists is right on the button.

Warner Bros. recording engineers labored over this one and the finished product is a tribute to their labors. Clear, beautiful fidelity.

SHOW

GIGI (From sound track of motion picture)

Overture, Thank Heaven For Little Girls, It's A Bore, The Parisians, Waltz At Maxim's, The Night They Invented Champagne, I Remember It Well, Say A Prayer For Me Tonight, I'm Glad I'm Not Young Anymore, Gigi, Finale

Leslie Caron, Maurice Chevalier, Louis Jourdan, and others of original cast.

MGM ST 3641

\$7.95...32 mins.

Anyone who has seen the motion picture will want this tape in their show collection. Hearing the film sound track vividly helps recall scenes from the picture.

We have heard some of the more popular songs from Gigi played and sung by others which we thought were superior

to the performers' renditions from the picture. None, however, have the lively feeling exhibited by those singing them while enacting the story of the little girl who blossomed into a beautiful woman.

An engineering masterpiece—fidelity is superb.

PORGY AND BESS

A Woman Is a Sometime Thing, Summer-time, Oh, I Got Plenty of Nothin', I Wants to Stay Here, Bess, You Is My Woman, It Ain't Necessarily So, Street Calls, My Man's Gone Now, Bess, Oh Where's My Bess?, There's a Boat That's Leavin' Soon for New York

Lena Horne and Harry Belafonte

RCA EPS-236

2-track stereo, 7½ ips, reel-to-reel

\$11.95...38 mins.

Lena Horne and Harry Belafonte each is an artist in his/her own right. Combined they are a smooth duo.

While their voices are entirely different, their style is similar. Both sing with a perceptible emotional impact. They resemble actors performing before a live audience, especially with songs like Gershwin's music from Porgy and Bess which unfolds a story in itself.

Lena really belts out "It Ain't Necessarily So," and as Mr. Belafonte has already been associated with folk music, he glistens on "Street Calls."

All in all, however, we weren't too enthused with the backing nor arranging afforded the singers on this release. Even the best of performers need proper surroundings.

RCA's fidelity engineering is tops, as usual.

POPULAR

SING ALONG IN STEREO

Side 1: Sentimental Journey, Show Me The Way To Go Home, Oh, You Can't Get To Heaven, Ain't She Sweet, Five Foot Two, Marie, Down By The Old Mill Stream, I'm My Own Grandpaw.

Side 2: In The Evening By The Moonlight, Side By Side, On the Farm, I Want A Girl, Bicycle Built For Two, Red River Valley, On Top of Old Smokey, Caissons Go Rolling Along.

Marty Gold's Guys & Gals

KAPP KT 41001

4-track, 7½ ips

\$7.95...32 mins.

Is there anyone who hasn't at some time gotten together with a group of friends, relatives or neighbors and had a rousing cheerful singing fest. Perhaps it was at last night's party, maybe a family reunion, a hayride, bus trip, picnic—whatever the occasion it was fun and you'll do it again in all probability.

Chances are the selections most sung are the affectionately chosen old-timers, such as those on this tape. And it's also almost certain many of you will be familiar with new verses, new lyrics, and rhythmic lyric backbeats that have somehow grown just as well known as the originals. This delightful tape release has it all, with a charming group of singers whose harmony, diction, and blending are sumptuous.

Why not plan a friendly gathering soon—the holidays are just ahead—and include this tape in your preparations—we think it's a dilly.

A salute to you Kapp, your recording engineering, including mike placement, couldn't be improved. Let's have more like this one.

ORGAN WITH A BEAT

Tuxedo Junction, Moonlight Love, My Shawl, Fascination, Twilight Time, You Can't Be True, Dear, Perdido, September Song, Tenderly, Around the World, Sunrise Serenade, Laura.

Don Johnson Organ Combo Deluxe

KANDY KS-715

2-track, 7½ ips

30 mins.

We have often remarked about the charm and versatility of organ music and this tape is every bit as charming and versatile as many we have reviewed. Don Johnson has a technique all his own which is fascinating. To this he adds vibes, piano and accordion, together with a full rhythm section of guitar, bass and drums. Total effect is—how you say—"magnifique."

This tasteful array of selections is grand for dancing. Again there is variety—the younger set and those young in heart will like the beat of Tuxedo Junction and Perdido, while the more sedate folks will appreciate renditions such as September Song and Tenderly, although every number seems to be well arranged and has its own appeal. There is a slight tugging on your



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Here are five of the nation's best selling albums of music, now available for the first time on 4-track stereo tape. Included are Roger Williams, 77 Sunset Strip, Sound Track of Gigi, Andre Previn-David Rose, and Porgy and Bess with Ella Fitzgerald and Louis Armstrong.



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listening apparatus which pulls you toward rewinding and playing the reel a second or even third time in succession.

While fidelity is good, we did not feel there was complete overall balance in recording of the instruments, as though mike placement was not thought out enough. At times we had to turn up the volume to fully hear and appreciate that which was being played and we liked the artists and selections so well, we did not wish to miss any part of the release. Actually, this one criticism may be somewhat unwarranted, but on a tape such as this, perfection of recording is desirable, since the music itself is desirable.

LIKE SOMEONE IN LOVE

Side 1: There's A Lull In My Life, More Than You Know, What Will I Tell My Heart, I Never Had A Chance, Close Your Eyes, We'll Be Together Again, Then I'll Be Tired Of You, Like Someone In Love

Side 2: I Thought About You, Midnight Sun, You're Blase, Night Wind, What's New, Hurry Home, How Long Has This Been Going On

Ella Fitzgerald; Frank DeVol and His Orchestra

VERVE VST 4-201

4-track, 7 1/2 ips

\$7.95 ... 56 mins.

This tape is made up of songs about people in love and Ella sings as if she is in this blissful state herself.

While this entertainer has a lyrical talent and her voice travels over a wide range of notes, you nevertheless find it becomes somewhat wearisome after a few selections. At least we found it so although we appreciate the fact that Miss Fitzgerald's fans would disagree with us wholeheartedly.

Perhaps this impression has resulted from the fact that every number has a slow paced beat. We must admit too that some of the selections we are entirely unfamiliar with.

Can't complain about Mr. DeVol's backing, but we would have liked a bit more schmaltz in the arrangements.

No fallacies caught in reproduction.

CONTINENTAL VISA FOR THOSE WHO'VE BEEN ABROAD

Side 1: The Poor People of Paris, La Vie En Rose, Delicado, Beyond The Sea, The Petite Waltz, The Third Man Theme, Autumn Leaves, Anna, Fascination, Comme Ci, Comme Ca, Symphony, April In Portugal

Raoul Meynard and Orchestra

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WARNER BROS. BST 1215

4-track, 7½ ips
\$7.95 . . . 32 mins.

A musical passport to Europe—for those who have had the opportunity of being there, you'll have memories—for those who have not been so fortunate, you'll have dreams.

The selections chosen for this tape were chosen meticulously and a wise choice they were. There is a mixture of music originated in various countries, which has filtered its way to widespread continental popularity, and which eventually landed on the American hit parade.

There is an extremely lovely stereophonic effect on The Third Man Theme. The individual arrangement of each number is enchanting. Raoul Meynard and His Orchestra are as refreshing as the music they play.

Settle down and listen to this tape, listen good and your mind's eye will view a cafe in Paris, a quaint Viennese coffee house, Rome, Berlin, an entirely different way of life than you are used to and maybe just a bit tired of.

The stereo effect, the pickup of solo mandolins, zithers, varied instruments is excellent. Crystal clear, flowing musical fidelity. Yep—we liked it.

LET'S SWING

Side 1: Gotham Jump, Little Angel's Lullaby, In a Persian Market, Sultan's Serenade

Side 2: Lullaby of Birdland, Moonlight in

Hindustan, Nitwit Serenade, Perdido
CONCERTAPES 4T-3007

4-track stereo, 7½ ips, reel-to-reel
\$6.95 . . . 30 mins.

Perfect for dancing. The distinctive musical styling of Mr. Tracy is brought forth now that he has his own band. Formerly, he arranged music for some of the nation's leading jazz orchestras.

The band plays quite well and we would like to hear more of it. We think it belongs more in the public eye. All too many orchestras today tend to copy a bit of someone else's style—not so with this group.

Fidelity is clear as cellophane.

LOVE IS A GENTLE THING

Sequence A: Green Grow the Lilacs, Times Are Gettin' Hard, Turn Around, Go 'Way from My Window, Delia's Gone, Walkin' on the Green Grass

Sequence B: Fifteen, I Never Will Marry, I'm Goin' Away, Small One, Bella Rosa, All My Trials

Harry Belafonte
RCA KPS-3038

4-track stereo, 3¼ ips, cartridge
\$8.95 . . . 40 mins.

To enjoy this tape you should be in a melancholy mood, but not one of lagging spirits, because the tender, tear-jerker melodies, softly presented by Mr. Belafonte, are apt to stir a sadness within you. The seriousness with which this personality sings was never more evident.

Whether in films, TV, the legitimate theatre, night clubs or concerts, the distinctive characteristic of putting feeling into each song is ever-present when Belafonte performs. His whispering quality voice has a quieting effect.

There is a lovely mellowing background which RCA's engineers have woven into the recording with just the right finesse to accompany the singer. Quality engineering usually means top-grade reproduction and this tape is no exception to this rule.

WESTERN

BALLADS OF THE BUSHLAND

Rover No More, The Shearers' Jamboree, The Ned Kelly Song, Stockman's Last Bed, Across The Western Plains, Ooleera, Click Go The Shears, The Dying Stockman, Dream Time For Jedda, The Murray Moon, Cooee Call

The Le Garde Twins
BEL CANTO STB/52

2-track, 7½ ips
23 mins.

The Le Garde twins are national favorites of Australia. They grew up in the land down under and lived the rugged life of the remote settler, always dreaming of the day when they could step into the entertainment field.

Finally, the boys saved enough to buy a guitar and they were on their way. At first their talents were bestowed upon friends and neighbors, but eventually they headed for the United States.

The collection of numbers on this release are authentic ballads of the Australian bush country. Actually, they are very much like our own Western folk music.

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While the twins have a pleasant harmony, our enthusiasm for them is rather mild. We got the impression that they needed more practice, since on many occasions there was deviation between their timing—they just were not keeping together in the manner of polished singers. An entertainer's entertainer might say they were not giving it their all.

We were impressed, however, by the unusual sounds pouring forth in the Coee Call.

Our praises for Bel Canto's recording facilities and staff have been way up there ever since their first tape release and their engineers' professional touch was evident as usual. Fidelity very good.

DEMONSTRATION

SMS DEMO (ONE THROUGH NINE)

Leon Bibb Sings Folk Songs—Irene; Songs from Flower Drum Song—Overture; Dancing in High Society with Ben Ludlow and His Orchestra—People Will Say We're in Love; Twelve Songs From Great Films—Oklahoma; Harmonica Spectacular in Stereo—The One I Love Belongs To Somebody Else; Hawaiian Hits—Drums Of The Pali; Cha Cha Cha with Eduardo Fernandez—Blue Skies Cha Cha; Twilight Time by the Monarchs of Melody—By The River Sainte Marie; and Dancing Under the Stars with Ashley Adams and His Society Orchestra—How High The Moon

STEREOPHONIC MUSIC SOCIETY S10
4-track stereo, 7½ ips, reel-to-reel
\$3.95... 28 mins.

Get this one, fellow tape collectors. Just having a library of demonstration tapes is a treasure of taped music, and this particular tape adds much to the treasury. At the price offered, this release is a "Jim-Dandy" indeed.

There is a non-tiring variety of selections and artists here—excerpts from nine of SMS's delightful repertory, some of which we have already reviewed.

Quality engineering—high fidelity.

MISCELLANEOUS

MIDNIGHT IN ROME

Side 1: La piu bela del mondo, Guaglione, Voce e' Notte, Lazzarella, Vogliamoci tanto bene

Side 2: Tu che mi parato a'ffa, Luna sanremese, Appassionatamente, Piccolissima serenata, Samba

Walter Baracchi, piano, with Gianni Monese and His Orchestra

STEREOPHONIC MUSIC SOCIETY S13

4-track, 7½ ips
\$7.95... 36 mins.

Rome at night becomes a land of enchantment. Bathed in moonlight and starlight, ancient ruins become clouded in mystery as intriguing shadows are cast thither and yon; fireworks pierce the velvety blackness on the Feast of St. John; and walking along the Tiber at night, structures that appear distasteful in daylight take on a picturesque hue.

Midnight in Rome is a time of beauty, a time for meditation, a time to forget the seething restlessness of worldly ways and remember instead only those things worth remembering.

Such are the thoughts and visions this tape is meant to convey. It is not for danc-

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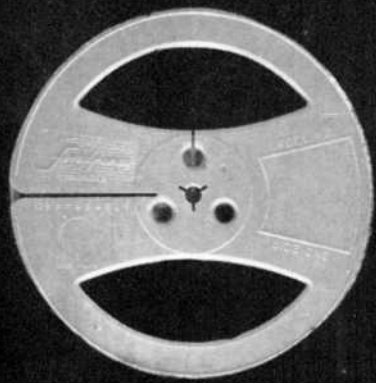
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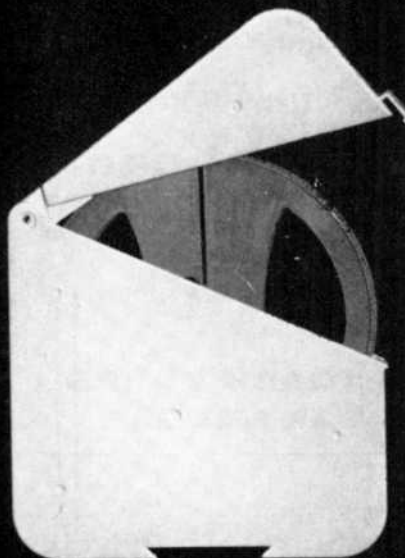


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FERRODYNAMICS CORPORATION, LODI, N. J.

ing (the Samba is included to bring to mind the night clubs also in evidence in Rome at night), nor is it for light, hardly noticed, background music, but for pure listening pleasure. And unless treated as such it cannot be fully appreciated.

This type music is particularly stimulating in stereo and the stereo separation on this tape is topnotch. Excellent fidelity.

ORIENTA

Song of India, Beggars' Procession, Yokohama Ferryboat, Rain in Rangoon, Madam Sloe Gin's, The Girl Friend of a Whirling Dervish, Mountain High, Valley Low, Scheherazade, Limehouse Blues, Night of the Tiger, Nagasaki, Train to Ranchipur, Runaway Rickshaw

The Markko Polo Adventurers
RCA EPS-243

2-track, 7 1/2 ips, reel-to-reel
\$11.95... 36 mins.

One of the lines on the label of this release is "Impressions in Music and Sound." We're glad this was there, otherwise we would have been forced to follow our first impression as the tape unwound. That was simply that somebody's "off his rocker."

We've heard a great many unusual tapes and considered there couldn't be too many

more "strange" recordings we hadn't come across. But, we were wrong again.

Here sounds and effects have been coupled with interesting melodies and varied rhythms to come up with a tape that's different, quite different, from the customary run of releases.

Through the use of a wide assortment of woodwind and rhythm instruments, coupled with authentic sound effects and much imagination, arranger-conductor Gerald Fried has come up with this recording.

The stereophonic effect is most apparent here. For instance, on "Madam Sloe Gin's" we hear someone walking toward music which to us sounds as though it's coming from a speakeasy. You hear them go into the place where a crowd is jabbering and the music becomes loud. When the tune being played ends, you hear them leave and walk away into the night.

If you know what the selection is and just what Mr. Fried is trying to convey, you have a better understanding of what you are hearing. This type tape is suited more for stereophonic demonstrations or showing off your home stereo equipment than anything else. We might suggest you ask your dealer for a sampling of this one before purchasing.

In any event, fidelity is just about as good as you could possibly want it to be.

NEW TAPES RECEIVED

REEL-TO-REEL

Bel Canto, Wailin' With Winnie, Winnie Gould, 2-track, STB/53

Bel Canto, Strictly for Dancing, Max Pillar and His Dance Band, 2-track, STB/54

Concertapes, Symphony of Dance, The Musical Arts Symphony; Leonard Sorkin, conductor, 4-track, 4T-3003

Everest, Shostakovich: Symphony No. 5, Leopold Stokowski conducting the Stadium Symphony Orchestra of New York, 4-track, STBR-3010

Kapp, Songs of the Fabulous Forties, Roger Williams, 4-track, KT 45003

Kapp, Songs of the Fabulous Thirties, David Rose and His Orchestra, 4-track, KT 45004

Kapp, Marches in Stereo, John Gart at the Conn Electronic Organ with The Minute Men, 4-track, KT 41005

Kapp, Hollywood Themes in Stereo, Frank Hunter and His Orchestra, 4-track, KT 41006

Kapp, Paris In Stereo, Raymond Lefevre and His Grande Orchestra, 4-track, KT 41009

Kapp, Once Upon A Mattress, Original cast from musical, 4-track, KT 41012

MGM, Secret Songs for Young Lovers, Andre Previn—David Rose and His Orchestra, 4-track, ST 3716

RCA, New Sounds at the Roosevelt, Larry Elgart and His Orchestra, 2-track, EPS-244

RCA, Pat Suzuki's Broadway '59, 2-track, EPS-247

RCA, Pat Suzuki, 2-track, BPS-239

RCA, Strings Aflame, Esquivel and His Orchestra, 2-track, APS-227

RCA, Rendezvous in Rome, The Melachrino Strings and Orchestra, 2-track, BPS-218

RCA, An Evening With Lerner & Loewe, Robert Merrill, Jan Peerce, Jane Powell,

Phil Harris with the RCA Victor Symphony Orchestra, 2-track, GPS-242

SMS, Twilight Time, The Monarchs of Melody, 4-track, S8

SMS, Dancing Under the Stars, Ashley Adams and His Society Orchestra, 4-track, S9

SMS, Bruckner-Symphony No. 7, E Major, Symphony Orchestra of the Southwest German Radio, Baden, Baden; Hans Rosbaud, conductor, 4-track, S11

Verve, The Greatest, Count Basie plays, Joe Williams sings, 4-track, VST 4-204

Verve, Ella Fitzgerald Sings the Rodgers and Hart Song Book, 4-track, VST 4-205

Verve, Porgy & Bess, Ella Fitzgerald; Louis Armstrong, 4-track, VST 4-206

Warner Bros., The King and I For Orchestra, Arranged and conducted by Warren Barker, 4-track, WST 1205

Warner Bros., 77 Sunset Strip, Musical direction by Warren Barker

Warner Bros., World Renowned Popular Piano Concertos, George Greeley guest pianist with Warner Bros. Orchestra, 4-track, WST 1291

Warner Bros., Broadway '58-'59, Eddie Le Mar, His Piano & Orchestra, 4-track, WST 1304

CARTRIDGES

RCA, Sounds in Space, Ken Nordine narrator, 4-track cartridge, KD1

RCA, Rachmaninoff, Rhapsody on a Theme of Paganini, Rubinstein-Reiner, Chicago Symphony Orchestra, 4-track cartridge, KCS-2005

RCA, Tchaikowsky, Violin Concerto in D, Heifetz-Reiner, Chicago Symphony Orchestra, 4-track cartridge, KCS-3002

RCA, Beethoven "Emperor" Concerto No. 5, Artur Rubinstein, pianist; Symphony of the Air, Josef Krips, conductor, 4-track cartridge, KCS-4009

TAPE IN EDUCATION

OUR comments in the last issue regarding possible simplification of recorders used in teaching has evoked some comment. Among those received was this note from Mr. Richard S. Levy of Buffalo.

"Having sold tape and machines to many schools the writer found your September column of considerable interest.

"Mrs. Barnell's first point should also mention the shameful neglect of many recorders by most schools. I've just arranged overhauls, by top technicians, for two school machines and found they have had virtually no work done on them for six and nine years respectively! They were both in bad shape.

"As to your evaluation of controls, how could a teacher rapidly index a particular passage or selection in a tape without a high-speed transport in both directions? (Unless she used a rewriter, meaning additional equipment and problems.)

"Also, anyone who has encountered the usual variety of tape equalizations and quality wouldn't trade a tone control for frustration. Many minor recording errors can be somewhat compensated for in playback.

"Bravo for suggesting better A-V courses and simpler controls on machines."

We did not question the necessity of a fast forward or rewind or index from the standpoint of their need if it was desired to locate a particular portion of the tape. What we questioned was the necessity for those controls based on actual use—and we do not believe anyone has found the answer to this as yet. In other words, does a teacher put a tape on a machine and play it all the way through, or does she skip back and forth in the tape? If the former is true then perhaps the control is not needed, if it is not true then the control performs a necessary function and should remain.

We also received a copy of Califone's newest language lab catalog and one of their new tape machines is a case in point. Their model LP-902, the Simplex, has a number of unusual features. It has only two controls, one for record/play/stop and the other for fast forward and rewind. It also has an index counter for locating a particular part of the tape.

In addition to these simple controls, both the tape and heads are completely enclosed so that the student cannot touch them. The machine uses 5" reels running at $3\frac{3}{4}$ ips to give 30 minutes of recording time.

All volume controls are pre-set, including the record level control. A light flashes when the end of the tape is approaching and if the machine is not stopped, the light will continue and the reels stop without the tape coming off.

While this machine is for a student station in a language lab, it does illustrate the principle we had in mind, that of simplifying the mechanism so that no one need be afraid of it, teacher or student.

There is no question but that tape has taken over completely in the teaching of languages insofar as efficiency and good

results are concerned. There is nothing like being able to hear yourself as others will hear you, which is what tape provides. Self-analysis of mistakes and corrections of them are easier and more positive.

It is difficult for a teacher to describe a mistake in sound, just as it is difficult to put any sound into words. However, when the pupil can hear his own voice and compare it with the voice of the instructor on the tape, then he has some idea of the kind of correction that must be made to bring his pronunciation into line with that of the authority.

Another blessing of tape in the teaching of languages is the avoidance of any local coloration or inflection. If the tapes are narrated by a native speaker, as they should be, then the language learned by the student will be the pure form.

It is possible to learn a foreign language with a built in accent if the teacher does not speak it purely. Suppose, for instance, that a native German or Frenchman, or any other nationality learned to speak English in this country but never did get rid of his accent. Suppose further, that he returned to his homeland and set himself up as a teacher of English. Then his students would all learn to speak English with his accent automatically incorporated in it. Local variations in speech can also creep into language teaching if care is not taken to keep it out.

With tape and native speakers, all of

this is eliminated at one stroke. There is no question but that the language learned by the student will be the correct form.

Any of the audio arts, such as singing, public speaking and the like can all profit through the use of the tape recorder as has been proven time and again in actual practice.

Not yet proven, is the use of the recorder in such subjects as chemistry, physics and math and it is in these and similar fields that research must be done.

We can easily envision a recorder used in physics as a sound producer and recorder during experiments covering that phase of the subject. We can see it used as a step by step instructional device for giving directions for lab experiments in chemistry and we know it has been, and is, used by students for assistance in any memory work, such as multiplication tables or geometry theorems.

But there should be much wider applications possible in all of these fields and alert teachers will discover them and make life easier all around. We shall be glad to report in these columns, any new developments or methods utilizing tape that teachers find to be helpful to them.

Mr. Levy, in his note, mentions the poor maintenance practices found in most schools in relation to recorders and, we suspect, other electro-mechanical equipment as well. We will plan to devote space in this column in the next issue to covering the necessary maintenance of a tape recorder which is subjected to classroom use. Actually such maintenance is simple—it just needs to be done.



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RECORDER**

note to
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Opelika, Alabama

CROSSTALK

from the Editors

THOSE WHO HAVE THE ability to recognize a trend while it is hardly apparent and then ride that trend to its peak are the ones who win the plaudits or make the money.

* * * * *

THE SURFBOARDER CLIMBS aboard a wave while it is in its infancy and as it grows and gains speed he is lifted to the top. Those who try to board the wave after it has grown generally are passed by and founder as the next wave clobbers them.

* * * * *

WE CAN TELL YOU WE ARE IN a position to keep tabs on the tape industry. Into our office flows news from all the companies. There is a powerful groundswell developing in tape. The wise dealer will start to paddle with the wave now—so he won't be left later. How do we know?

* * * * *

WHAT INDICATIONS DO WE HAVE? Why are we so sure? Here are the reasons: First, the recent technological breakthrough into four-track recording. Few people seem to recognize this for what it is . . . the beginning of a new era in recorded sound. Just as the LP record and the 45 forced the 78 into the discard so tape will outmode present methods of sound reproduction. People are slow to accept a revolution like this because they do not see it clearly. But it is there none-the-less. With ever increasing speed, tape will gain and gain and gain. The dealer who is with it will profit the most.

Another straw in the wind is the number of firms now in the field of recorded tape music. A count of noses reveals 33, including the big boys. The month of October alone will see the release of 100 new four track tapes. This does not compare with the flood of new discs BUT four months ago the number of new tape releases was none! From none to 100 is a dramatic increase, the beginning of the groundswell you can ride to higher profits.

Or take the case of prices. Stereo tapes containing as much music as a stereo disc sell for as little as \$4.98. Most of them cost a dollar more than the disc but will last a lifetime, which the disc will not. But a double album on tape costs about half the price of the amount of music on two stereo discs. Here is real economy with quality.

Let us give you a specific example. Concertapes brought out two volumes of their "Sound in the Round." Each of these two-track stereo tapes sells for \$11.95—that's \$23.80 for the two. When the stereo disc blossomed, they brought out the same thing on discs—two discs at \$6.95 each or \$13.80. When four track tape came into being Concertapes put both on one reel of tape for \$7.95. This kind of saving translates into satisfied customers.

Or take the case of the recorder manufacturers. One has added a night shift, some are in back order situations that aren't getting any better fast. One importer is completely sold out and is waiting anxiously shipments from overseas. Sales managers in their swings around the country are reporting enthusiastic receptions of the new merchandise by wide-awake dealers—not only enthusiastic receptions but orders for the new merchandise.

* * * * *

SO AGAIN we say it is the wise person who can spot a trend and get aboard while others continue their old fashioned ways, only to awaken too late. The time for you to act is now. The cost of starting is low, the profits secure. Why wait?

P.S. We can help you—use the enclosed card.

The Editors

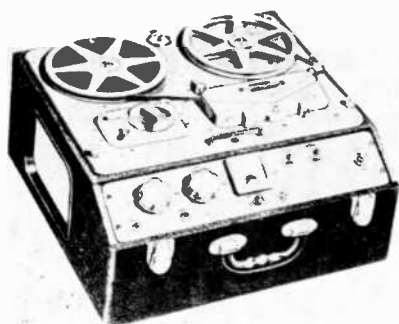
NEW PRODUCTS

JAPANESE IMPORT



Hosho of America, Inc., 1549 North Vine Street, Hollywood 28, Calif., has announced that shipments to distributors have commenced on their new Model 105 portable tape recorder. The 105 is dual speed ($3\frac{3}{4}$ and $7\frac{1}{2}$ ips); has twin speakers, remote control, precision transport mechanism with dynamically balanced flywheel assembly, super precision optically lapped heads, high frequency erasure, magic eye record level indicator, earphone, extension speaker jack, extension audio cable, input for recording directly from radio, television, or phono, internal cooling fan and table stand. It is priced at \$129.95. For further information, contact the above distributor.

FERROGRAPH 808



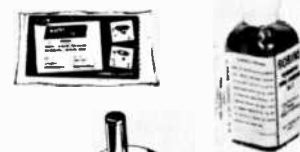
The British Ferrograph Recorder Company of London has announced the new Ferrograph 808 series of professional stereo units. Both the standard half-track and quarter-track machines are available for recording and playback with $3\frac{3}{4}$ and $7\frac{1}{2}$ ips tape speeds. Features include frequency response plus or minus 2 db of 50-10,000 cps at $7\frac{1}{2}$ ips; signal-to-noise ratio is better than 50 db; wow and flutter less than .2% at $7\frac{1}{2}$ ips; three motors including one hysteresis synchronous drive motor for driving capstan; recording level VU meter; and auto-switch cutoff and azimuth head adjustment for heads. Both the 808/4 (four-track) and the 808/2 (two-track) are priced at \$595. For additional information, write to Ercona Corporation, 16 W. 46th St., New York 36, N.Y.

(Continued on page 17)



the perfect gift
for every tape
recorder owner

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 - Tape Threader for quick easy handling of tape.
 - Head Cleaner protects both tapes and equipment by removing dirt, grime and accumulated oxides from head.
 - Tape Cleaning Cloth cleans, lubricates and protects with microscopic film of Silicone on tapes.
 - Tape Clips keep tapes from unwinding from reels.
 - Reel Labels perfect way to identify and catalog your tape library.
 - Tape Editing Book tips on editing and splicing help you obtain optimum performance.
- Only \$12.00 list.

ROBINS GIBSON GIRL TAPE KARE KIT TK4-JR

Contains: Gibson Girl Junior Splicer, Splicing Tape, Tape Threader, Head Cleaner, Tape Cleaning Cloth, Tape Clips, Reel Labels, Tape Editing Book. List only \$10.00.

ROBINS GIBSON GIRL TAPE KARE KIT TK4H

Contains: Gibson Girl Hobbyist Splicer, Tape Cleaning Cloth, Splicing Tape, Tape Clips, Tape Editing Book. List only \$3.50.

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QUESTIONS AND ANSWERS

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

Educational Tapes for Blind

Q This is starting the third year of taking your wonderful magazine and I sure do like it. The months seem long between issues. Please keep up the good work. The obvious disregard of tape by the so-called Hi-Fi magazines makes your work that much more important to the people who know and like to use tape. Thanks for a great magazine.

I have two problems you might help me with as I am at a loss to find answers.

1—Could you tell me if there are tapes of regular school lessons that the blind youth could borrow to keep up learning, especially 6th grade through high school. Where can I get more data about them.

2—I have a stereo recorder and the sound of motors running, and static get on my tapes during playback. The wife's range, sewing machine, sweeper and any defective tube in the recorder causes all the static noise to end up on the tape. I've ruined \$40 worth of good stereo tapes with this noise that comes on the tape and stays. Before I play them now, I go all over the house and turn off all electrical appliances before I dare play stereo tapes. Your help will be gratefully received and please—keep your wonderful magazine coming. —W.F.B., Yakima, Wash.

A Regarding grade school material for blind children we would suggest that you contact the following: Blind Services Division, Library of Congress, Washington, D. C., American Printing House for the Blind, Louisville, Ky., American Foundation for the Blind, W. 16th Street, New York, N. Y. You might also consult your local organization for the blind.

Regarding your recorder trouble, we suggest that you have the components and the wiring checked by a competent technician or at the factory. The behavior you describe is not normal and there is something definitely wrong. When your recorder is in playback there should be no way of having anything additional recorded on the tape unless there was a short inside the machine.

Line noises can be removed through the use of a line filter, obtainable at a radio parts jobber. The Cornell-Dubilier "Quietone" filter is one, there are others.

These filters are plugged into the wall outlet and then the recorder is plugged into the receptacle on the case of the unit. The units are small and inconspicuous.

Adding Voice to Music

Q I enjoy your magazine very much—can't wait to receive the next issue.

I have a V-M recorder with stereo speaker and recently purchased a Garrard changer with a Recoton-Goldring magnetic pickup. The recorder has a phono input and a magnetic phono input. With the magnetic input I get very good results, however, when I care to add voice to music, I find it neces-

sary to plug in the mixer and into the phono input. This in turn gives me excellent voice but the music is awful. I would very much like to know what I am doing wrong? Do I need a different cartridge? I am using a Shure Dynamic mike. What I would like is to get the music as clear as the voice in the phono input and vice-versa in the magnetic input. Can anyone help me out?—S. B., Flint, Mich.

A On the V-M the magnetic phono input has a built-in pre-amplifier which is equalized for recording from or playing from magnetic cartridges. This additional amplification is needed because the output from the magnetic cartridge is very weak. When you plug the magnetic cartridge lead into your mixer, the voice is overriding the signal. In addition, the magnetic cartridge is a high impedance device whereas the mixer input probably is not. You will need to pre-amplify the level of sound from the cartridge until it matches that of the mike if you are using a simple potentiometer-type of mixer. An electronic mixer should be able to handle the difference between the two and give you what you want.

Sound-on-Sound

Q Please tell me how I can make live sound-on sound recordings with my Tandberg model 5-2 quadruple stereo tape recorder? I also have a Wollensak 1515 stereo playback recorder in case this may be needed.

Please also inform me what recorders are now available which are three-speed and will record stereo as well as playback and erase stereo tapes. R.M.K., Annandale, Va.

A Sound on sound with two recorders is easy. Record the first part on recorder number 1. Then while playing back that tape on recorder number one, record the second part on recorder number two.

In your case, this is the procedure you will have to follow. The Tandberg 5-2 can record sound-on-sound by itself only with modifications to its circuitry and this must be done by an authorized Tandberg service station or the factory.

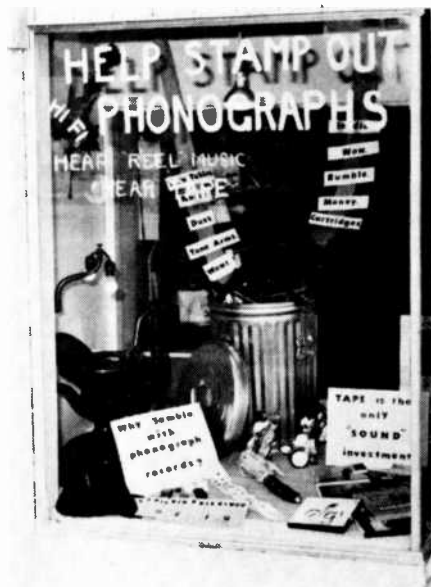
Thus you will have to record your first part on the 1515. Then connect the 1515 electrically (output of the 1515 to input of the Tandberg) and plug headphones into the playback input terminals on the back of the Tandberg. The factory has advised us that there is enough power at this point to drive headphones at a satisfactory level. With the phones on, you can then hear the first track which will be recording on the Tandberg. At the same time you play or sing into the Tandberg mike and both sounds will be recorded on one track. You will have to adjust the volume levels of the input from the 1515 and the microphone to achieve the effect you desire.

According to our information the Nor-elco, Tandberg, Telectro and Webcor lines have three speed stereo models.

FEEDBACK

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

Dealer with Convictions



To the Editor:

Congratulations and hurrahs on your Crosstalk of the September issue. We have been trying to put the idea across for months that tape is better than phonograph records so your editorial gave us a big lift.

We also believe that 4 track tape should have at least 30 minutes on each side to be any good. Two track tape should be continued because of better quality, especially on inexpensive recorders. We think the tape cartridge is a mistake and should be discontinued.

We are continuing our campaign to "Help Stamp Out Phonographs." Our present window has a lot of gambling equipment in it with a sign, "Why Gamble with Phonograph Records?" The other half of the window is full of stereo tapes and a big sign "Tape is the only SOUND investment."—*John Schmidt, True Recordings Co., Oakland 11, Cal.*

It has been our experience that the new four track tapes are as good, or in some cases better, than the two track. Good luck in your campaign.

Tape Economy

To the Editor:

Last year I purchased a Tandberg 5-2 and thus entered into the stereo tape field, little realizing what a chaotic state they were in because of the stereo disc and delay in the RCA cartridge.

After a few harrowing months when tape seemed doomed I was happily relieved to note that the RCA cartridges were at last being sold and 7½ ips reel-to-reel tapes were about to be introduced. Having ac-

quired a reasonable library of the conventional 2-track tapes I tried to get a cartridge. A full month passed from the day I ordered it to the day I received it.

Well, at last I had a cartridge (and have since gotten another), which I played by transferring the tape to reels. More recently, after following their progress in your fine magazine, I acquired one of the 4-track, 7½ ips reel-to-reel tapes.

To my ears, the old 2-track tapes were far superior to records. As for the cartridge tapes they sound just about as good as the stereo discs I've heard although not quite as good as the 2-track tapes. And those 4-track reel tapes! They are absolutely magnificent; better than the discs or other tape forms.

My hat is off to David Beatty, who, in your September issue, suggested longer-play tapes. I've contacted several manufacturers concerning releases such as Mahler's "Resurrection" symphonies or Handel's "Messiah" but they are mum.

One more point: the packaging of the cartridges obviously hikes up their cost. This means that the cartridges which theoretically could have twice the music for half the cost of production, price about the

same as a new 4-track, 7½ ips reel tapes. Why not have 4-track, 3¾ ips tapes on reels at a price lower than that of stereo records (for example \$4.98 for a half hour and \$6.98 or \$7.98 for an hour?) Then the economy of the tapes in itself would turn much of the mass market to these tapes while those who wanted still better quality could buy 7½ ips tapes on reels.

In the September issue you mentioned a tape which represented a \$5.00 saving over its disc equivalent. Could you identify that tape please?

Your magazine is always extremely interesting and appears to be a major spark for the manufacturers.—*Tom Geisler, E. Orange, N. J.*

The \$5.00 saving was for Concertapes Sound in the Round 4-track tape release.

Threading Simplicity

To the Editor:

Retrence is made to the first few paragraphs in your "Crosstalk" section in the current issue. (*about the ease of threading tape—Ed.*) It might be interesting to you to know that I lost my right hand in an 1908 accident. Although I wear an artificial hand I can and do thread my recorder with one hand and this is done easily and successfully. I have done this with machines larger than the one I own also. In addition, I am a 16mm film projectionist and have found no trouble in threading a projector. So, I know threading a tape recorder can be and is very easy for anyone who exerts a wee bit of "think power."—*J.C., Los Angeles, Calif.*

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TAPE CLUB NEWS

Financial Report

The Voicеспondence Club has recently distributed to its members its seventh annual financial report. The report shows that for the fiscal year ended April 30, 1959, the club took in \$3180.72 in current income and had expenses of \$2844.96. The balance sheet shows that the club has assets of \$4220.54. Along with the issue of its magazine containing the financial report, Voicеспondence members received their 8th complete directory, representing membership in some 34 different countries.

Tape Exchange Benefits

At present, members of Club du Ruban Sonore exchange tapes with members in Africa, Haiti, Europe, U.S.A., and Canada. Besides social talk, they also exchange recordings of music of their respective countries. Some members are learning new languages by corresponding with folks in foreign lands. Membership in this club which has mostly French speaking members is increasing and we wish them continued success.

"Bilingual" Definition

Should anyone have been wondering what the first part of the Bilingual Recording Club of Canada name stands for, it is because the club's main body consists of two lingual groups which are French and English and therefore these two languages are mostly used in the club's tape-correspondence. Also, members' lists and circulars published by headquarters are printed in both languages.

World Tapes for Education Distribution

The World Tapes for Education program of World Tape Pals has been progressing and recently underwent some changes. This program is a service for teachers and students.

Robert L. Brunson, recording supervisor for the Oklahoma City Public Schools has accepted the post of Director of the WTE Library which has been moved from Dallas to Oklahoma City. His acceptance of directorship was encouraged by Melvin W. Barnes, Oklahoma City superintendent of schools, and his immediate supervisor, Clifford Costley, director of instructional materials.

Bob will have use of school recording equipment for dubbing the tapes, in addition to volunteer assistance from students and teachers interested in developing this new educational medium.

A Board of Review, composed of educators, has been set up to pass on suitability of tapes for inclusion in the WTE Library.

James H. Boren, former professor of psychology and education at Arlington State College in Texas will retain chairmanship of the International Committee on World Tapes for Education and will work

closely with Brunson in promoting WTE.

East Pakistan Bishop Joins CTRI

His Excellency Bishop Raymond Larose of Chittagong, East Pakistan has joined Catholic Tape Recorders, International. His Excellency's application for membership stated an interest in catechetical work and guitar music. Bishop Larose is French-Canadian and his mother tongue is French. His Excellency conferred blessings upon the club and sent along a tape which had an oriental flavoring.

JOIN A CLUB

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

AURORA SCIENCE TAPE SOCIETY
Walt Richard Sheasby, Jr.
215 North Baldwin Ave.
Sierra Madre, Calif.

BILINGUAL RECORDING CLUB OF CANADA
J. P. Paquette, Recruiter
1993 Morgan Boulevard
Montreal, Quebec, Canada

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

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

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

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

THE VOICESPONDENCE CLUB
Charles Owen, Secretary
Noal, Virginia

UNITED RECORDING CLUB
Richard L. Marshall, President
2516 S. Austin Boulevard
Chicago 50, Ill.

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

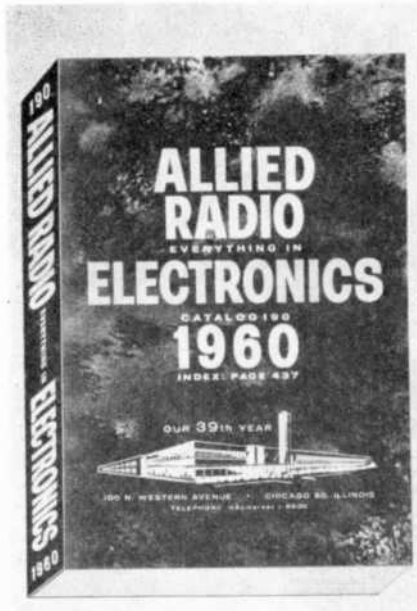
FOREIGN

AUSTRALIAN TAPE RECORDISTS ASSOC.
John F. Walen, Hon. Secretary
Box 970H, 6, P.O. Adelaide, South Australia

BRITISH TAPE RECORDING SOCIETY
Peter M. Bardach, U. S. Representative
210-16 Grand Central Parkway
Queens Village 27, N. Y.

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

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



Allied Radio Corp., 100 N. Western Ave., Chicago 80, Illinois, has announced the release of its 1960 general catalog. It lists over 40,000 items and has 444 pages which include 232 pages in rotogravure and four color covers. Special emphasis is placed upon stereo and monophonic high fidelity music systems for the home. The large selection of sound equipment includes individual amplifiers and complete, easy-to-set-up sound systems. A complete line of individual components is shown. A large section is devoted to the latest tape recorders, and another to a listing of stereo tapes and discs. There is an expanded line of 70 electronic kits, and a complete parts listing is also featured. A copy will be sent without charge, upon request. Write to Allied.

SLIDE SYNCHRONIZER

Audio Slide Corp., 314 West Dominick Street, Rome, New York, has introduced the Audio Slide Synchronizer. This simple instrument readily adapts any standard tape recorder and any standard automatic projector into a fully integrated system of synchronizing tape and slides. Slitting of the tape is accomplished by passing regular 1/4 inch polyester recording tape through the Synchro-Slitter that comes with every kit. Both monaural and stereo playback can be used with equal fidelity. The Synchro-slit tape is passed through the Audio Slide Synchronizer and threaded through the recorder in the normal manner. The Synchronizer's activating arm "feels" the slit and automatically changes the slides as the tape plays in its normal manner. This method of synchronization insures the greatest accuracy of timing because it is an integral part of the tape which is played back. The Audio Slide Synchronizing Kit is priced at \$59.95. Contact the manufacturer for additional information.

In the British Tradition!

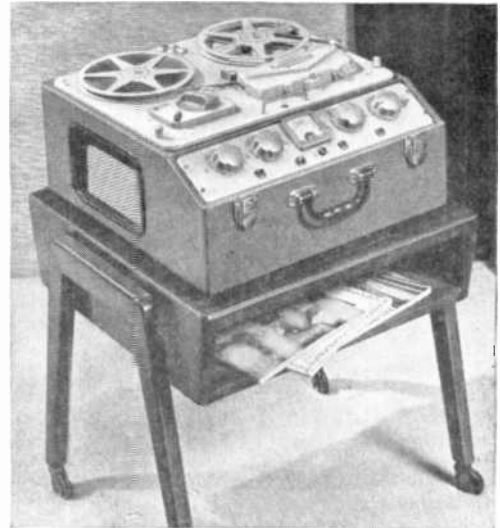
In these days of factory mechanisation on the grand scale—where success so often is measured only in terms of ever-expanding output—people tell us that it is refreshing to meet a manufacturer imbued with the quaint idea of refusing to grow big.

But it is quite true. The success of the Ferrograph during the past ten years has been due entirely to our deliberate decision to make *quality* rather than quantity our sole objective. Not for us models to suit all pockets or Tape Recorders built down to a price to compete in world markets. Instead, to maintain our high standards without compromise we have chosen to restrict our output.

We believe that a Tape Recorder, being an instrument of high mechanical precision, needs a great deal of critical and unhurried supervision at every stage of its manufacture which it would be difficult to carry out in a factory geared to large scale production.

This then is the Ferrograph tradition. It is based upon a policy of utilising to the full the wealth of technical knowledge and craftsmanship that is still part of Britain's heritage.

Today all who are seriously interested in tape recording—and this includes



those who use the Ferrograph professionally in scientific and industrial research, in the teaching of music, drama and languages, in the manufacture of gramophone records, in the exploration of far-away places, in radio and home entertainment—know that Ferrograph equipment is the best that money can buy.

Ferrograph Series 4A

Fitted with three independent motors, including synchronous main drive to capstan, with recording level meter and interchangeable plug-in heads. Two speeds (3 1/7 1/2 or 7 1/2/15 i.p.s.) with automatic changeover to correct compensation network. Fitted with Brief Stop, gear-driven Turns Counter and with provision for additional stacked Head for stereo playback conversion. 2 1/2 watts of undistorted output through high quality elliptical speaker. Auto Stop instantly stops motor drive when spool is empty or tape breaks. **\$399.50**

Ferrograph Stereo 808

An all-purpose instrument permitting full stereophonic recording and playback together with conventional half track monophonic recording and playback. The output of all channels (stereo and mono) ends at low level so that owner can conveniently make use of his existing hi-fi amplifiers and loud speaker systems. General specification and mechanical features similar to Ferrograph Series 4A. **\$595**

Ferrograph Stereo 808/4

Mode: 808/4 records two-track stereo and monophonic tapes and plays four-track stereo, two-track stereo and monophonic tapes. As with Mode: 808 the output of all channels ends at low level thus permitting existing high fidelity amplifiers and loud speaker systems to be used. General specification and mechanical features as Ferrograph Series 4A above. **\$595**

The Incomparable
Ferrograph

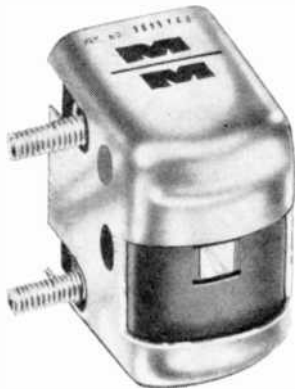
Manufactured in England by

BRITISH FERROGRAPH RECORDER CO. LTD

131 SLOANE STREET, LONDON, S.W.1 and SOUTH SHIELDS, ENGLAND

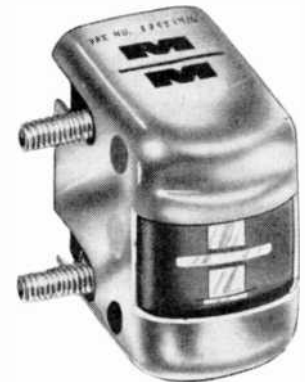
U.S. DISTRIBUTORS: Ercona Corporation, 16 West 46th Street, New York 36, N.Y.

CANADIAN DISTRIBUTORS: Astral Electric Co. Ltd, 44 Denforth Road, Toronto 13



Heads You Win

by Charles F. Murphy
President, Michigan Magnetics, Inc.



... making heads for your recorder makes head-aches for head makers.

ANY review of the progress in magnetic head technology must begin with the invention by Valdemar Poulsen, in the 1890's, of the first head for wire recording. In terms of today's advanced equipment this first unit was crude indeed, having a gap of $1/16$ " which recorded sounds only in the voice range frequencies and at a speed of 60" per second, or over 4 miles per hour. Nonetheless, Poulsen's device incorporated essentially the complete principle of magnetic recording as we know it today.

This principle is comparatively simple: if magnetic impulses are forced to jump the gap between the two pole pieces of a magnet they tend to spread out in an arc as they make the jump; if a piece of magnetic material passes through this arc, some of the flux will "rub off" on it so that the material becomes magnetized in a pattern conforming to the frequency and amplitude of the impulse jumping the gap; when these impulses correspond to the frequency and amplitude of sounds such as voices or music, the sounds are reproduced when the process is reversed and the impulses are taken from the magnetic material, passed back through the magnet, amplified, and used to actuate a speaker cone.

The entire process of refining and perfecting magnetic heads has been devoted to extending the frequency range that can be recorded and increasing information density on the tape . . . that is, making it possible to get more time and more accurate reproduction on less tape. Users of tape recorders have consistently demanded slower and slower speeds which mean greater economy in the use of tape and less wear on the head . . . in its turn each new demand has required new developments in the construction of heads with smaller, higher definition gaps, plus better tape as well as refinements in other recording and playback components.

The history of modern magnetic recording dates from 1943 when American technologists acquired German Mag-

netaphones, which were designed to run at 30" per second and reproduce frequencies up to 10 to 12 kc. By engineering refinements on the Magnetaphone we were able to make them reproduce up to 15 kc which approximates the upper limits of hearing. By 1946 head and tape technology advanced to the point where recorders were available which traveled at 15" per second maintaining the same quality, and approximately a year later this was again cut down to $7\frac{1}{2}$ " per second.

The demand for greater information density continued, but it appeared that at a speed of $7\frac{1}{2}$ " we had reached the point of diminishing returns in speed reduction because of mechanical problems involved in regulation of slower speeds and their resulting "wow and flutter." To maintain fidelity and still meet the demand for economy in



"For ladies only" might be the tag on this delicate job of inserting the super-thin foil in the head at one stage of the assembly.

the use of tape, heads were developed about 1949 which would print a program on one-half of the same $\frac{1}{4}$ " tape, as had previously been used as a single track, resulting in a reel which could be turned over after one playing and run again to play a new program on the second track for an equal length of time.

By 1956 the long-desired goal of stereophonic recording was accomplished by a commercial recorder with two staggered heads, each of which used one of the two tracks on a tape traveling $7\frac{1}{2}$ " per second: we had now sacrificed the most recent development toward information density in order to have stereophonic reproduction. A year later a single inline head with two magnetic elements was introduced for stereo reproduction without the inherent problems of a second head. Nonetheless, the demands of audiophiles continued and the head manufacturer found that his customers would not be satisfied until he produced a unit that would travel at one-half the speed currently available, maintain hi-fidelity reproduction to 15 kc, and

(1) THE PROFILE OF THE GAP

This is the most critical factor in determining the quality of sound reproduction. In order to understand it we should consider the minute size of the gap and the activity that is going on within it. On a modern magnetic head the gap between the two pole pieces is a nonmagnetic area 150 microinches (millionths of an inch) long by 43,000 microinches wide. Illustration A suggests how a section of magnetic tape passing by this gap might look greatly magnified. As this section of tape, only 150 microinches long, passes by the gap, the magnetic particles on it are given a positive or negative charge. In order that the sound be reproduced exactly, the same group of particles must line up in the gap at any instant during playback that were there during the same instant of recording. This can only occur if the gap is perfectly straight up and down and if its edges are "perfectly true." We deal in exceedingly fine tolerances . . . an ordinary ruler would be considered "perfectly true" if its edges were out of line by many times the



In addition to the electrical inspection, each head is subjected to a visual mechanical inspection on a device which presents a very greatly magnified image. The girl in the foreground uses a binocular microscope and a measuring gauge which indicates whether or not the heads are within the tolerance limits. All photos are from the Allegan plant of Michigan Magnetics.

have two complete stereophonic programs on a quarter inch tape. We are meeting these demands with today's modern 4-track head.

I have entitled this article "Heads You Win" to point up the fact that it has been through the efforts of head manufacturers to refine and develop magnetic tape recording heads that would meet the audiophile's rigid demands that you have "won" the advantages built into today's modern recording equipment. In making these refinements, in creating new units to meet your demands, and in making use of new processes and new materials we, as manufacturers, are constantly re-examining and re-evaluating the technological factors that determine the design of the head.

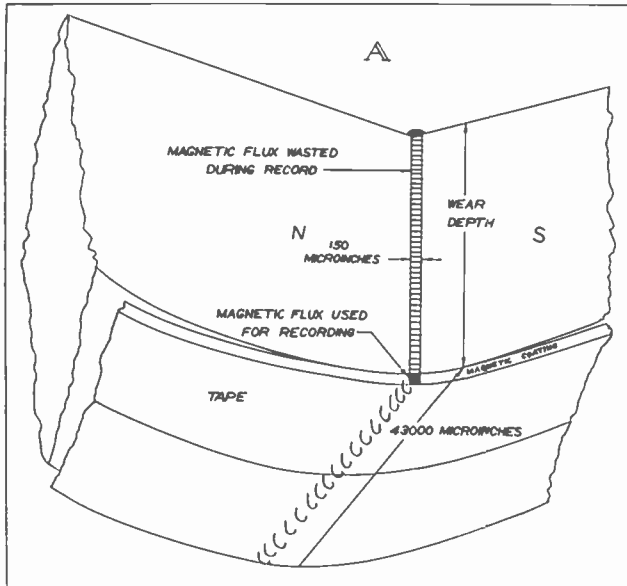
Broken down to their most basic form, there are four important factors which we consider in designing each new unit . . . let us examine each of these in terms of its effect on the design of the head and ultimately on the recording and reproduction characteristics achieved.

total width of the gap on a magnetic head. When the whole area under consideration is only 6 millionths of a square inch, the most minute variation is critical. For example, at high frequency where the total impulse is hardly longer than the gap, an infinitesimally small variation, or raggedness in the edges of the gap, would destroy fidelity.

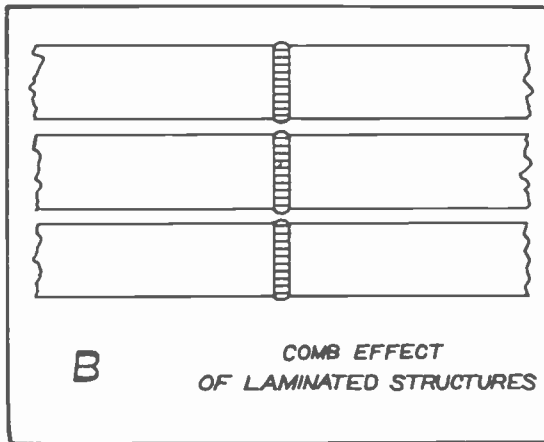
Quite apparently the most effective way to achieve the absolute uniformity necessary is by precision production of a single piece of metal. All other factors being equal, or nearly equal, finest precision quality and economy indicate the use of such a one piece component.

(2) THICKNESS OF POLE PIECE

It is a generally recognized engineering principle that the thicker you make a piece of magnetic metal, which is to carry flux, the poorer the frequency response will be. This tends to be less noticeable with low frequencies because they tend to travel through the entire piece of metal, but higher frequencies have a tendency to crowd toward



Drawing above shows pole piece and tape. The gap length, in this drawing shown as 150 micrometers, is very important to the recording and reproducing characteristics of the head. The flux indicated by the loops does the recording, that which jumps across the gap farther back is wasted.



The drawing B illustrates how the magnetic flux not only jumps the gap but will also jump the still finer gaps between the laminations in a laminated head structure. Drawing C shows the flux path that occurs in a laminated head if the head is not properly constructed and the laminations are out of line.

the outer surfaces leaving a core of metal which is not being used and which results in a loss of output. If a piece of metal becomes too thin it will not be able to carry enough flux . . . on the other hand if it is too thick it will lose its capacity to reproduce hi-frequency sounds.

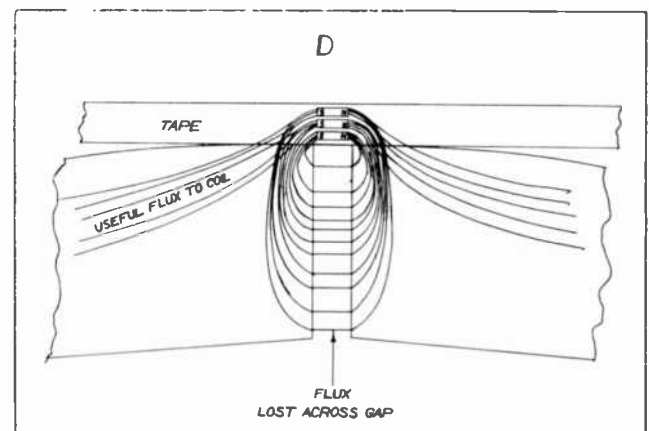
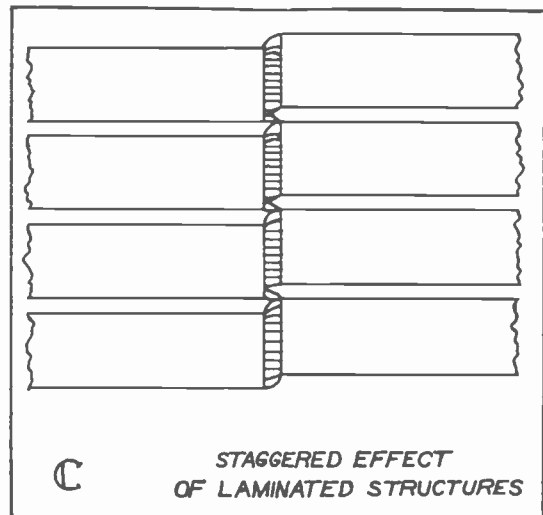
Inasmuch as we cannot afford to allow the very fine edges of the gap to become saturated with magnetic flux (where it is concentrated) to an extent approaching 10% of the gap width (15 micrometers), then it seems unlikely that we have any problem of saturation of the rest of the core piece almost regardless of cross-sectional area. Because core losses or iron inefficiencies are a matter of watts per pound, it becomes important to use as little iron as possible in the structure.

For this reason we come to the conclusion that instead of using thin laminations in the head structure following the practice of transformers and motors, we are dealing with such infinitesimally small power that we can now use one thin lamination and still carry adequate flux to completely magnetize the tape. Additional material of the same

thickness cannot improve frequency response. Indeed, we must depend on complete insulation between laminations to prevent deterioration of frequency response.

The gap, of course, is the lens through which the coil sees the information on the tape, and as such, is still the most critical part of any head. It must be held to a length $\pm 10\%$ including deviations from straightness, roughness, and spacer tolerances. We are now talking of variations of 15 micrometers. Variations beyond this WILL cause far greater performance variations than core material or core configuration.

Among these are the "comb effect" and the "staggered effect." The "comb effect" refers to the fact that the magnetic flux not only jumps the gap between the pole pieces but likewise jumps the still finer gap between the laminated pieces, and in doing so it spreads out in small arcs which we consider to be a flaw in the gap, as in Sketch B. The "staggered effect" refers to the fact that, except under the most demanding and costly precision controls, there is a probability that the several laminated layers of one pole piece will not line up exactly with the matching layers of the opposite pole piece. This would create distortion of the gap—Sketch C. To obtain the very best gap possible, and



Drawing D shows how some of the magnetism produced in the head is wasted as it feeds through the gap depth.

for maximum uniformity in production, it now appears that a single laminar structure with as little core material as is practical to handle, most nearly meets all of the requirements of today's hi-fidelity, low-noise-level tape recorders.

It should be mentioned at this point that it is possible to

overcome the physical flaws in laminated pole pieces through excessively difficult and very expensive engineering and manufacturing techniques; however, this has been possible only in extremely expensive heads which, from a cost standpoint, are only practical for commercial and professional equipment.

(3) MASS OF POLE PIECE

The total mass or amount of metal involved in the construction of the pole piece is of technological importance because of the tendency of metals carrying magnetic flux to become permanently magnetized. If this should happen, lower quality reproduction as well as damage to tapes can occur. The problem here is in playback . . . if magnetic impulses remain in the head after the power used in recording is turned off, then these impulses will not only be reproduced as noise during playback, but they can likewise harm the tape by changing its magnetic characteristics. Even slight changes, if they occur where high frequencies are recorded, can completely destroy an audible tone. In other words, a head which becomes permanently magnetized could erase high frequency signals.

The tendency toward permanent magnetization varies directly with the mass of the pole piece . . . as a result this effect is minimized as the pole piece is miniaturized. This again, mitigates against laminated design because the physical requirements for production, handling and assembling laminated units makes it necessary for them to be larger . . . though the faces of the pole pieces will measure the same in either type of construction, the metal extends farther back into the head in laminated units. In addition, other effects result from excessive gap depth, which brings us to the fourth consideration in head design.

(4) GAP DEPTH

In the early days of magnetic recording it was necessary that the gap be made as deep as might be practical in order to provide for wear. Wires and early tapes, moving at high speeds, were highly abrasive. Pole pieces of minimum depth would literally wear out by being worn through. Today, however, we have new types of tape which are inherently less abrasive, slower operating speeds, and lubricants in the tape which reduce the wear factor to a point where it is of little significance. In addition, surface finishes and more precise contours may soon eliminate the necessity of pressure pads which force the tape against the head and increase wear manifold. With less wear to contend with we are able to get greater efficiency by eliminating the "excess baggage" involved in the deeper gap.

Let us look at the gap during an instant of actual recording. The current is applied to the coil which creates the desired flux in the core pieces. The core pieces conduct this flux to the gap, one side of which is in contact with the moving tape—Figure A.

Most of the flux traverses the gap through the shortest route—directly to the opposite pole piece. Because magnetic lines of force repel each other, those lines near the edge of the gap area tend to bloom out away from the surface. Only these lines are useful to us in recording a tape. Those that travel directly across the gap are a complete waste. However, we must build up this flux density to force the outer lines to bulge into the tape. The flux or power required in the head to record increases with the gap area or depth. It now becomes apparent that we want minimum gap depth or razor edge gaps.

During the playback a different condition exists. The

magnetic field is now generated by the tape and we are detecting them with pole pieces 150 microinches apart. The lines of force thus intercepted find two completely different routes through which they may complete themselves—Figure D. One completely around the core structure through the coil. This route generates current in the coil—produces music in the speaker. The other route, however, is not so desirable. This route is directly across the gap through our 150 microinch gap. The flux that chooses this path bypasses the coil and produces no output. We can lengthen the gap to reduce this but this limits, very rapidly, the frequency response we are after. The only alternative, then, is again to reduce gap depth and thereby reduce area. This forces more of the flux through the coil to become electrical output.

Because the power required to generate a given amount of magnetic flux varies as the square of the distance across the gap, we find it desirable to reduce gap depth to one-fourth when we reduce gap length to one-half. This has been a strong deterrent to extremely narrow gaps until the factors contributing to excessive head wear were eliminated one by one.

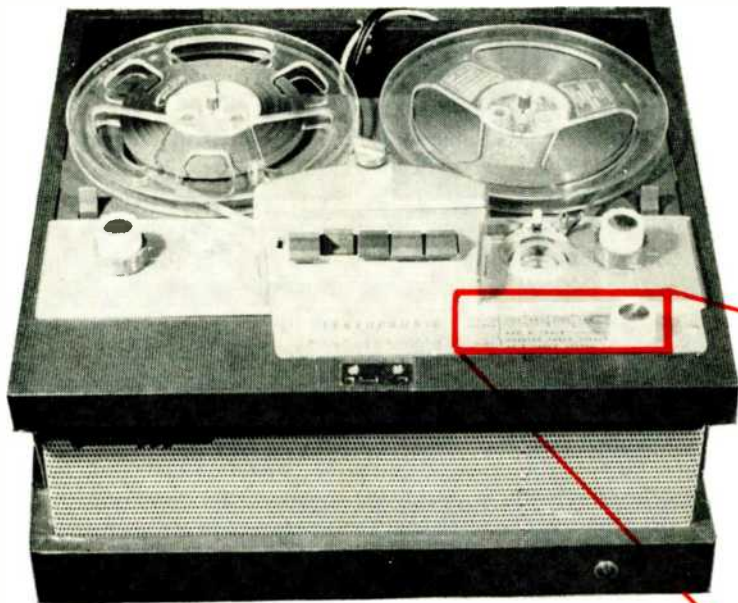
As mentioned earlier, a shallow gap is more difficult to attain in laminated head manufacture. This also works against progress toward miniaturization which is an important aim of head manufacturers. The smaller the head, the less noise it will pick up, therefore, through miniaturization, we look toward the day when heads will be small enough so that they pick up no appreciable noise and all shielding can be eliminated.

Perhaps the history of magnetic recording is still only in its infancy. Tremendous progress has been made in the last sixteen years and we might tend to have the feeling that the technology of the magnetic head has reached its ultimate point.

The truth, however, is that new ideas, new materials, new manufacturing equipment and techniques, and above all new demands by the people who buy and use tape recorders, will likely serve as the basis for new technology which will result in heads that can do more, do it better, in less space and with greater economy than even the finest of today's 4-track stereo units.



Before heads are packed for shipment they are tested on an actual tape deck using a tape loop to provide the signal, the results of which are indicated on the meter.

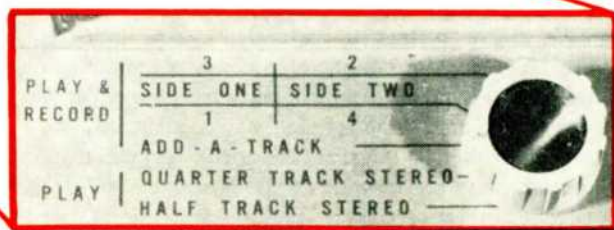


NOW YOU CAN

ADD-A-TRACK

by Bart Pierson

... new V-M 720 opens new possibilities for fun and learning.



MANY years ago, camera tycoon George Eastman designed a simple camera and the slogan "You push the button—we do the rest." With this combination he sold millions of cameras and even today, the simple, inexpensive camera is capable of taking excellent pictures. Many of them just have a one-speed shutter, a knob to wind the film, a lens and the button you push.

But camera fans wanted more. They wanted cameras that were adjustable for distance and light conditions. They were not satisfied with a sure-shot shutter speed; they wanted one they could adjust themselves to stop motion. And the photographic industry obliged by manufacturing them.

These more complex cameras opened new worlds for photographers and resulted in the masterpieces that we see today.

Tape recorders, we are glad to say, are following in the footsteps of the cameras. The first to make the breakthrough to new worlds is V-M with their Model 720, shown in the illustrations.

Basically it will still record and playback just as any other recorder will but through the addition of a second playback head and some ingenious switching, it permits taping variations not possible before on machines in the medium price class.

Would you like to be able to sing a duet with yourself and record it? Would you like to hear how you sound in combination with one of the world's top electronic organ players? Would you like to be able to study, using a recorder that will both ask the questions and check the



The Add-A-Track principle is shown above. The one part, accompaniment or otherwise is recorded on the lower track and picked up by the playback head at right. The new material is recorded on the other track by the top part of the head at left.

answers? All these things, and more, are possible using the new "Add-A-Track" feature.

Let us assume, for the sake of explanation, that you are using a commercially available Add-The-Melody tape. This tape has recorded on the *bottom* track, organ music that is accompaniment only—the melody is missing. This is the part you add by singing or playing an instrument.

The tape is placed on the machine and an external amplifier and speaker are connected to the second channel (the stereo channel). From the external speaker will come the organ music. The speaker in the tape recorder will be silent because nothing is recorded on the top track. This has been left vacant for your use.

Now, if you put the V-M recorder in the Add-A-Track position, any sounds entering the mike will be recorded on the top track, as is normal with all American recorders. But, and it is a big but, when you put the machine in record, *the music will continue to issue from the external speaker.*

You then sing or play into the microphone and your own efforts are recorded on the top track in perfect synchronism with the sound issuing from the speaker.

After you have made your recording, the tape is re-wound and played. This time, your music will come from the recorder speaker and the accompaniment will issue from the external speaker as before. The result is how you sound with organ accompaniment.

So far, so good, and what has been described is possible on some makes of recorders that have monaural record and stereo playback. However, on some models with stacked heads, difficulty was encountered because when the bias and record currents were fed into the top half of the head they interacted with the lower part and cut down the volume of the playback through the external speaker.

V-M, for this reason, has put a second head in the machine that is for playback only. It is this head that picks up the lower track with undiminished volume and makes the Add-A-Track really practical.

But the plus feature on this machine is the fact that,

in addition to commercially available tape, you can make your own Add-A-Track tapes.

At this point we should mention that the lower track, since it is played back only, remains unchanged unless erased or altered. Thus you may use the same background music over and over again, adding new melody lines as you choose.

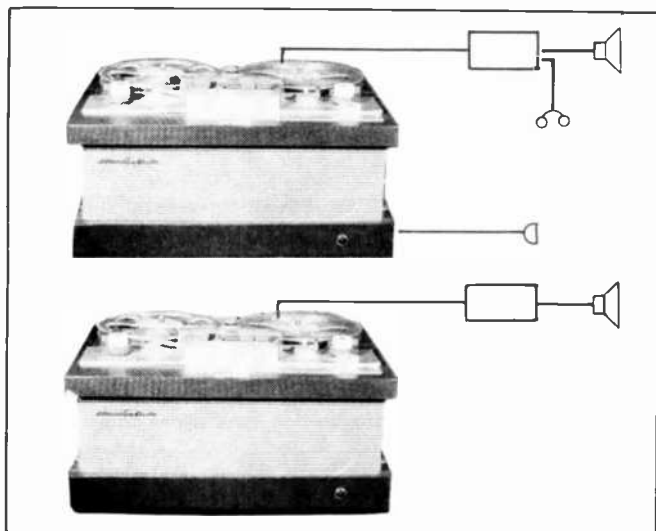
To make your own tape, you turn the selector switch so that the machine is recording on track 2 in one direction, or track 3 if the reel has been flipped. You then record anything you want. For instance a song like "Keep the Home Fires Burning" can be sung and recorded on track 2. Then the tape is rewound and played with the switch in the Add-A-Track position. Your rendition will issue from the external speaker. After you have checked the recording, plug in the mike, put the machine in record and sing "There's a Long, Long, Trail A winding" (be sure it's in the same key!) as the other plays. You'll find the combination interesting.

Or, if you are capable of harmonizing, sing part one with the recorder in track 2 position, switch to the Add-A-Track and, after rewinding the tape to the start, put the machine in record and sing part two into the mike. The playback will have both parts synched together and you will be able to tell exactly how you sound.

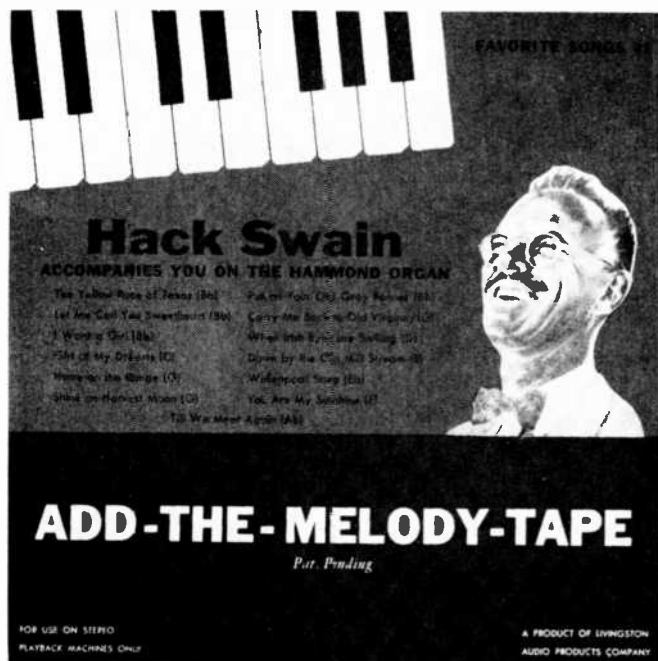
The possibilities for music study are endless using this feature. For instance, if you are scheduled to play a duet with someone, you can record your partner's part and practice with the tape at any time. He could do the same with a recording of your part and you would have the benefit of working together without the other person being physically present.

Let us say you are a singer, or a person who hopes someday to be able to sing with a band, large or small. An orchestra recording in Add-the-Melody can give you the experience of carrying a melody line against an orchestra backing in the privacy of your own home.

Or, if you are a Barbershopper, you can record the other



Top: to record, the microphone is plugged in the jack and the recorder put in record position with the control knob at the Add-A-Track position. Bottom track plays through speaker or headphones as desired. Lower: on playback second track plays through external amplifier and speaker and top track through speaker in recorder.



Add-the-Melody tape of organ music has accompaniment pre-recorded on bottom track of tape. Top track is left blank for use by recordist. It is released by Livingston.

three members of the singing quartet and then practice with the tape between actual sessions.

We found that holding a melody line against accompaniment takes a bit of doing to get it right.

If the members of a string quartet, for instance, each owned a machine, they could record the numbers minus themselves one by one. Then at home, at their own convenience and by means of the recorder, they could practice with the other three.

Now suppose you have some study material to learn. You record the questions, using your textbook as a guide, on track 2. Then rewind the tape and record your answers with the machine in Add-A-Track position. The playback will give you both your questions and answers which you can check against the book to see if you are correct.

Because you can record and play back either channel at will, you can make home tapes where one speaker will argue with the other. Party fun with a recorder such as this takes on new dimensions, too.

When making a recording, the sound heard from the external speaker will also record itself on the track you are recording and, if you stand in front of the speaker, you will have the effect of combining both tracks into one. If you want to keep the two tracks entirely separate, then use a pair of headphones on the second channel so you alone will hear the accompaniment. If the two are separated this way, or the volume kept low on the external speaker when the recording is made, then, through volume adjustment on playback, you can feature either track over the other. If the recordings have been combined on the track you make with the accompaniment, you may find that you were not loud enough, or too loud, and you will have to do it over.

The more you think about this, the more possibilities you can conjure up. We think V-M is wise in incorporating this Add-A-Track feature in their machine. In addition this machine will play full track, dual track, four track stacked or staggered stereo!

DIRECTORY OF 4-TRACK EQUIPMENT

Compiled and Edited by Jean Cover

Specifications, features and price information contained herein were obtained from the manufacturers and are correct as of date of publication.

RECORDERS



AMERICAN ELECTRONICS, INC., Concertone Division—Concertone 505. Two-channel stereo-monaural half track recorder; a flip of the channel selector switch and you have a single channel recorder. Multiple track recordings are easily made. Plays 2-track and 4-track tapes, either $7\frac{1}{2}$ or $3\frac{3}{4}$ ips. Feather touch push-button relay operation; 3 motors, including hysteresis drive; frequency response 40-12,000 cps, plus or minus 3 db at faster speed. 40-17,000 cps on four track playback; flutter and wow less than .25% RMS at $7\frac{1}{2}$ ips; signal-to-noise 50 db at $7\frac{1}{2}$ ips. Price: \$495 (less carrying case).

Model Mark VII-F records two track stereo and monaural; plays back two track stereo, four track stereo and monaural. Direct drive capstan motor, four pole induction type reeling motors; easy, automatic electric pushbutton controls, solenoid operated; 15 and $7\frac{1}{2}$ ips or $7\frac{1}{2}$ and $3\frac{3}{4}$ ips; frequency response 50-15,000 cps plus or minus 2 db at 15 ips; flutter and wow less than 0.25% at $7\frac{1}{2}$ ips; signal-to-noise ratio 50 db. Price: \$995 (with carrying case \$1050).

Model 33F, equipped with two stereo playback heads, a 2 channel, half track stereo playback and a 2 channel, quarter track stereo playback head. Speeds of $7\frac{1}{2}$ and 15 ips or $7\frac{1}{2}$ and $3\frac{3}{4}$ ips; hysteresis synchronous direct-drive capstan motor; separate record-playback preamplifiers for each channel; frequency response 40 to 15,000 cps at 15 ips plus or minus 2 db; flutter and wow 0.1% RMS (or less) at 15 ips. Price: \$1060.

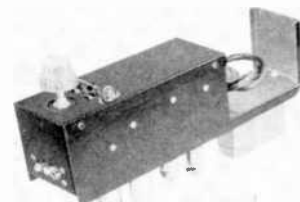
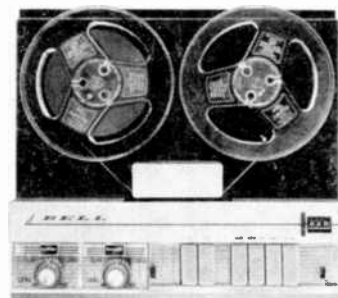
AMPEX AUDIO INC. 900 Series units now have facilities for playing 4-track stereo tapes. The 960 (above) records stereo and half-track; plays back 2-track stereo and 4-track stereo, half-track and full track. Speeds of $3\frac{3}{4}$ and $7\frac{1}{2}$ ips; heads have 90 millionths of an inch gap and are precision lapped to optical flatness; automatic shutoff; V.U. meter; frequency response from 30 to 20,000 cps at $7\frac{1}{2}$ ips, and from 30 to 15,000 cps at $3\frac{3}{4}$ ips; high impedance line inputs (radio/TV/phono/auxiliary) 0.3V rms for program level, high impedance microphone inputs; approximately 0.5V rms from cathode follower when playing program level tapes; flutter and wow under 0.2% rms at $7\frac{1}{2}$ ips.

Model 2560 is a portable stereo system consisting of a 960 recorder and pair of 2010 amplifier-speakers. The 2010's amplifier section provides operating characteristics flat within plus or minus 0.1 db, with total harmonic distortion less than 0.5 of 1%. The 8" speaker provides smooth, peak-free response throughout a remarkably wide audio range; it has a die-cast frame and edgewise-wound ribbon coil. Price: \$650.



BELL SOUND DIVISION, Thompson Ramo Wooldridge Inc. stereo tape transport, $\frac{1}{2}$ track or $\frac{1}{4}$ track stereo recordings. As just transport (top) can be connected to amplifier for stereo playback; Model T-223 has $\frac{1}{2}$ track stereo erase/record-playback, $\frac{1}{4}$ track stereo playback. With addition of two matching RP-120 record-playback preamplifiers (middle) half-track or quarter-track stereo recordings are also possible. Complete recording package models are also available (bottom). Model T-238 has monaural and $\frac{1}{4}$ track stereo erase/record-playback; $\frac{1}{2}$ track stereo playback. Three heavy-duty 4 pole motors; speeds of $3\frac{3}{4}$ and $7\frac{1}{2}$ ips; wow and

flutter less than 0.2% at faster speed; auto-stop mechanism. When used with RP-120 preamps, frequency response is 25-12,000 cps, plus or minus 2 db, an-1 signal-to-noise



ratio is better than 50 db at peak record signal.

The record-playback preamplifier has two inputs for microphone, tuner, etc.; a Cathode follower output is provided. Recording heads on the Bell tape transport are perfectly matched to perform best with Bell Add-On preamplifiers. Prices: Contact manufacturer.

EKOTAPE, Webster Electric Model 300. Tape Deck: Inline quarter-track recording and playback, dual erase. Three controls:



350 Stereophon

manual start/stop; wow and flutter 0.2% max. at 7½ ips, 0.3% max. at 3¾ ips; automatic stop; two recording and playback level indicators. Preamplifier: Volume control, tone control, record/playback switch and speed compensation switch for each channel, erase switch and On/Off switch; two recording and playback level indicators; six inputs; four outputs; signal-to-noise ratio 45 db; frequency response 30 to 15,000 cps.

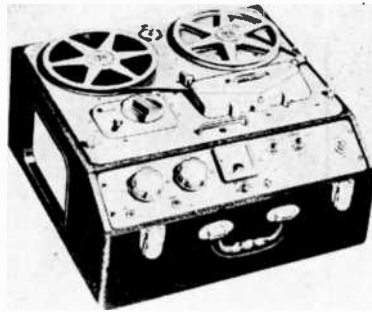
Power Amplifiers: One high impedance input; less than 1% harmonic distortion at 12 watts; less than 1% intermodulation distortion at 12 watts; negative feedback 20 db.

Speakers: one watt of electrical energy input to the speaker system produces a mean sound level of 92 db at one meter distance from cone axis; 10 watts continuous with 20 watt peaks on all programming of complex wave form. Each speaker cabinet in the "Stereo-Suite" series (300W—300F—top) contains one 3" and one 8" speaker with crossover network.

Models 360 and 362 tape decks are capable of playing and recording monaural and stereo two-channel and four-channel, and can be mounted either vertically or horizontally. Controls consist of just two knobs and a selector switch, central control for tape direction, speed selector (3¾ and 7½ ips), and channel selector. 362 differs from 360 in that it has a built-in automatic stop as well as a program selection finder.

Model 350 (bottom) can play back four and two track tapes as well as its ability to record and playback monaurally. It has speeds of 3¾ and 7½ ips; two complete amplifiers; frequency response 30 to 15,000 cps; signal-to-noise ratio 43 db; wow and flutter 0.2% maximum at 7½ ips; automatic stop; record level indicator.

ERCONA CORPORATION Ferrograph 808/4. Complete stereo recording and playback facilities, as well as monophonic. Quarter-track machine, 3¾-7½ ips. Will accommodate up to 8¼" reels. Flat frequency response, plus or minus 2 db, 50-10,000 cps/7½ ips and 50-8,000 cps/3¾ ips; signal-to-noise better than 50 db, 200-



12,000 cps; 45 db unweighted including hum; wow and flutter less than .2% at 7½ ips; three motors including one hysteresis synchronous drive motor for driving capstan; recording level VU meter; auto-switch cutoff and azimuth head adjustment for heads. Each pair of tracks served by dual inputs of .003 volt peak (min.) and 0.1 volt peak (min.). Matched low-level outputs to feed present high fidelity amplifier system. Price: \$595.



HEATHKIT Model TR-1AQ quarter-track monaural and stereo with record/playback, fast forward and rewind functions. Frequency response 40-15,000 cps, plus or minus 3 db at 7½ ips, 40-10,000 cps at 3¾ ips; signal-to-noise ratio 40 db below full output of .75 volts/channel; harmonic distortion less than 2% at full output; bias erase 60 kc (push-pull oscillator); flutter and wow less than 0.35%; four-pole, fan cooled induction motor; Magic-Eye level indicator; safety interlock. These decks may be mounted in either a vertical or horizontal position. Price: \$149.95.



HOSHO OF AMERICA, INC. Model 707C, records stereo on 2-tracks or monaural on dual track, plays back stereo on 2 or 4 tracks. Has 3 precision multi-shielded magnetic heads, one for half-track erasing, one for half-track recording and playback, and one for quarter-track playback; synchronous hysteresis motor; self contained advanced designed stereo preamplifier and power amplifier; built-in high fidelity stereo speakers; built-in outputs for the 707-S extension stereo speaker system; V.U. meters; speeds of 3¾ and 7½ ips; wow and flutter less than 0.2% at 7½ ips; better than 55 db crosstalk rejection; 30-15,000 cps frequency response at the faster speed; signal-to-noise ratio more than 50 db per each channel; total harmonic distortion 3% maximum at normal recording level. Price: \$349.50.



INTERNATIONAL RADIO AND ELECTRONICS CORP. has over 20 recorders with four-track facilities which are made up of various components.

Head Assemblies: Six different quarter-track record, playback, and combination head assemblies such as: CSH, records and plays quarter-track inline stereo; C4TSH, plays quarter-track stereo; RP4P2, records and plays quarter-track stereo and plays two-track stereo. Frequency response 50-28,000 cps plus or minus 2 db at 15 ips, 40-17,000 cps plus or minus 2 db at 7½ ips; signal-to-noise ratio 56 db at 15 ips, 53 db at 7½ ips; below 3% harmonic distortion. All 19" rack mount panels; satin silver aluminum anodized front panels; satin gold aluminum anodized sub-chassis; mechanical, visual and electrical record locks.

GCT Transport: 3 speeds—15, $7\frac{1}{2}$ and $3\frac{3}{4}$ ips; differential magnetic brakes; magnetic payoff; 2 position magnetic torque takeup; $10\frac{1}{2}$ " reels; fast forward and rewind; maximum flutter and wow 0.06% at 15 ips, 0.09% at $7\frac{1}{2}$ ips; high torque synchronous motor. Price: \$190.

RPA Record-Play Amplifier: 2 mike inputs; bass and treble boost; recording bias check; 3 speed record-play equalization; DC filaments; 3" V.U. meter; response plus or minus $\frac{1}{2}$ db 20-30,000 cps; less than 0.2% distortion for 1 V output. Hum and noise: 60 db below -55 db input on mike channel and 75 db below -20 db input on phono channel. Price: \$190.

Some of the machines available are as follows:

Gold Crown Stereo Player—portable, plays back quarter-track stereo. Components: transport, stereo player preamp, head assembly. Price: \$327; \$52 for carrying case.

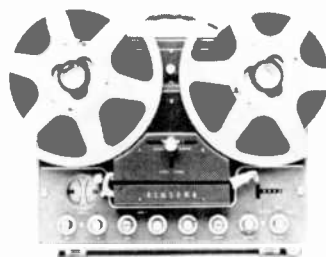
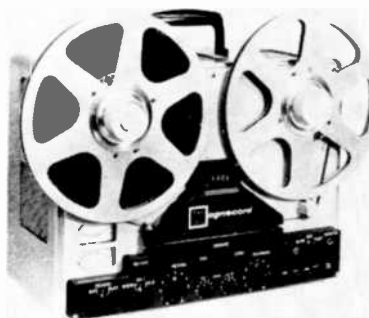
Gold Crown Prince—portable, monaural recorder with quarter-track playback. Components: transport, one record play pre-amplifier, playback preamplifier, head assembly. Price: \$500; \$52 for carrying case.

Gold Crown Imperial—portable, monaural recorder with quarter-track playback. Components: transport, one record play pre-amplifier, head assembly, monaural 15 watt amplifier. Price: \$575, \$52 for carrying case.

Gold Crown Stereo X (top)—portable, stereo and monaural recorder and player. Components: transport, two record play preamplifiers, head assembly. Prices: \$695, record and play quarter-track stereo; \$715, record and play two track stereo or play quarter-track stereo; \$715, record and play quarter-track stereo or play two-track stereo; \$59 for carrying case.

Gold Crown Royal (bottom)—stereo and monaural recorder and player. Components: transport, two record play pre-amplifiers, head assembly, double 30 watt power amplifier. Prices: \$385, record and play quarter-track stereo; \$905, record and play two-track stereo or play quarter-track stereo; \$905, record and play quarter-track stereo or play two-track stereo; \$75 for carrying case.

MAGNECORD, Division of Midwestern Instruments, Inc., Model 728 (top) has split stereo erase head, two track stereo record head, two track stereo reproduce head, with provision in the head mounting bracket for the addition of a fourth head. The fourth head is ordinarily used to reproduce quarter track stereo tapes. It is not required for sound-on-sound. A fourth head may be a half or full track monaural head or a special purpose head. Sound-on-sound recording; hysteresis synchronous motor; speeds of either $7\frac{1}{2}$ and 15 ips or $3\frac{3}{4}$ and $7\frac{1}{2}$ ips; two illuminated V.U. meters, one for each channel; frequency response 30-18,000 cps plus or minus 2 db at 15 ips; signal-to-noise ratio better than 55 db per channel; flutter and wow 0.1% at 15 ips. Rack mounting or portable mounting is optional. Price: Contact manufacturer.

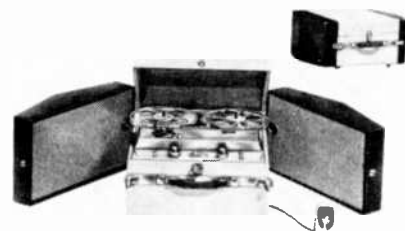
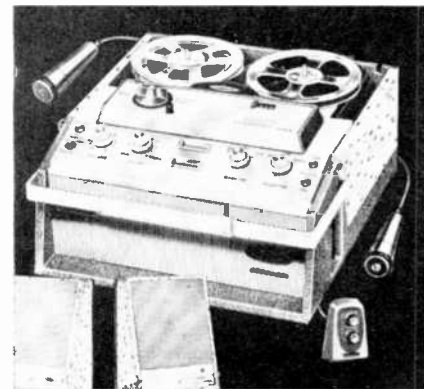
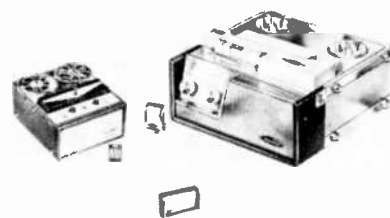


NEWCOMB SM-310 records and plays back tape monaurally or stereophonically; can be ordered as a $\frac{1}{4}$ track stereo or $\frac{1}{2}$ track machine as desired. Operates vertically or horizontally; has speeds of $3\frac{3}{4}$ and $7\frac{1}{2}$ ips; single motor is fully synchronous, cool running, precision built; separate mixing controls—mike and line—for each channel; two lighted recording level meters; automatic shut-off switch; all preamplification needed for recording and playback; flutter less than .2% at $7\frac{1}{2}$ ips; signal-to-noise ratio better than 50 db; and frequency response plus or minus 2 db 30 to 15,000 cps at faster speed; 4 input, 3 output jacks. Price: Contact manufacturer.

NORFLCO (North American Philips Co.) Continental "400" (Model EL3536), 4 track stereo record and playback tape re-



cor. Speeds of 178, $3\frac{3}{4}$ and $7\frac{1}{2}$ ips; inputs for recording from microphone, tuners and phono, with facilities for mixing mike with tuners or phono; and an output jack for monitoring with stereo headphones. Frequency response is 50-18,000 cps at the fast speed; signal-to-noise ratio is better than 55 db; and wow and flutter is 0.15% at the fast speed. Magic Eye modulation indicator; pause button with locking device; automatic stop; fast wind and rewind. Price: \$399.50.



PENTRON CORP. Concerto TR-10S (top, left) monaural record/playback and 2 and 4 track playback. "Unimagic" single lever control; automatic self-energizing braking, safety interlock record button; speeds of $3\frac{3}{4}$ and $7\frac{1}{2}$ ips; 40-7,000 cps at $3\frac{3}{4}$ ips; signal-to-noise ratio 45 db; 2 input, 2 output jacks. Matching amplifier/speaker in portable cabinet available. Price: \$159.95. Triumph (top, right) XP-60S compact,

monaural record playback, plays 4 track or 2 track tapes. Dual preamp permits playing second stereo channel through available companion unit. Push button operation; one 4 x 6 oval speaker and one 4" PM speaker; Magic-Eye indicator; speeds of 3 $\frac{3}{4}$ and 7 $\frac{1}{2}$ ips; instant automatic "Sure Lok" brakes; automatic shut-off; two input, two output jacks; frequency response 40-15,000 cps plus or minus 3 db at faster speed; signal-to-noise ratio 52 db; flutter under 0.3% at 7 $\frac{1}{2}$ ips. Price: \$249.95.

Emperor II (middle) NL-4—monaural record/play, 4-track and 2-track stereo record/play. Dual pole erase head; frequency response 40-15,000 cps at faster speed; four inputs, four outputs; Finger Flite single rotary control for Play, Record, Fast Forward, Fast Rewind, safety interlock button; two volume controls; signal-to-noise ratio 50 db; one channel or dual mixing public address system. Price: \$500.

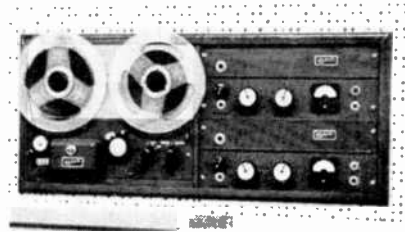
Aristocrat II TR20 (bottom)—portable, monaural record/play, 2 or 4 track stereo playback. Includes two separate stereo speaker/amplifiers attached to main unit; speakers can be detached. Speeds of 3 $\frac{3}{4}$ and 7 $\frac{1}{2}$ ips; V.U. Meter; signal-to-noise ratio —52 db; 2 inputs, 4 outputs; may be used as public address system; automatic shut-off, instant automatic braking. Price: \$350.



RECORDIO: Model R-692 (top)—Plays one half track stereo, one quarter track stereo, monaural tapes, and records monaurally without changing the one quarter track stereo head. Dual microphone phono-radio-TV inputs; dual external speaker outputs; V.U. meters; speeds of 3 $\frac{3}{4}$ and 7 $\frac{1}{2}$ ips, separately equalized for best response at each speed; frequency response 40 to 12,000 cps at faster speed equalized to N.A.R.T.B. standard curve; two 5 x 7

oval extended range speakers, internal; wow and flutter .3% at faster speed; A.C. erase; and warning light to prevent accidental erase of second track when recording monaural.

Model R-693 (bottom)—completely self contained quarter-track stereophonic record, stereophonic playback recorder.



ROBERTS ELECTRONICS INC. 190-D-4 tape deck (top). Equipped with either four track or two track stereo record/play heads. "Multi-Rase" head provides half track erase during monaural recording and two track erase during stereo recording; hysteresis synchronous motor; pause lever for easy editing; index counter; interlocked fail-free controls. Price: \$199.50.

Model 90C system—four track stereo record/playback, plus A-901 amplifier. Price: \$509.

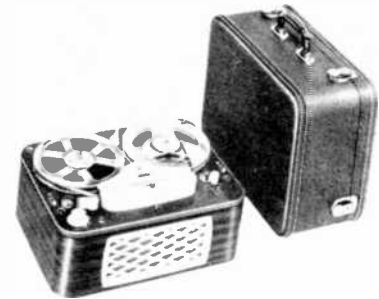
Model 90-C-4 (bottom)—four track record/playback. Price: \$359.50.

Both the 90-C and 90-C-4 contain the following features: self-contained record-playback system; multi-rase head; calibrated V.U. meter; hysteresis synchronous motor; speeds of 3 $\frac{3}{4}$ -7 $\frac{1}{2}$ ips; frequency response 40-15,000 cps at 7 $\frac{1}{2}$, plus or minus 2 db; signal to noise ratio 50 db; wow and flutter less than 0.18% RMS; interlocking controls; pause lever.

SUPERSCOPE, INC., Audio Electronics Division, Model DK-555-A4, monaural and stereo record and playback, with additional 1, track playback head for 4-track stereo tapes. Built-in stereo recording amplifiers, stereo preamplifiers and stereo power amplifiers; speeds of 3 $\frac{3}{4}$ and 7 $\frac{1}{2}$ ips; hysteresis synchronous drive motor; two professional V.U. meters; separate level and tone control for each channel; instantaneous stop lever; dynamically balanced flywheel. frequency response 30-18,000 cps at faster



speed; signal-to-noise ratio 50 db or more across line output; flutter and wow less than 0.2% at 7 $\frac{1}{2}$ ips. Price: \$470.



TANDBERG: Model 4 (top)—Records four monaural channels separately, plays any stereo or monaural tapes, erases any channel selectivity. Speeds of 1 $\frac{7}{8}$, 3 $\frac{3}{4}$ and 7 $\frac{1}{2}$ ips; frequency response 30-16,000 cps at highest speed; wow and flutter .1% at 7 $\frac{1}{2}$; signal-to-noise ratio —55 db at 7 $\frac{1}{2}$ ips; 5 $\frac{1}{2}$ " x 8" Goodman speaker built-in; automatic stop. Price: \$349.50.

Model 4F—Same as 4 except also includes remote operation foot pedal. Price: \$399.50.

Model 5—Records 4 individual monaural tracks, plays back half track and quarter track monaural, two track stereo, and four track stereo, has 4-track erase. Speeds of 1 $\frac{7}{8}$, 3 $\frac{3}{4}$, and 7 $\frac{1}{2}$ ips; single lever control; clock counter; automatic shut-off; dual recording level indicators; built-in monitor speaker; 2-power playback amplifiers; cathode follower output switch; equalization switch. Signal-to-noise ratio 60 db, power output 8 watts peak from each amplifier, and distortion below 1%. Price: \$419.50.

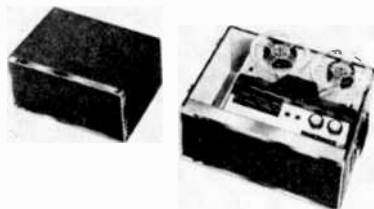
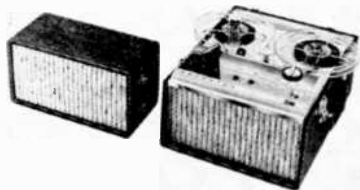
Model 5-1—Same as Model 5 but includes a hand-luggage transport case. Price: \$442.50.

Model 5-2 (bottom)—Also records stereophonically. Tape drive unit; one re-

recording amplifier; two matched stereo playback amplifiers mounted in a slim-line hand-rubbed mahogany cabinet. Second recording amplifier is mounted in an auxiliary mini-cabinet. Complete with two mikes, input-output cords, supply and takeup reels, and transport luggage case. Price: \$514.50.

Model 5-3—Same as 5-2, except less luggage case. Price: \$493.50.

Model 5-2-266—Same as 5-2, but also includes two matched bookshelf speaker systems. Price: \$638.50.



TELELECTROSONIC CORP. Model 1975 (top), monaural dual-track recording and stereo (2 track or 4 track) or monaural playback. A preamplifier is provided for channel 2. 1—5" woofer, 1—4" tweeter, electrical crossover for 2-way high fidelity; speeds of $3\frac{3}{4}$ and $7\frac{1}{2}$ ips; frequency response 100-12,000 cps at faster speed; wow and flutter less than 0.3% at faster speed; signal-to-noise ratio 40 db. Price: \$119.95.

Model 400 (bottom)—portable, will record and play 4-track or 2-track stereo and dual-track monaural tapes. Two complete 8 watt amplifier channels; 2-way high fidelity speaker system; 178, $3\frac{3}{4}$ and $7\frac{1}{2}$ ips speeds; the second channel requires only the plug-in addition of a speaker. Frequency response 50-15,000 cps plus or minus 2 db at fastest speed; 1—6" woofer, 1—3" tweeter; wow and flutter less than 0.25% at $7\frac{1}{2}$ ips; signal-to-noise ratio 45 db; individual channel volume and tone controls; automatic shutoff. Price: \$289.95.

Model 360—Same as 400 except stereo playback only plus monaural record and play. Preamplifier only for second channel. Price: \$179.95.

Model 333—Same as 400 except stereo playback only, plus monaural record and play. Price: \$219.95.



VIKING Series 85 deck (above) Model 85RQ is equipped with monaural erase and record/play heads and inline quarter-

track stereo head. Model 85ESQ is equipped with inline half-track erase and record/play heads. Same as 85ES except quarter-track stereo heads included for playback of four track tapes. Quarter-track heads may also be used for recording, for playback of half-track tapes, and monitoring during recording. Two motors; speeds of $3\frac{3}{4}$ and $7\frac{1}{2}$ ips; dual rotary tape motion controls; interlock; universal head mounting bracket on all models permits changing or adding to head complement using standard Viking heads and mounting hardware; frequency response 30-14,000 cps plus or minus 3 db; signal-to-noise better than 55 db; flutter less than .2% at $7\frac{1}{2}$ ips; distortion less than 1%. All units equipped with head bracket shift to permit use of quarter-track heads for playing both half-track and quarter-track tapes. Use with Viking record/playback amplifiers for recording and playback. Use with any NAB tape equalized amplifier for playback only. Prices: 85RQ—\$147.50; 85ESQ—\$172.

95 Series—heavy-duty transport designed for commercial, broadcast and critical recording applications. Designed for conventional relay rack mounting and may be used with one, two, or any combination of suitable recording and playback amplifiers for commonly used single channel or dual channel recording and playback applications. Triple belt drive from hysteresis synchronous motor for extremely low flutter and wow; induction rewind and takeup motors; accepts 10½ inch reels and all smaller without adapters; photo-electric tape runout shutoff; solenoid operated fail-safe brake; connectors provided for remote control; flutter and wow less than 0.1 percent at 15 ips, less than 0.15 percent at $7\frac{1}{2}$ ips, less than 0.25 percent at $3\frac{3}{4}$ ips; signal to noise ratio 55 db; frequency response 30 to 14,000 cps at $7\frac{1}{2}$ ips; speeds of $7\frac{1}{2}$ and 15 ips, or $7\frac{1}{2}$ and $3\frac{3}{4}$ ips. Model 95ESQ is equipped for half-track laminated inline erase and record/play and inline quarter-track play. Price: \$546.50.

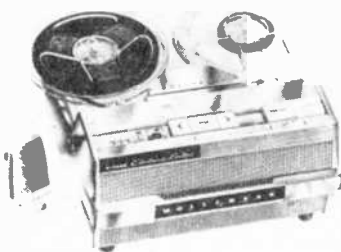


V-M TAPE-O-MATIC, Model 720 quarter track, half track, record/play, plus Add-A-Track, for adding your voice or instrumental accompaniment to a recorded tape. Push-button controls; tape index timer; frequency response 40-15,000 cps plus or minus 5 db; Cathoptic tuning eye and automatic shut-off; monitor switch; pause button; safety lock switch; wow and flutter less than .4% RMS; a 9" oval and 3.5" tweeter speaker; signal-to-noise ratio better than -45 db. A matching Model 166 amplifier-speaker is available. Price: \$225.



WEBCOR Regent Coronet, Model EP-2007 (top). Records stereo and monaural tapes—has two or four track stereo playback. Three speeds (178, $3\frac{3}{4}$, $7\frac{1}{2}$); frequency response 50-15,000 cps at fastest speed; has 16 watt dual-channel amplifier, 8 watts per channel; wow and flutter less than .4% at $7\frac{1}{2}$ and $3\frac{3}{4}$ ips; signal-to-noise ratio 45 db; two wide range speakers, one for each channel; 2 track and 4 track head adjustment switch; two volume controls, one for each channel; V.U. meter; tape counter; comes with two hand held, special stereo record microphones with ceramic element. Price: \$319.

Royalite, Model EP-2008 (bottom). Two or four track stereophonic playback, monaural record and playback. Three speeds (178, $3\frac{3}{4}$, $7\frac{1}{2}$); frequency response 50-12,000 cps; dual channel, 16 watt amplifier; automatic shut-off; wow and flutter less than .4% at $7\frac{1}{2}$ ips; signal-to-noise ratio 45 db; two "elliptical" speakers; Cathode Ray recording level indicator; monitor control; tape counter; 4 pole, 4 coil heavy duty motor; fast forward and rewind; case made of durable, scuff proof Royalite. Price: \$239.95.



WOLLENSAK T-1616—monaural and stereo record and play—can record four separate tracks. Built-in preamp; range of 40-16,000 cps; simplified drop-in loading;

dual speeds of $3\frac{3}{4}$ and $7\frac{1}{2}$ ips; 2-level record indicators; index counter. Price: \$279.50.

Wollensak 1500 and 1600 machines can be converted to two or four track stereo by using the Nortronic head kits. See Heads section.

CARTRIDGE MACHINES



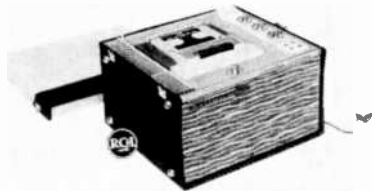
BELL SOUND DIVISION, Thompson Ramo Wooldridge Inc. Stereo-Pak tape cartridge player and recorder. Speed $3\frac{3}{4}$ ips; auto stop switch also turns off whole system; master monitor control enables you to monitor recordings through your speaker system; magic VU meters; transistor record-playback preamplifiers; flutter less than 0.25% RMS; frequency response 30-15,000 cps.

The Overture series of the Stereo-Pak (models 401, 402 and 403—top) can easily become part of an existing system, connecting directly to a stereo amplifier, or TV set and radio.

The Maestro group (models 404 and

405—middle) are custom-styled furniture table models in walnut. Built-in stereo amplifiers make these models ready to play through a speaker system.

The Play-Mate (model 406—bottom) is a completely portable version of the Stereo-Pak, decked out in a smart-looking scuff-proof carrying case. Prices: 401—\$99.95; 402—\$129.95; 403—\$199.95; 404—\$229.95; 405—\$299.95; 406—\$299.95.



RCA Model SCP2 (top), magazine-loading tape recorder—both stereo and monaural playback and recording. Easy to operate. Up to two hours of music on each tape cartridge; two in one amplifier with a transistorized preamplifier; precision-play 4-track transport plays two sound tracks at $3\frac{3}{4}$ ips without any threading or rewinding; push-button controls (starting, stopping, fast forward and fast reverse); master control panel includes a pull-push on-off dual loudness control, a dual tone control, and a switch for selecting Track I or II, stereo, or use as an auxiliary speaker system; built-in 3 speaker sound system (a $6\frac{1}{2}$ " or 8" woofer and two $3\frac{1}{2}$ " tweeters); 50 to 15,000 cps.

Model SCP3 (bottom) is similar to SCP2 except it also has a fully automatic stereo tape transport which plays all four sound tracks automatically. You need not turn the cartridge over.

Prices: Contact manufacturer.

CARTRIDGE ADAPTER



ROBERTS ELECTRONICS INC. adapter mechanism, easily attached to any Roberts recorder for playback of RCA type cartridge tapes. Mounted directly over feed reel and takeup reel spindles; is driven by a belt connection from the recorder capstan to a flywheel beneath the adapter. Price: \$75.

CONVERSION KITS

AMERICAN ELECTRONICS conversion kit #550 four track stereo playback. Includes Concertone #106438 4 track stereo playback head, 1 set of cables, 1 switch and instructions. Converts Models BR-BRX—Concertone 20/20—Series 20, and Series 30. Price: \$65.



AMPEX AUDIO INC. has a 4-track conversion kit available for its "A" series stereo playback recorders. Because conversion includes installation of the Ampex 90-millionths magnetic-gap playback head, an improvement in frequency response from 2-track tapes is also obtained, as well as increased frequency response from the $3\frac{3}{4}$ speed. Price: \$50, including installation by an Authorized Ampex Service Center.

BELL—4-track conversion kit BTK-200 for Bell models T-201, T-202, T-203. Price: \$25. BTK-210 for Bell models T-211, T-212, T-213. Price: \$27.50. Easy to install yourself, fits on regular head bracket of Bell tape transport, complete instructions provided, special gauge included for precise head alignment.

HEATH COMPANY MK-5 quarter-track stereo conversion kit modifies their TR-1A monaural tape recorder to include function of record and playback of quarter-track stereo. Consists of a TE-1 tape preamplifier, a stereo head array plus components and instructions. Price: \$62.95.

MAGNECORD, Division of Midwestern Instruments, Inc. will shortly have available a conversion kit for their series 100 Magnecordette stereo recorder. It will allow the user to both record and reproduce quarter-track stereo tapes. New heads are simply plugged into recorder. Price: \$65.

ROBERTS has available a stereo head assembly (90-52-78) for four-track. Price: \$56.

SUPERSCOPE four-track conversion on all Sony stereo recorder models is done by factory modification at the company's Sun Valley, Calif. plant. Price: \$75 including freight to and from factory.

TANDBERG Model STK-4529 stereo playback conversion kit. Can be used with Models 3B and 3BF. Allows playback of four track monaural tapes and two-way stereo tapes. Consists of Tandberg stereo playback preamplifier and #529 4-track head, plus installation instructions and wiring diagram. Price: \$62.50.

Model #529 stereo 4-track record-playback heads. To replace the stereo head in present Model 3-stereo. Permits playback of 4-track stereo tapes. Price: \$49.50.

VIKING—Conversion kits with 4-track heads available. Price: \$27 (depending on models to be converted). This does not include installation.

V-M k-85 4 channel stereo conversion kit. Available for all V-M 714's. Comes complete with full easy-to-follow instructions; kit can be installed by any competent serviceman; installation charges are estimated to be from \$7.50 to \$10.00. Price: \$25.00.

WOLLENSAK—Nortronics has available the WR-40 monaural record stereo playback head kit and the WR-45 stereo record and playback head kit. Prices: Contact manufacturer.

HEADS



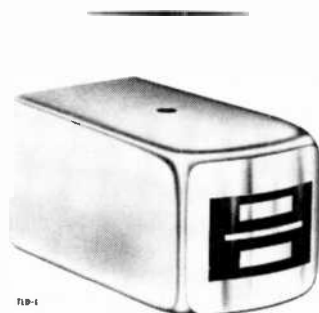
MICHIGAN MAGNETICS "Q" Line. 5Q17 stereo head is exclusively designed for performance at 3¾ ips, ¼ track approaching performance at 7½ ips, ½ track;

greater hum rejection because of flush shield construction; track width and separation comply with all industry standards; crosstalk figure of merit 50 db or better; colinearity and straightness of gaps within 5 millionths of an inch; impedance 1000 cycles—3340 ohms; record level—12 db below sat.; bias frequency 80 KC.

"B" Line. 7B17 stereo head. Has hooded mumetal shield for the best hum rejection; hyperbolic face contour insures intimate tape contact with lowest pressure and wear; gap length 170 microinches; track width and separation comply with all industry standards; crosstalk figure of merit 50 db or better; colinearity and straightness of gaps within 5 millionths of an inch; impedance 100 cycles—5150 ohms; record level—12 db below sat.; bias frequency 80 KC.

9QE3 quarter-track erase head. Erase frequency 75 KC; erase current 12.5 MA; erasure from saturated tape—60 db; nom. inductance 9.0 MHys.

Contact manufacturer for additional details and prices.



TLD-L



TLD-M

Magneto Style Laminated Core Quarter-Track R/P Stereo Head

NORTRONICS TLD-L (top) is a record/playback head for quarter-track stereo and four-channel monaural applications. Laminated core construction; gap spacer is 80 to 100 micro-inches in thickness; frequency response to 15,000 cps at 3¾ ips, to 20,000 cps at 7½ ips; the high output signal from the head is ample for most tape head amplifiers; a heavy one-piece magnetic-shield case is used for protection against external hum fields; the flush-ground and polished face is free from

oxide buildup and has snag-proof tape access.

TLD-M (bottom) head is similar to TLD-L, except it is particularly qualified for machines using the new magazine system. The sloped design of the face of the head smoothly controls the tape entry during loading of the magazine.

TLB-2 quarter-track stereo record/play head, 0.9 Henry inductance, laminated cores. D.C. resistance 460 ohms; inductance, 1 KC-900 MHY.; bias frequency 40 to 80 KC; record level 12 db below sat. Gap spacer 80-100 micro-inches; track width 0.043 inches; crosstalk rejection 50 to 60 db.

SE-50 stacked stereo erase head for quarter-track recording applications. Either erase channel may be operated independently of the other for monaural recording. Double-gap and laminated-core; face is of polished metal; two pairs of pin terminals are provided at the rear of the head for convenient connections; three mounting styles are base mount, side mount, and rear mount. The SE-50M is a cartridge style erase head designed for use in combination with the record head on the cartridge tape recorders. Prices: Contact manufacturer.



ROBINS INDUSTRIES CORP. has available a new ¼ track stereo record/playback head (5Q8) and a ¼ track erase head (9QE3) for conversions.

Recording head: "Golden gap" of 0.00008 inches wide; flush shield construction for greatest hum rejection; crosstalk figure of merit is—50 db or better; colinearity and straightness of gap is within 5 millionths of an inch. Price: \$30.

Erase head: Easily replace heads in many tape recorders now in use with only slight mechanical and electrical modification. Erase frequency 75 kc; erase current 12.5 ma; erasure from saturated tape—60 db; 2500 ohms impedance at 75 kc; inductance 9 mh; D-C resistance 33 ohms. Price: \$14.

RECORDED TAPE COMPANIES

THE list below shows the present availability of tapes. Catalogs of selections available may be obtained from dealers or from the individual companies. Two and four-track tapes are on reels. Cartridges are four-track. See Manufacturers and Distributors list for addresses.

Audio Fidelity: 2-track; 4-track
Bel Canto: 2-track; 4-track; cartridges
Columbia: 2-track
Contemporary: 2-track

Concertapes: 2-track; 4-track
Cook: 2-track
Dot: 4-track
Dyna: 2-track
Elektra: 4-track
Everest: 4-track
Fantasy: 2-track
Grand Award: 2-track
Hifitape: 2-track; 4-track
Kandy: 2-track
Kapp: 4-track

Liberty: 2-track; 4-track; cartridges
Livingston: 2-track; 4 track
Mercury: 2-track; 4-track; cartridges
MGM: 4-track
Montilla: 2-track
Music Therapy: 2-track
Omegatape: 2-track; 4-track; cartridges
RCA: 2-track; cartridges
Roulette: 4-track
Sonotape (Westminster): 2-track; 4-track; cartridges

Stereotape: 2-track; 4-track
 Stereophonic Music Society: 4-track; cartridges
 Vanguard: 4-track
 Verve: 4-track
 Vox: 2-track; 4-track
 Warner Bros.: 4-track
 WFB: 2-track
 World Pacific: 4-track

You are advised to contact your local dealer and have him order tapes for you. The list below is presented in the event your local dealer does not know where he can obtain these tapes for you.

DEALER SOURCES FOR TAPES
 The following companies sell directly or through regular distribution channels:

Audio Fidelity	Kandy
Bel Canto	Liberty
Columbia	Livingston
Concertapes	Mercury
Contemporary	Montilla
Cook	Music Therapy
Dyna	Omegatape
Everest	RCA
Fantasy	Sonotape
Grand Award	Stereotape
Hifitape	SMS

WFB
 National distributing services for dealers:
 STEREO TAPE ONE-STOP—2-track; 4-track; cartridges
 Labels: All companies
 UNITED STEREO TAPES—4-track only
 Labels: Audio Fidelity, Bel Canto, Concertapes, Dot, Elektra, Everest, Hifitape, Kapp, Liberty, Mercury, MGM, Omegatape, Roulette, Sonotape (Westminster), SMS, Vanguard, Verve, Vox, Warner Bros., World Pacific.

MANUFACTURERS AND DISTRIBUTORS

American Electronics, Inc.
 9449 W. Jefferson Blvd.
 Culver City, Calif.

Ampex Audio, Inc.
 1020 Kifer Road
 Sunnyvale, Calif.

Audio Fidelity, Inc.
 770 Eleventh Ave.
 New York 19, N.Y.

Bel Canto Magnetic Tapes
 2919 S. La Cienega Blvd.
 Culver City, Calif.

Bell Sound Division
 Thompson Ramo Wooldridge Inc.
 555 Marion Road
 Columbus 7, Ohio

Columbia Records
 799 Seventh Ave.
 New York 19, N.Y.

Concertapes, Inc.
 P.O. Box 88
 Wilmette, Ill.

Contemporary Tape
 8481 Melrose Place
 Los Angeles 46, Calif.

Cook Laboratories, Inc.
 101 Second Street
 Stamford, Conn.

Dot—c/o UST

Elektra—c/o UST

Everest—c/o Belock Recording Co.
 212-02 41st Ave.
 Bayside, L.I., N.Y.

Ercona Corporation
 16 W. 46th Street
 New York 36, N.Y.

Fantasy Records, Inc.
 654 Natoma Street
 San Francisco 3, Calif.

Grand Award Record Corp.
 8 Kingsland Ave.
 Harrison, New Jersey

Heath Company
 Benton Harbor, Mich.

Hifitape
 High Fidelity Recordings, Inc.
 7803 Sunset Blvd.
 Hollywood 28, Calif.

Hosho of America, Inc.
 1549 N. Vine Street
 Hollywood 28, Calif.

International Radio and Electronics Corp.
 (Crown)
 South 17th Street & Mishawaka Rd.
 Elkhart, Indiana

Kandy Tapes & Records Corp.
 203 N. Wabash
 Chicago 1, Illinois

Kapp—c/o UST

Liberty—c/o Bel Canto

Livingston Audio Products Corp.
 P.O. Box 202
 Caldwell, N.J.

Magnecord, Division of Midwestern Instruments, Inc.
 41st Street and Sheridan Road
 Tulsa, Okla.

Mercury Record Corp.
 35 E. Wacker Dr.
 Chicago 5, Illinois

MGM—c/o UST

Michigan Magnetics
 Vermontville, Michigan

Montilla
 131 East 23rd Street
 New York 10, N.Y.

Music Therapy Records
 P.O. Box 2458
 Santa Monica, Calif.

Newcomb Audio Products Company
 6824 Lexington Ave.
 Hollywood 38, Calif.

North American Philips Company, Inc.
 (Norelco)
 230 Duffy Avenue
 Hicksville, L.I., N.Y.

Nortronics Company, Inc.
 1015 South Sixth Street
 Minneapolis 4, Minn.

Omegatape
 6906 Santa Monica Blvd.
 Hollywood, Calif.

Pentron Corporation
 777 South Tripp Ave.
 Chicago 24, Illinois

RCA Victor Division
 Radio Corp. of America
 Camden 8, N. J.

RCA, Records Division
 155 E. 24th Street
 New York, N.Y.

Recordio Corporation
 Charlotte, Mich.

Roberts Electronics, Inc.
 1028 North La Brea Avenue
 Los Angeles 38, Calif.

Robins Industries Corp.
 36-27 Prince Street
 Flushing 54, N.Y.

Roulette—c/o UST

Sonotape Corp.
 275 Seventh Ave.
 New York 1, N.Y.

Stereophonic Music Society
 303 Grand Avenue
 Palisades Park, N.J.

Stereotape—Audio Arts
 5607 Melrose Ave.
 Hollywood, Calif.

Stereo Tape One-Stop
 303 Grand Avenue
 Palisades Park, N. J.

Superscope, Inc.
 8520 Tujunga Avenue
 Sun Valley, Calif.

Tandberg of America, Inc.
 8 Third Avenue
 Pelham, N.Y.

Telectrosonic Corp.
 35-18 37th Street
 Long Island City 1, N.Y.

UST (United Stereo Tapes)
 1024 Kifer Road
 Sunnyvale, Calif.

Vanguard—c/o UST

Verve—c/o UST
 Viking of Minneapolis, Inc.
 9600 Aldrich Avenue South
 Minneapolis 20, Minn.

V-M Corporation
 280 Park Street
 Benton Harbor, Mich.

Vox—c/o UST

Warner Bros.—c/o UST

Webcor
 5610 W. Bloomingdale Ave.
 Chicago 39, Illinois

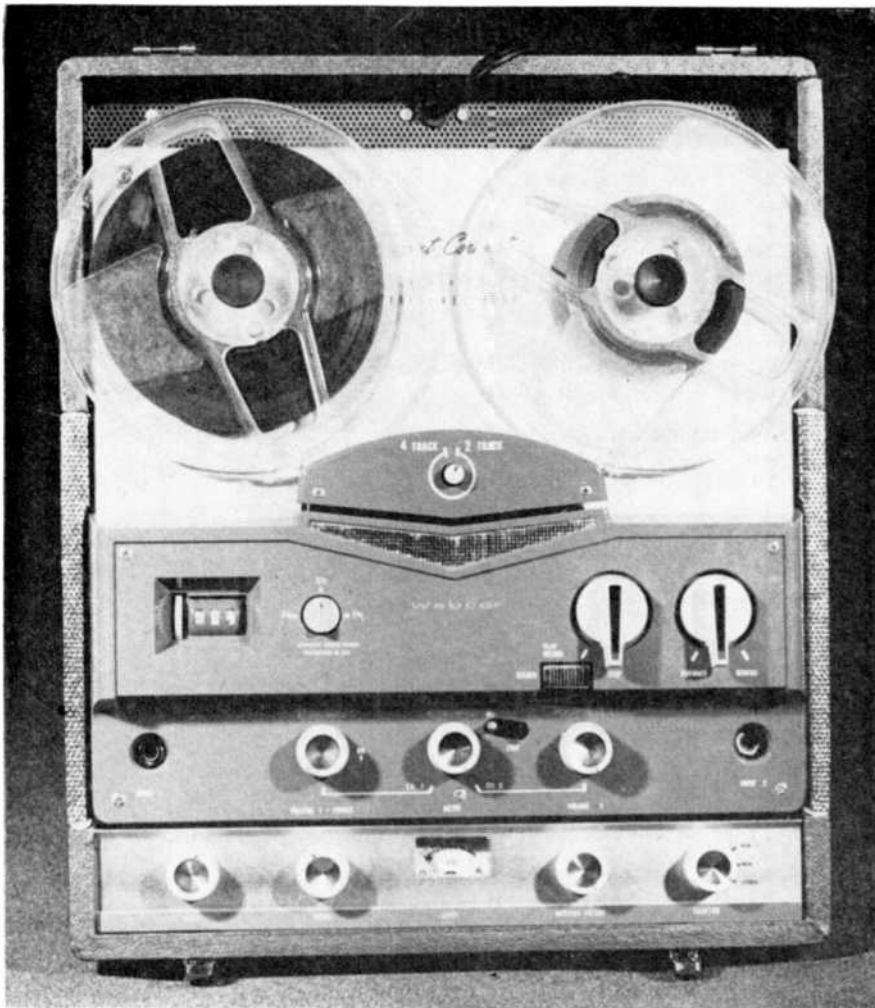
Webster Electric Co. (Ekotape)
 1900 Clark St.
 Racine, Wisconsin

WFB Productions, Inc.
 637 East Broad Street
 Souderton, Pa.

Wollensak Optical Company
 320 East 21st Street
 Chicago 16, Illinois
 World Pacific—c/o UST

NEW PRODUCT REPORT

STA **OK** STED



WEBCOR REGENT CORONET

. . . Full stereo recorder. Features VU meter, two microphones, four channel record and play.

THE Regent Coronet is the first fully stereo recorder that Webcor has produced and they have done a good job on it.

The unit will record two and four track stereo tapes as well as play them back. In addition it will record and play back either two track or four track monaural tapes.

The recorder also has three speeds, $1\frac{7}{8}$ " ips which is good for dictation, conference recording and the like, the $3\frac{3}{4}$ ips speed which provides good voice reproduction and fair music and the $7\frac{1}{2}$ ips speed which is tops on all counts.

The amplifier in the recorder provides 8 watts per channel or 16 watts

dual. Unusual in this machine is the mounting of the speakers. They are placed one on each side of the case. By standing directly in front of the recorder you can secure the stereo effect. This feature should make it easy for dealers to demonstrate the unit as there is no need to hook external speakers to it.

If the recorder is placed in the corner of a room at an angle to each wall, the walls will act as bounce boards and spread the sound to a much greater width than between the two speakers. The unit may also be placed flat against the middle of a wall with the sound reflected from the room floor and walls.

There are external speakers available in a matching case to the recorder.

Product: Webcor Stereo Recorder Regent Coronet

Price: \$319

Manufacturer: Webcor, 5610 W. Bloomingdale, Chicago, Ill.

Each speaker unit has an 8" speaker and a 4" speaker with a crossover network. The two speakers have angled faces so that when they are placed together bottom to top they form a square carrying unit with a handle.

The machine may be used in either the horizontal or vertical position. In the latter, rubber reel locks hold the reels in place so they will not spill off the machine.

Recording volume level control is by means of a VU meter and each channel has its own volume control, both for recording and playback. The VU meter may be switched to either channel by means of the VU selector switch, the knob for which is mounted directly above the VU meter.

In practice the microphones are set up first and each channel checked independently. From a single sound source centered between the two the volume should be identical. Volume can also be checked by speaking into each microphone alternately using the same degree of loudness and distance from the mike.

Stereo recording from stereo tuners, records or other sources is accomplished by using two input cords No. A 2925. The two cords supplied with the unit are for connection to the microphones or to the external speakers but should



Regent Coronet case is finished in grey with a broad band of metallized cloth as shown in the photo above.



Right and left sides of the recorder face. Left side contains counter, speed change knob, channel 1 input jack and volume control and bass and treble controls. Right side of recorder has record/play lever, fast forward/rewind, edit key, VU meter, monitor switch and stereo monaural selector switch.

not be used for patch cords to other types of equipment.

Controls include separate bass and treble, volume controls for each channel, a monitor switch, stereo/monaural selector switch, fast forward and rewind and a play and record with safety interlock to prevent accidental erasure. There is also an edit key which stops or starts the tape instantly.

An odometer type counter is used for selection indexing. The input jacks are on the face of the recorder. The outputs, which include a set of two for external amplifier and two for connection directly to external speakers are situated on the rear of the machine.

In addition to its functions as a recorder, the machine may also be used as a PA system by turning the monitor switch on and plugging in the external speakers. The unit may be used as a stereo PA system by using both mikes and two speakers. At the same time that the recorder acts as a PA system,

it will also record the proceedings.

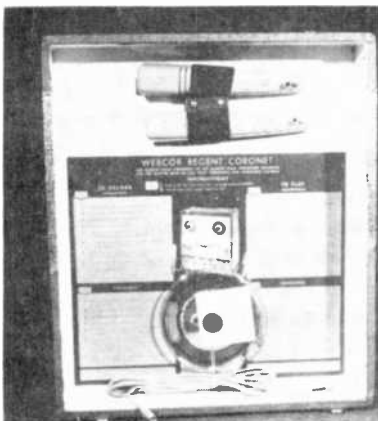
In recording all four tracks separately, the microphone is put into the first channel and the selector switch turned to monaural 1. Put the head in four track position and make the first recording. Next flip the reels and record again, with the indicator still on monaural 1. Change the indicator to monaural 2, flip the reel and make your recording, flip the reel again and finish.

To play back each of the tracks separately you follow exactly the same routine as when making the recordings.

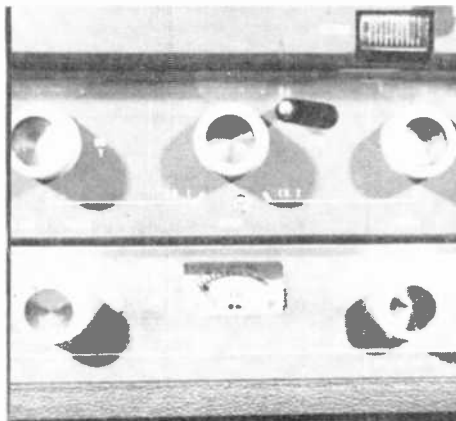
The instruction book accompanying the recorder is complete (in fact it is 24 pages) and profusely illustrated.

We found the machine to be well-built and rugged. It is quiet in operation and no difficulty was experienced in its use.

We feel that this machine is worth the price asked for it and should be worthy of your consideration if you are planning to purchase a stereo recorder.



Left: complete operating instructions are printed in the lid which also contains straps to hold the microphones for storage. Right: the VU meter is in the center of the panel with the selector switch and volume controls above.



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1608-A CENTINELA AVE., INGLEWOOD, CALIF

TAPE RECORDERS

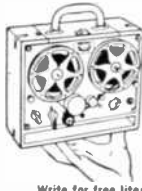
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SHOP OR SWAP

Advertising in this section is open to both amateur and commercial ads. HI-FI TAPE RECORDING does not guarantee any offer advertised in this column and all swaps, etc., are strictly between individuals.

RATES: Commercial ads, \$.30 per word. Individual ads, non-commercial, \$.05 a word.

Remittances in full should accompany copy. Ads will be inserted in next available issue. Please print or type your copy to avoid error. Address ad to: Shop or Swap, Hi-Fi Tape Recording Magazine, Severna Park, Md.

CONCERTONE 62 Monaural Record-Stereo Playback. Cost \$655. Wanted \$300 or best offer. Must sell. Only two months old and still have warranty card and original carton. Robert L. Stewart, 27 Tarrytown Lane, Worcester 2, Mass.

WANTED: Records and transcriptions prior to 1940, \$5 each, latter. James Orlando, Dickerson Run, Pa.

SAVE ON TAPE RECORDERS, tapes, records, equipment, duplicating. Lowest prices. No obligation. Send name and address CTG Recording Studios Inc., 4448 Forest Park, St. Louis 8, Mo.

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

WANTED: Tape Recording Magazine No. 5, Vol. 1, Aug. 1954. Name price. A. C. Franson, 1565 Susitna St., Anchorage, Alaska.

27 NEW WAYS to make money with your recorder. Businesses anyone can start—\$1.00. Recording Ideas, 424 Slattery, Shreveport, Louisiana.

FOR SALE: Tandberg Quadruple Stereo Model 5-2, new guarantee, original carton. Records/Plays dual or quadruple stereo and up to 4 tracks monaural. Special—save \$125 off now! New Model Recordio #602 latest model. Regular \$129 value—Will lose \$35. Also Bell BT-76 3-speed stereophonic model good condition. Cost \$174.50. Will sell for only \$120. Gotta move—If the above prices are too high—make a bid. All goes. Box #8, Lewisburg, Tenn.

RECORD CUTTING for every occasion from your tape to unbreakable disc. Weddings, socials, lectures, schools. Free information. Albergo Recording Studio, 121-18 Rockaway Blvd., South Ozone Park 20, N. Y.

PROFESSIONAL RECORDING TAPE—First quality of a prime manufacturer. Full frequency response. Finest polished and lubricated tape available. Money back guarantee. Acetate 1200', 112 mil, 4/\$5.20. 1800', 1 mil, 4/\$6.75. Mylar 1200', 112 mil, 4 \$7.00. 1800', 1 mil, 4 \$9.00. 2400', 1/2 mil, 4/\$13.00. Postage 15c per reel. Hisonic, Box 86LL, New York 63, N. Y.

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

FOR SALE: Simpson Panel VU Meter. Perfect condition, \$11 postpaid. 80 45 rpm records—Ragtime Piano, Western, Polkas, etc. Order 1 or all. Seldom used and good as new. Many EP's. Only 25c each postpaid. Clifton R. Boyce, 117 Evergreen, Pitman, N. J.

DON'T BUY stereo equipment until you check our prices. Bayla Co., 1470-T Elmer Road, Waukegan, L. I.

AM INTERESTED IN STARTING recording company or label to record local talent. Would like to exchange tapes with anyone able to give me information and advice about artist contracts, getting records pressed, agents, distribution, fees, etc. Especially would like to hear from anyone having formed or worked for independent company. Will furnish all tapes. George Booth, 424 Slattery, Shreveport, Louisiana.

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

RENT STEREO TAPES—over 800 different—all major labels—free catalog. Stereo-Parti, 1608-F Centinela Ave., Inglewood 3, California.

HIGH FIDELITY RECORDING TAPE. Made directly for us by one of America's leading manufacturers. Guaranteed new and splice-free. Low, low prices! Smartly boxed. 7" reels, 1200' 1 1/2 mil acetate, \$1.40 or 3 for \$3.90; 1800' 1 mil acetate, \$2.00; 1800' 1 mil Mylar, \$2.70; 2400' 1/2 mil Mylar, \$3.25. Postage and handling 20c per single reel, 50c per lot of 3, 50c per each additional lot of 3. Write for complete price list. Tape Company of America, Dept. A-6, PO Box 50, Jersey City 3, N. J.

CONCERTONE 29-7 Stereo Tape Player with 3 acousti craft cabinets (Mahogany). Two Concertone amplifiers and speaker systems included. Will sell with or without cabinets. Cost \$1014 new, sacrifice for \$500. Albert T. Waters, Jr., 65 Gage Street, Kingston, New York.

LEARN TO BE A Tobacco Auctioneer easily, quickly, by "Tape" from a 30 year pro. Just \$35 this month, satisfaction guaranteed. Col. Baker, Box 191, Hendersonville, Tenn.

TRADE: Movie Camera Bolex H8 Deluxe complete Kern Lenses (3). Wanted—Stereo Record Playback, 10 1/2" reel tape recorder. Write Carl Fiene, Steepleville, Ill.

SELL—AMPEX 612 7 1/2" i.p.s. stereo playback unit (synchronous motor); two amplifier-speaker units Ampex Model 620, all in walnut furniture cases, excellent condition, \$375 for three units. L. A. Albano, 130 Hawthorne Avenue, Utica, New York.

FOR SALE: Pentron CA-13 record/play preamp, \$35. Robert Stafford, 1044 Glendale Ave., Columbus 12, Ohio.

"FAMOUS," CHRISTMAS: "SWISS REVOLVING multi-colored beacons". Limited supply left (below wholesale). "Xmas" price: \$16.50! Guaranteed, unconditionally. U.L. approved. "Welcome Lights" outdoors or indoors! "Lonestar", Box 191, Hendersonville, Tennessee.

TRADES WANTED: Tapes of extensive recorded jazz collection for TV, radio, and recorded spoken literature, drama, etc. Lloyd Lacy, 832 El Caminito, Santa Fe, N. M.

WANTED!

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AMPEX 960

STEREOPHONIC

RECORDER/REPRODUCER

Plays Both 2- & 4-Track Tape



RECORDS STEREO
OR MONOPHONIC

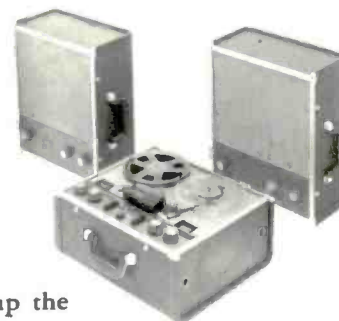
Stereo Portable PLUS!

Guiding the Ampex engineers who created the 960 was a dual objective—that of building a machine which was not only a superb example of engineering skill, but one which would also offer its user a range of capabilities far exceeding that of any other recorder made today. The result was not merely an improved stereo recorder, but an *entirely new concept* in home entertainment.

The STEREO 960 fits into family life in literally dozens of ways, contributing many tangible benefits in musical, educational and recreational fun. You'll use it to keep up the family correspondence by sending "letters in sound", to tape stereo programs off the air, to preserve your best monaural and stereo discs on tape, and to acquire new musical and language skills. You'll have endless fun exploring the 960's many fascinating recording capabilities, including sound-on-sound, echo chamber effects, and other advanced techniques.

ABOVE--960 PORTABLE STEREO
RECORDER/REPRODUCER

BELOW--MODEL 2580 PORTABLE
STEREO SYSTEM CONSISTING OF
960 AND PAIR OF 2010
AMPLIFIER-SPEAKERS



AMPEX STEREO

SIGNATURE OF PERFECTION IN SOUND

RECORDER/REPRODUCER SPECIFICATIONS

The true values of a recorder are best assessed through careful evaluation of its performance specifications and operating features. It is worthwhile noting here that these specifications are based not on theoretical design parameters but on actual performance tests. They are specifications which the recorder not only meets or exceeds today, but which years from now will still hold true. The Ampex Model 960 Stereophonic Recorder/Reproducer is capable of essentially distortionless frequency response from 30 to 20,000 cycles per second at the operating speed of 7 1/2 inches per second, and from 30 to 15,000 cycles per second at 3 3/4 inches per second. Its precision-engineered timing accuracy is such that it offers perfection of pitch held to tolerances of less than one-third of a half-tone. Playing times, using standard (.002"), long play (.0015"), and extra-long play (.001") tapes are as follows:

	(a) 4-Track Stereo Tapes	(b) 2-Track Stereo Tapes	(c) Monaural Tapes, half-track
1200 foot reel	3 3/4 ips - 2 hrs. 8 min. 7 1/2 ips - 1 hr. 4 min.	3 3/4 ips - 1 hr. 4 min. 7 1/2 ips - 32 minutes	3 3/4 ips - 2 hrs. 8 min. 7 1/2 ips - 1 hr. 4 min.
1800 foot reel	3 3/4 ips - 3 hrs. 12 min. 7 1/2 ips - 1 hr. 36 min.	3 3/4 ips - 1 hr. 36 min. 7 1/2 ips - 48 minutes	3 3/4 ips - 3 hrs. 12 min. 7 1/2 ips - 1 hr. 36 min.
2400 foot reel	3 3/4 ips - 4 hrs. 16 min. 7 1/2 ips - 2 hrs. 8 min.	3 3/4 ips - 2 hrs. 8 min. 7 1/2 ips - 1 hr. 4 min.	3 3/4 ips - 4 hrs. 16 min. 7 1/2 ips - 2 hrs. 8 min.

RECORD INPUTS: High impedance line inputs (radio/TV/phono/auxiliary) 0.3V rms for program level; high impedance microphone inputs

PLAYBACK OUTPUTS: Approximately 0.5V rms from cathode follower when playing program level tapes

PLAYBACK FREQUENCY RESPONSE: 30-20,000 cps at 7 1/2 ips; 30-15,000 cps at 3 3/4 ips
Within ±2 db 50-15,000 cps at 7 1/2 ips, 55 db dynamic range
Within ±2 db 50-10,000 cps at 3 3/4 ips, 50 db dynamic range

FLUTTER AND WOW: Under 0.2% rms at 7 1/2 ips; under 0.25% rms at 3 3/4 ips

HEADS: Manufactured to the same standards of precision that exist in Ampex broadcast and recording studio equipment. Surfaces are lapped to an optical flatness so precise that they reflect specified wavelengths of light, resulting in uniform performance characteristics and greatly minimizing the effects of head wear. Azimuth alignment of stereo head gaps in the same stack is held within 20 seconds of arc, equivalent to less than 10 millionths of an inch—a degree of precision achieved through use of a unique process involving micro-accurate optical measurements within a controlled environment. Head gap width is 90 millionths of an inch ±5 millionths of an inch.

KEY TO THE EXCITING FUN FEATURES OF THE 960--

THE AMPEX STEREO-GRAPH

Here's the simplest, quickest answer to almost every question about how to perform the operations illustrated at right and numerous other recording functions. The Ampex Stereo-Graph shows you, quickly and clearly, the proper dial settings to make for more than a dozen of the most popular uses for the 960 . . . including sound-on-sound, language and music instruction,



and other special effects. A convenient tape footage/playing time indicator is included on the reverse side.

MODEL 2010 MATCHING AMPLIFIER-SPEAKER

The Ampex Model 2010's ten-watt (20 watts peak) amplifier section provides operating characteristics (unequalized) flat within ±0.1 db, with total harmonic distortion less than 0.5 of 1%, throughout the maximum range of human hearing ability, at rated output. Noise and hum are 80 db below rated output, and input sensitivity is 0.18V to develop rated power.

The specially designed 8" speaker provides smooth, peak-free response throughout a remarkably wide audio range. Such superior design features as its massive die-cast frame and edgewise-wound ribbon coil contribute effectively to higher levels of performance than ever before achieved with a speaker this size.



MODEL 960 DIMENSIONS: Portable cases 9" x 15" x 17 1/2". Unmounted recorder 13" x 15" x 6 1/8" depth below top plate, 1 3/8" above. Recorder weight 36 lbs., speaker amplifier 31 lbs.



Relax and enjoy the show—let your Ampex do the narration! With the commentary on tape, your color slide shows are more professional, more complete, and more fun!

Your favorite LP's and Stereo Discs are at their exciting best while they're new and unscratched. That's when to tape them on your Ampex, and preserve their original quality for keeps!



When you tape it "off the air" your only cost is for blank tape. Yet your musical repertoire can soon equal that of all the stations you hear!

There's a real future in family fun like this—with your Ampex you can live such happy moments over and over again, with a quality so lifelike you're almost literally carried back.



In the Ampex "Speech Testing Game", you pit your wits against the trigger-quick memory of the Ampex recorder/reproducer. You can't win, but it's fun trying.



Letter-writing is no longer a problem, with an Ampex in the house . . . now it's a family project. And even more fun than sending letters in sound is receiving them!



For "letters in sound", the 3" tape reel holds as much as a 10-page letter, mails first class anywhere in the United States for 8c.



A command performance, exclusively for you! Whether you prefer jazz, pops, or classical, the privacy of headphone listening is a unique pleasure. You don't disturb the rest of the family, and they don't disturb you!



The Ampex, in private rehearsal, can be a wonderful confidence-builder for people who normally develop rubber knees when faced with the prospect of speaking before a group.

Learning to speak a new language is made immeasurably easier on the Ampex; you can record your own phrases side-by-side with those of the instructor, and play them back for comparison at any time.





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



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

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

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

When you buy your next reel of tape,

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

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



Better Things for Better Living
... through Chemistry



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



Paul G. Bohack, Jr., Treasurer of H. C. Bohack Co., Inc., recording with his family: Mrs. Juanita Bohack, Pamela Jean (left), and Paula Anne.

When there's no second chance...

LOAD WITH ACETATE BASE TAPE

Moments like this come once in a lifetime, but you can recall them perfectly year after year with Celanese Acetate base tapes. These tapes eliminate background noises . . . permit faithful reproduction. Acetate base tapes resist stretching even under strong rewind tension. In fact, when acetate base tapes are subjected to high shock loads, they break cleanly with virtually no stretch. They are then easily repaired with pressure-sensitive splicing tape. Other base tapes may stretch to twice their length before breaking, and the stretched portion of tape is almost impossible to repair. Stretched tape is a

major cause of "wows."

Leading producers of hi-fi monaural and stereophonic recordings use acetate base tapes. Give your own library of recordings the same high quality advantages.

And, remember, acetate based tapes are more economical, too!

Acetate for recording tape is produced by Celanese for conversion into tapes by all leading tape manufacturers. Look for the name acetate on each box of tape you buy, or check with your dealer.

Celanese®

Acetate... a *Celanese* plastic film

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Canadian Affiliate: Canadian Chemical Company Limited, Montreal, Toronto, Vancouver

Export Sales: Amcel Co., Inc., and Pan Amcel Co., Inc., 180 Madison Avenue, N. Y. 16