

tape recording

60¢

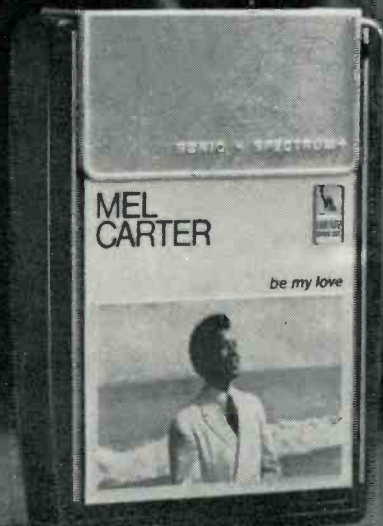
Confessions
of an Electronic
Eavesdropper

Special Issue: 20 Years of Home Tape Recording



SONIC-SPECTRUM +

THE ULTIMATE IN
RECORDED SOUND QUALITY
ON TAPE CARTRIDGES



SONIC-SPECTRUM + is a technological advancement by Liberty Stereo-Tape that represents a major breakthrough in recorded sound on 4 track and 8 track cartridge tapes! New duplication techniques, exclusive to Liberty, and a superior new tape, have resulted in a dynamic new sound with a range and quality never before attainable on pre-recorded cartridge tape!

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THE VENTURES	"THE VENTURES IN SPACE"	4800/8800
THE JOHNNY MANN SINGERS	"A MAN AND A WOMAN"	4801/8801
GARY LEWIS	"LISTEN"	4802/8802
MEL CARTER	"BE MY LOVE"	4803/8803

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microphones, in every
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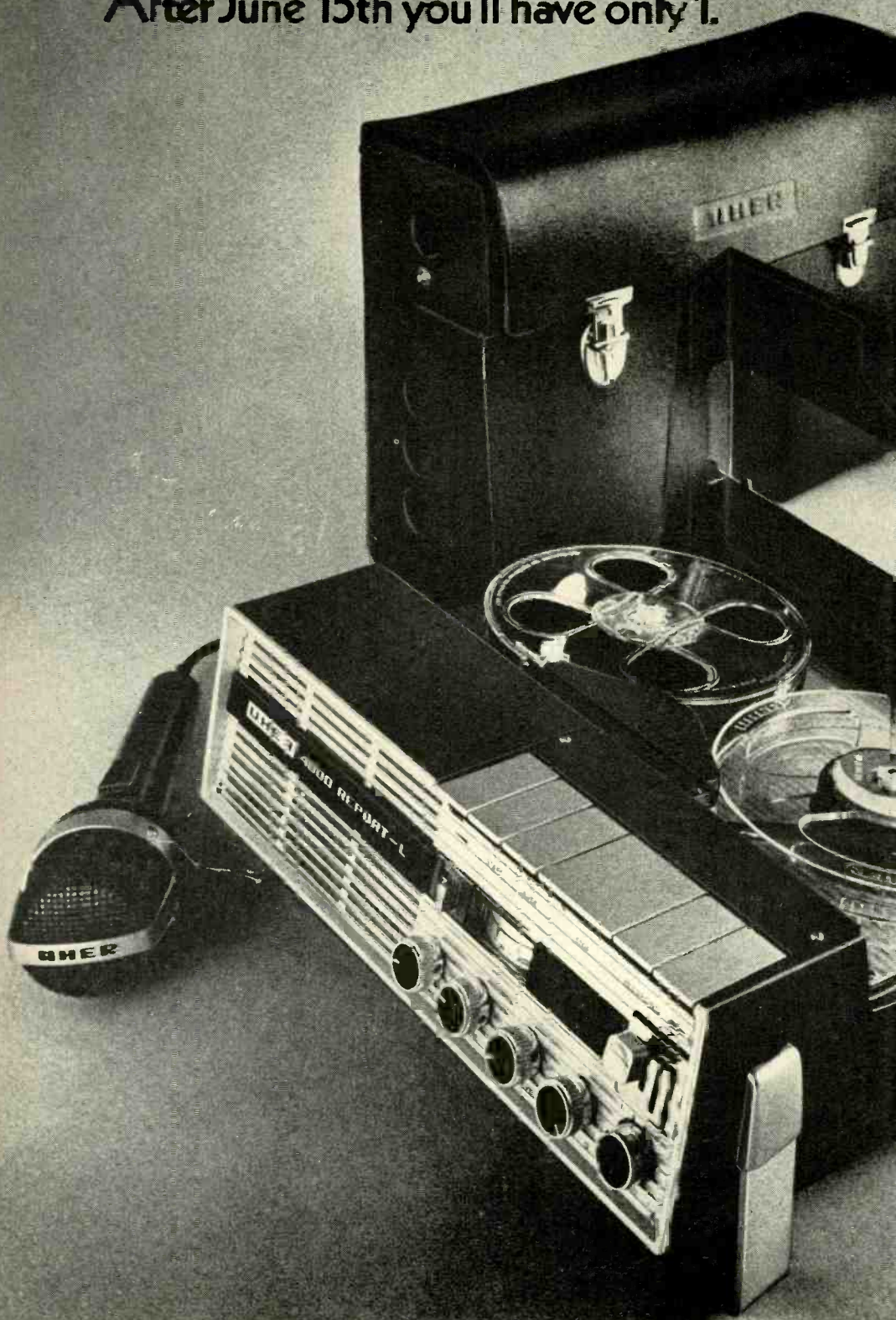
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Now you have 101 reasons to buy the Uher® 4000 Report-L.

After June 15th you'll have only 1.



The first 100 reasons are all one dollar bills you won't have to part with, during our "Own the Best" sale. The UHER 4000-L will cost you \$340 instead of \$440, now through June 15th.

The 101st reason...and the most important one...is quality. The UHER 4000 Report-L is the world's finest portable tape recorder. A lightweight 7 pounds that goes anywhere comfortably, the UHER 4000-L is solid state and operates on rechargeable or ordinary batteries.

It does everything the professional wants it to do, up at the Arctic or down at the Equator. That's why it's first choice with explorers, naturalists, reporters, radio and TV commentators, as well as doctors, scientists and lawyers. It records or plays back at four speeds and gives you great frequency response with each. It has a highly visible, three digit index counter with a push-button reset.

Audio Magazine calls it "Magic in a Matchbox." Professionals call it the greatest. Now that we've made it \$100 easier to "Own the Best," clip the coupon, take it to your UHER dealer and walk out with 7 pounds of greatness... the UHER 4000 Report-L.

Save \$100.

Upon presentation of this coupon to any UHER dealer, the bearer may purchase the world famous UHER 4000 Report-L Tape Recorder at the special price of \$340. (Regular price \$440). This unique "Own the Best" offer includes the following high quality accessories for the UHER 4000:

Dynamic Microphone with built in wind screen, music/speech switch (#M514)
• Long Life Accumulator Dryfit battery pack (#433) • AC power supply and battery charger (#880) • Genuine Leather Carrying Case (#861).

This offer expires June 15, 1968 and is applicable only on the UHER 4000 Report-L Tape Recorder.

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tape

recording

JANUARY, 1968

VOL. 5, NO. 2

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Tape Recording: Publisher: Richard Ekstract; Editor: Robert Angus; Managing Editor: Fred Petras; Circulation Mgr.: Anne Rossi; Music Editor: Erwin Bagley; Technical Editor: Peter Whitelam; Tape Club News Editor: Fred Petras; Art Director: Everette Short; Contributing Editor: Walter G. Salm.

Tape Recording (title registered U.S. Pat. Off.) is published seven times a year (bi-monthly except January-February when monthly) by A-TR Publications, Inc., Richard E. Ekstract, President; Robert N. Angus, Secretary; executive and editorial offices, 158 East 52nd St., New York, N.Y. 10022. Subscription rates: U.S. and Canada \$3.00 for one year, \$5.00 for two years, all other countries \$4.50 per year. Second class postage paid at New York, N.Y. and at additional mailing office. Single copies 60 cents. Entire contents copyrighted 1968 by A-TR Publications, Inc.

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have been turning
their records
this way for years.
Now it's your turn.*



Meet Garrard's newest and finest automatic transcription turntable, the SL 95...so advanced that even its motor sets new standards in record reproduction! The SL 95 is powered by Garrard's revolutionary new SYNCHRO-LAB MOTOR™, that gives you the matchless benefits of absolutely constant speed—*synchronous speed*—plus instant induction starting power and notable freedom from rumble and distortion.

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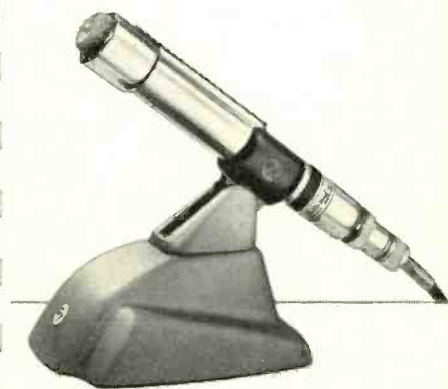
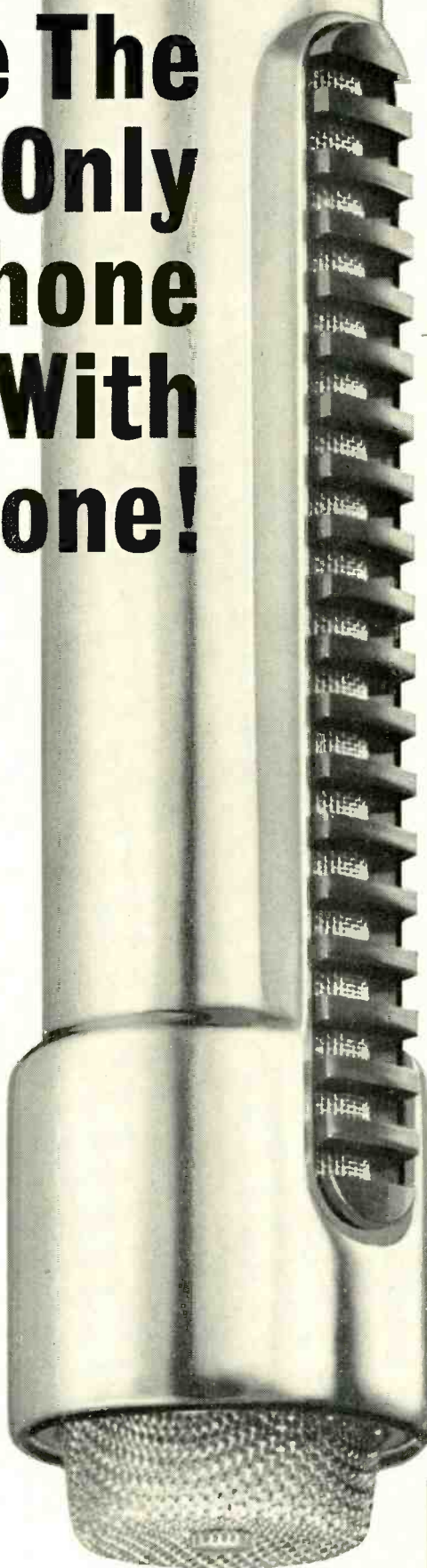
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For Tough Recording Jobs Choose The Only Microphone With Backbone!



**ELECTRO-VOICE
MODEL 676
DYNAMIC CARDIOID**

EY The backbone of the Electro-Voice Model 676 is no mere decoration. It's visible proof of the most exciting idea in directional microphones—Continuously Variable-D (CV-D)[™].

And it takes a directional microphone to solve your tough recording problems: bad acoustics, audience noise, poor balance between performers.

Here's how CV-D works. We attach a very special tapered tube to the back of the microphone element. This tube automatically varies in effective acoustic length with frequency. It's a long tube for lows — a short tube for highs. All this with no moving parts! The tube is always optimum length to most effectively cancel sound arriving from the back of the microphone, regardless of frequency.

This ingenious solution* is years ahead of the common fixed-path designs found in most cardioid microphones. The 676 offers significantly smoother response at every point—on or off axis—plus more uniform cancellation to the rear. It is also less sensitive to wind and shock. There is almost no "proximity effect"... no boosted bass when performers work extra close.

Long life and smooth response are guaranteed by the exclusive E-V Acoustalloy[®] Diaphragm. And the

676 has unusually high output for a microphone so small. Of course you get dual output impedances, high efficiency dust and magnetic filters—all of the hallmarks of Electro-Voice design that have made E-V a leader for years.

But that's not all. The 676 has an exclusive bass control switch built in. Choose flat response (from 40 to 15,000 cps) or tilt off the bass 5 or 10 db at 100 cps to control reverberation, reduce low frequency feedback and room rumble.

Write today for complete specifications, or visit your E-V sound specialist's to see this remarkable new microphone. And when difficult recording problems must be faced squarely, stand up and fight back with the microphone with a backbone (and CV-D)—the new Electro-Voice 676 dynamic cardioid!

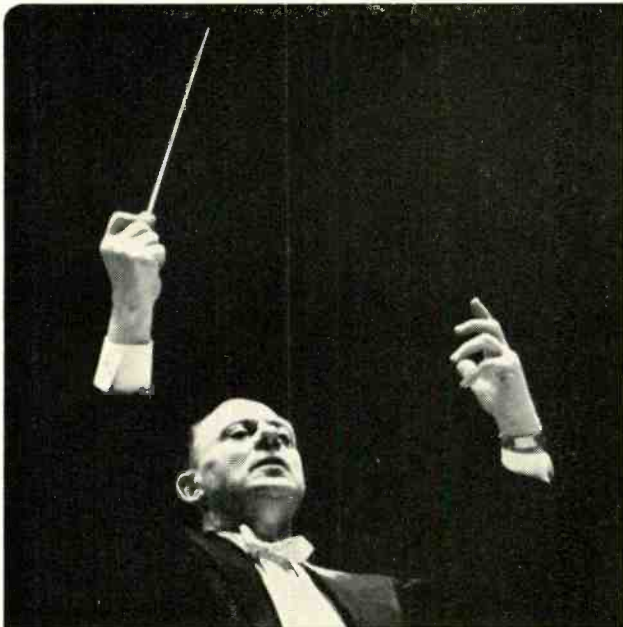
Model 676 Satin Chrome or TV Grey, \$100.00 list; in Gold, \$110.00 list. Shown on Model 420 Desk Stand, \$20.00 list. Model 674 identical except stud-mounted with On-Off switch. \$100.00 list. (Less normal trade discounts.)

ELECTRO-VOICE, INC.
Dept. 182TR, 637 Cecil Street
Buchanan, Michigan 49107

*Pat. No. 3,115,207



Build a world of your own on "Scotch" Brand Dynarange® Tape.



Great moments in music . . . happy times at home and away—capture whatever sound you want to save on "Scotch" Brand "Dynarange" Recording Tape. "Dynarange" delivers true, clear, faithful reproduction across the entire sound range. Makes all music come clearer . . . cuts background noise . . . gives you fidelity you didn't know your recorder had.

And "Dynarange" saves you money, too! Delivers the same full fidelity at a slow 3¾



speed that you ordinarily expect only at 7½ ips. The result: You record twice the music per foot . . . use half as much tape . . . save 25% or more in tape costs! Lifetime silicone lubrication protects against head wear, assures smooth tape travel and extends tape life. Isn't it time you built your own private world of sound on "Scotch" Brand "Dynarange" Recording Tape?

Magnetic Products Division **3M** COMPANY

"SCOTCH", "DYNARANGE" AND THE PLAID DESIGN ARE REGISTERED TRADEMARKS OF 3M CO.

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recording?



**koss stereophones
tell you everything
that's going on**

Want to hear exactly what the tape is picking up? Slip on a pair of Koss Stereophones and you'll hear it all. Lets you make quick adjustment on tone, volume and microphone balance. It's a real session-saver, especially when there can't be another "take."

For editing, Koss Stereophones are a must. They provide personal listening, so you can't distract others with the constant replay of recorded material. And you can't be distracted by outside noises, so the editing job is a lot easier and quicker.

Next time you record, edit or playback, try Koss Stereophones. And listen to the difference.



K-6
\$26.50

PRO-4A
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KO-727
\$34.95

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KOSS

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Export Cable: STEREOFONE • Koss-Impetus/2 Via Berna/Lugano, Switzerland

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tape

NEW PRODUCTS

TANDBERG OF AMERICA, INC., Pelham, N.Y.: Model 11 battery-operated mono half-track tape recorder, list priced at \$599.

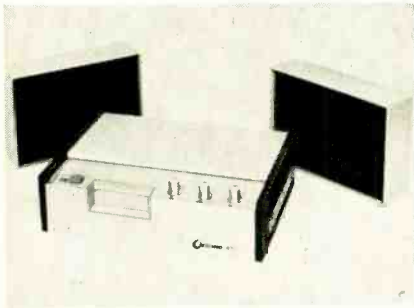


Features: VU meter which acts as recording level meter and as limiter indicator, momentary stop/start, front panel inputs and outputs, pilot light, fast rewind, 7-inch reel capacity, provision for pilot head for use with film cameras. Runs on 10 1.5-volt batteries. Optional house current operation via battery eliminator.

Specs: Response at 7½ ips 40 to 16,000 Hz plus-or-minus two db. Wow and flutter better than 0.2 per cent peak. Signal-to-noise ratio better than 56 db at maximum recording level at 7½ ips. Three-speeds.

VIKING DIVISION OF TELEX CORP., Minneapolis: Model 811P eight-track stereo tape cartridge player ensemble for home use, list price at \$149.95.

Features: Numerical track indicator, push-button and automatic track selection, ganged tone and volume controls, balance control,



stereo headphone jack, two 5¼-inch speakers in matching housings, two-tone vinyl finish. (Model 811W at the same price comes in walnut cabinetry.)

Specs: Response 40 to 15,000 Hz, signal-to-noise ratio 50 db peak, flutter and wow 0.3 per cent rms, power output 10 watts (IHF).

UNITED AUDIO, New York City: Dual Model TG27 four-track stereo tape deck, list priced at \$199.50.

Features: Hyperbolic-curved heads for optimum tape contact without pressure pads, mixing control for two mono channel inputs, sound-on-sound, VU meter, automatic tape-end stop, instant reset tape counter, headphone output, tape-governed braking action, instant stop (pause control). Optional combination walnut base and plastic dust cover, \$34.50.



Specs: Runs at 3¾ and 7½ ips. Measurements: 14½ x 11 inches. Response at 7½ ips 25 to 16,000 Hz plus-or-minus two db. Signal-to-noise ratio 50 db minimum. Wow and flutter 0.1 per cent maximum.

Limited offer: Buy a Norelco portable tape recorder get a \$12.95 extension speaker for \$3.95

When you buy the Carry-Corder® '150' or the Norelco '175', mail the warranty card for either machine, with a check or money order, to North American Philips Company, Inc., Dept. T, 3010 Review Ave., Long Island City, New York 11101. And we'll send you the extension speaker direct.

Just plug it in. And you'll see that we build more sound into our portables than a portable-sized speaker can do justice to.

Now you can take advantage of this extra power and signal quality. You'll get even greater sound along with the convenience of a cassette machine. And with a cassette machine you don't have to thread the tape at all. Just snap in the cassette and you're ready to record or playback—for up to 90 minutes.

This offer lasts from now until March 15. So, see your Norelco dealer right away.



Norelco®

the re-inventor of tape recording

North American Philips Company, Inc., High Fidelity Products Department,
100 East 42nd Street, New York, N. Y. 10017

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**NEW FROM
UNIVERSITY![®]
A TRULY
AUTOMATIC
MICROPHONE
STAND
THAT CAN BE
ADJUSTED
- IN ACTION -
QUICKLY -
AND EASILY.**

- POSITIVE CLUTCH
- AUTOMATIC LOCKING

At last! A modern space-age design for microphone floor stands. One hand jam-free operation! No twisting of collars! No slipping! New University floor stand moves up or down s-m-o-o-t-h-l-y to stay in place. Choose from three non-reflecting finishes in natural, gold or blue fluted anodized aluminum. Extra stable weighted base! See your University dealer for complete and free details today or write desk # A-819.



LISTEN—UNIVERSITY[®] SOUNDS BETTER
UNIVERSITY SOUND
A DIVISION OF LTV LING ALTEC, INC.
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tape

LETTERS TO THE EDITOR

Detroit, Mich.

I read with great interest your article entitled *The Copyright Law and You* on page 24 of the December issue. Air Check and our Division Videochex are in the business of monitoring, filming audio and videotape recording "off-the-air" commercials, interviews and programs. Your readers may be interested to know that when a person or firm records a commercial, interview or program for another person or firm who is legally entitled to same, it becomes legal.

An advertising agency may want to "air check" their own client's commercial, a sponsor may want an "air check" of his own program, an announcer or newscaster or performer may want an "air check" of his or her appearance, a public relations firm may want to "air check" an interview they've planned, the National Association of Broadcasters may want to "air check" one of their member and Code Subscriber radio or television stations, etc.

Radio and television stations, like newspaper and magazine publishers, etc, are licensed by an agency of the Federal Government (the Federal Communications Commission). It would seem to me that any Law which would forbid an American citizen to audio or videotape any radio or television program, and, either utilize it for their own education or entertainment, or, in fact, supply it to any other person, whether free, or loan or at their cost, would be unconstitutional. If radio and television stations can be licensed by the Federal Government to earn a profit, so, a person with a tape recorder should be able to, if he or so desires, record anything at any time for any purpose.

Although Air Check and Videochex do not sell or record programs as such, but deal mainly with commercials, I do feel that individual's

will record programs, and even sell or trade them with other individuals, without any interference from H.R. 2512.

John Kluyzcinski

Westport, Conn.

Insofar as I am concerned, the reading of your article "The Copyright Law and You" in the December issue was worth many times the price of my subscription. I want to thank you very much for the thorough analysis of the present legal status of taping and also how it would fare in the event that the new Copyright Law is passed.

I am not only a tape recording buff, but my position at Doubleday & Co. is one that requires my obtaining all of the copyrights of that company. Therefore, I read your article with unusual interest. I have not made up my mind about your suggestion that Section 107 of the new Copyright Act be changed to exempt non-profit home recording. Of course, as a hobbyist I would be happy with this exemption, but I would like to think about it more in respect to what commercial implications it might have. My initial reaction, however, is that I agree with you; that if there is any harm at all it would be of such a minor nature in view of the good for all that it should be written off.

It is expected now that there will be no action by the Subcommittee until June, which will not leave much time for action before adjournment of the 90th Congress.

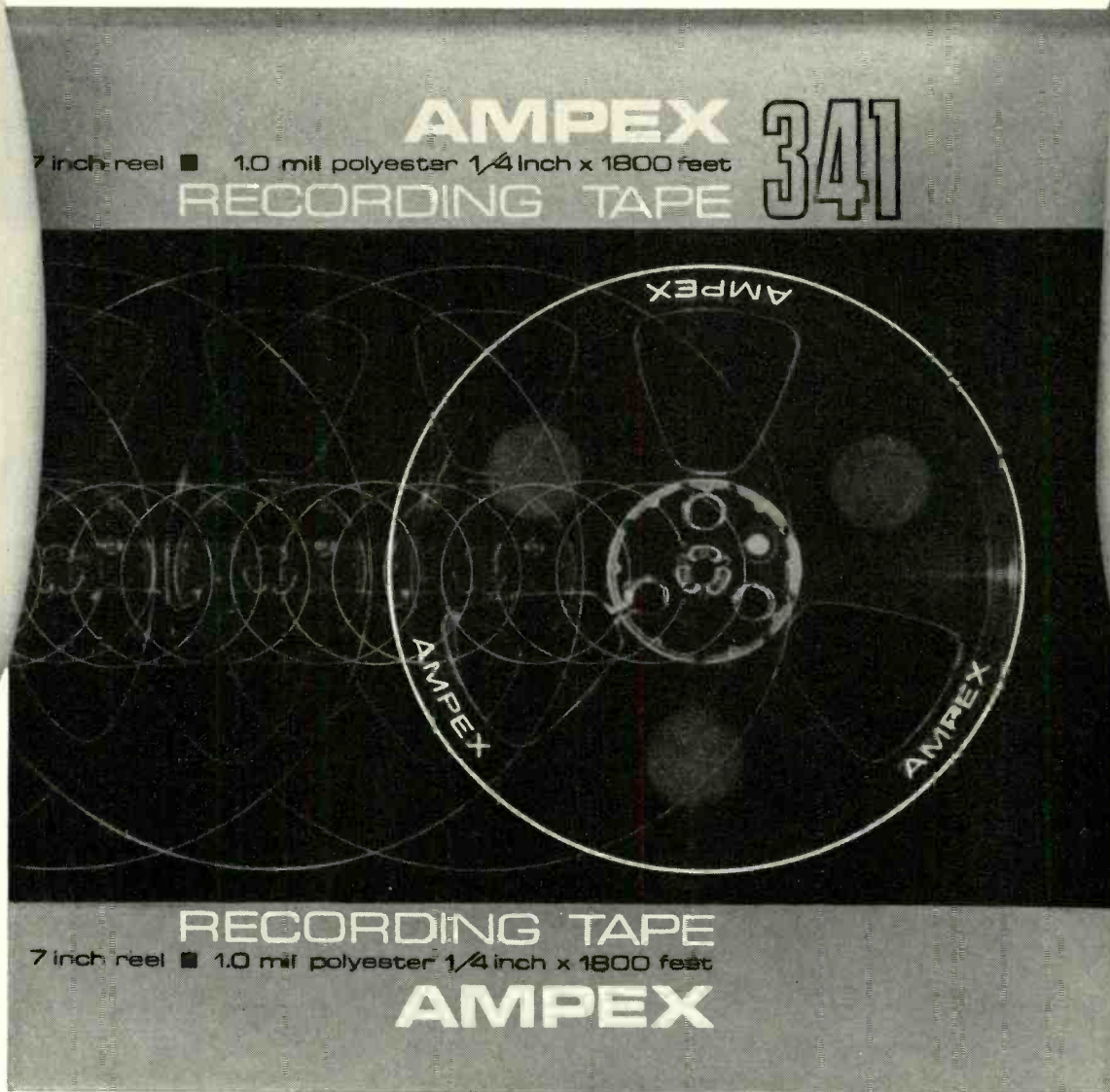
Again, I wish to thank you for publishing such an exceedingly interesting article. I called it to the attention of the Copyright Association of the USA so that they might cite it in their bulletin as a worthy article in regard to copyright.

Lawrence H. Reed

Ampex will sell you
 cur great sounds at half price...



to get you to put your great sounds on Ampex tape!



When you buy tape for your own recording uses, be sure it's the kind of tape you'd choose if you were a professional.

What do the pros look for? Quality. Consistency. Dependability. They recognize that the least expensive element of tape recording is the tape. Buying cut-rate tape can blow the sound investment you've made in all your equipment.

Ampex has been the quality standard for tape recording since we perfected it in 1947. Men who make a living doing what you do for fun know that we demand the very top performance from our recording equipment.

AMPEX

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Same goes for all the magnetic tape we make for you.

SPECIAL TRIAL OFFER

We want you to try our tape on your system and we know that it will help if we sweeten the deal a little. So here's your spoonful of sugar: A coupon with each 7" reel of Ampex general-purpose or low-noise tape in the new 300-Series box entitles you to buy your choice of any one of nine exciting pre-recorded tapes at less than half-price: \$3.50. And the bank tape inside that Ampex box entitles you to create hours of great sound. Mono or stereo. Available wherever people demand the best.

20 YEARS OF HOME TAPE RECORDING

The year is 1948. In India, Mahatma Gandhi has just been assassinated. The communists have overthrown the government of Czechoslovakia. The United Nations is in the process of creating the new state of Israel and at the forthcoming Democratic convention in Philadelphia, some politicians, alarmed by the unpopularity of President Harry S. Truman, as reflected in the polls, are planning to dump him in favor of a glamorous wartime hero, Gen. Dwight Eisenhower.

It was the year of the New Look and the return of luxury goods to the stores. In St. Paul, Minn., a company which had made Scotch synonymous with cellophane tape was introducing a new type of tape — one with red iron oxide on it. And all of a sudden, the home tape recorder appeared in stores.

The tape recorder had been introduced the year before, when Bing Crosby began recording his network radio show on a Magnetophon captured from the Germans by Signal Corps officer John T. Mullin. Crosby had no sooner demonstrated the advantages of tape in radio broadcasting than the American Broadcasting Company placed an order for 12 machines, to be built by a West Coast machine shop, Ampex Electric Co. Hard on the heels of ABC's order came one from Capitol Records for two machines; and by the end of the year, every major broadcast and recording studio had a tape recorder. *Fortune* magazine was to point out, that it would be difficult to name another technological innovation that spread so far so fast as the recorder.

Not all the activity was in the recording studio, however. When Mullin showed his machine, there were some 17 firms producing wire recorders for home and business use, among them Wilcox-Gay, Stromberg-Carlson, Magnecord, Brush and others. None of these pretended to be high fidelity recording devices; they were intended as dictating machines and for simple recording around the home. By the end of 1947, four companies — Rangertone, Brush, Amplifier Corporation of America and Sound Recorder and Reproducer Co. — were also making tape recorders inexpensive enough to be purchased for the home. But these machines, too, were not really high fidelity instruments.

The trouble with Scotch's 111 recording tape was that there weren't enough machines designed to use it. One of the advantages of 111 was that

you could record at speeds as slow as 7½ inches per second and even 3¾ ips and get quality superior to the higher-speed recordings from a Magnecord wire recorder or Brush Soundmirror. So, to build a market for its product, Minnesota Mining & Manufacturing Co. sent teams of technicians around the country to visit recorder manufacturers and persuade them to manufacture and sell recorders which could take advantage of the new tape and would be priced low enough to appeal to the average consumer. By late spring, there were more than a dozen brands for consumers to choose from.

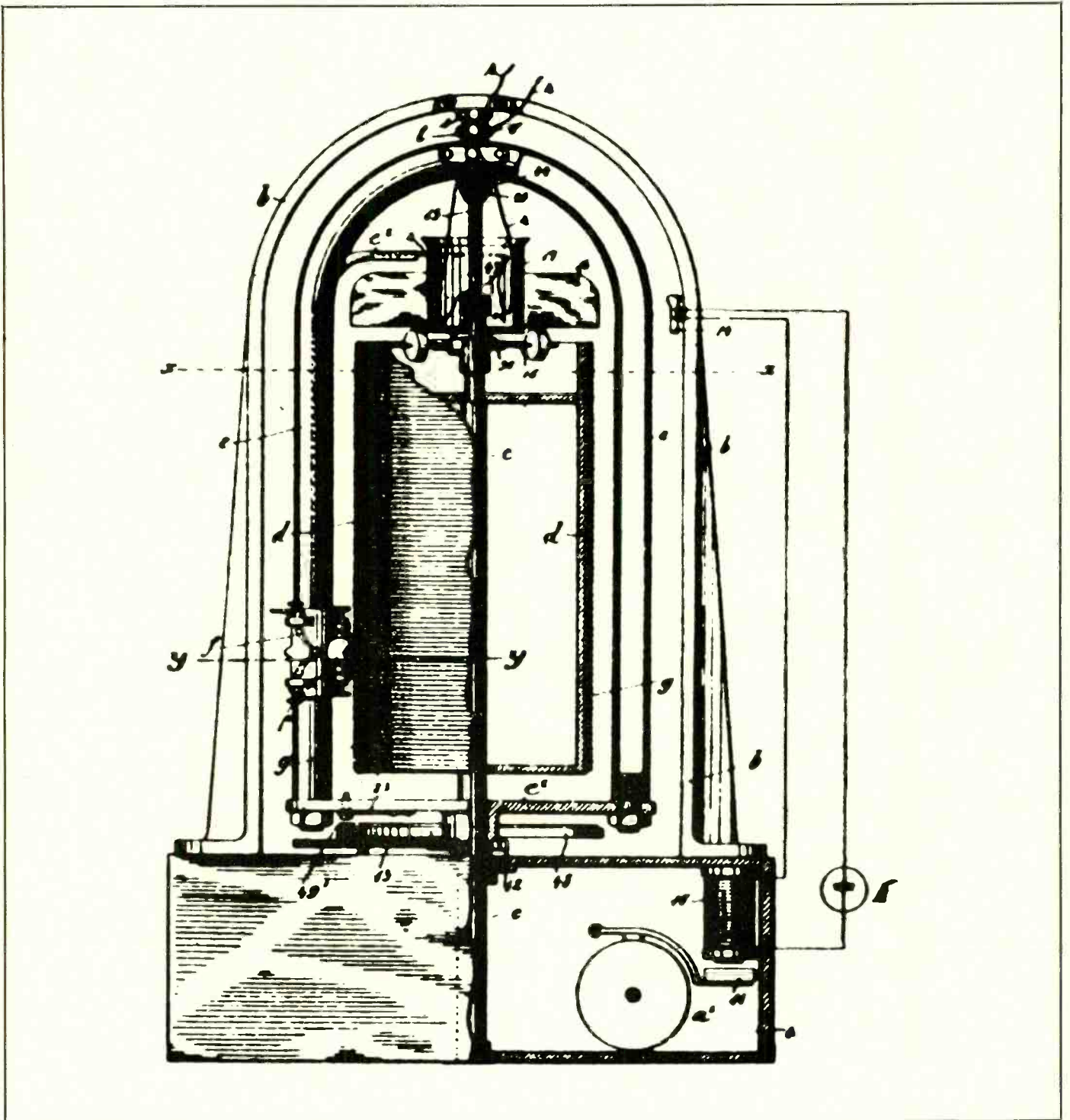
It is a matter of history that the tape recorder did not become a national sensation overnight. For these early machines carried price tags of \$250 at a time when bread was 12 cents a loaf and Congress was complaining because an average family's weekly grocery bill had climbed to \$9.83. Before tape recorders could capture the national fancy, the Democratic and Republican conventions burst upon the national consciousness through a new medium — television. Thousands of American males trooped to their neighborhood taverns to squint at a 12" screen on which Harold Stassen, Gen. Douglas MacArthur, Robert A. Taft and New York Governor Thomas E. Dewey were battling it out for the Republican nomination for the presidency.

During 1946 and 1947 sales of phonograph records had risen steadily despite their somewhat high cost. At the same time, some entrepreneurs realized, there were a lot of talented musicians out of work in war-torn Europe. So dozens of men equipped with nothing more than a tape recorder, a microphone and a few reels of tape, set out for Vienna and Stuttgart and Hamburg and Milan to go into the record business. When LPs appeared, Columbia Records was unable to supply the demand for virtually every type of music instantaneously. So labels like Period, Bach Guild, Concert Hall, Remington and Royale sprang up to fill the gaps.

This was the year which saw the creation of the first tape club. Wireresponse Club, which had been created by owners of wire recorders, switched to the new medium for convenience.

The new medium had managed to push out the old in less than a year — though it was to be another five years before newspapers and magazines stopped referring to "wire recorders" when they meant tape recorders.

It is a matter of history that the recorder did not become an overnight hit.



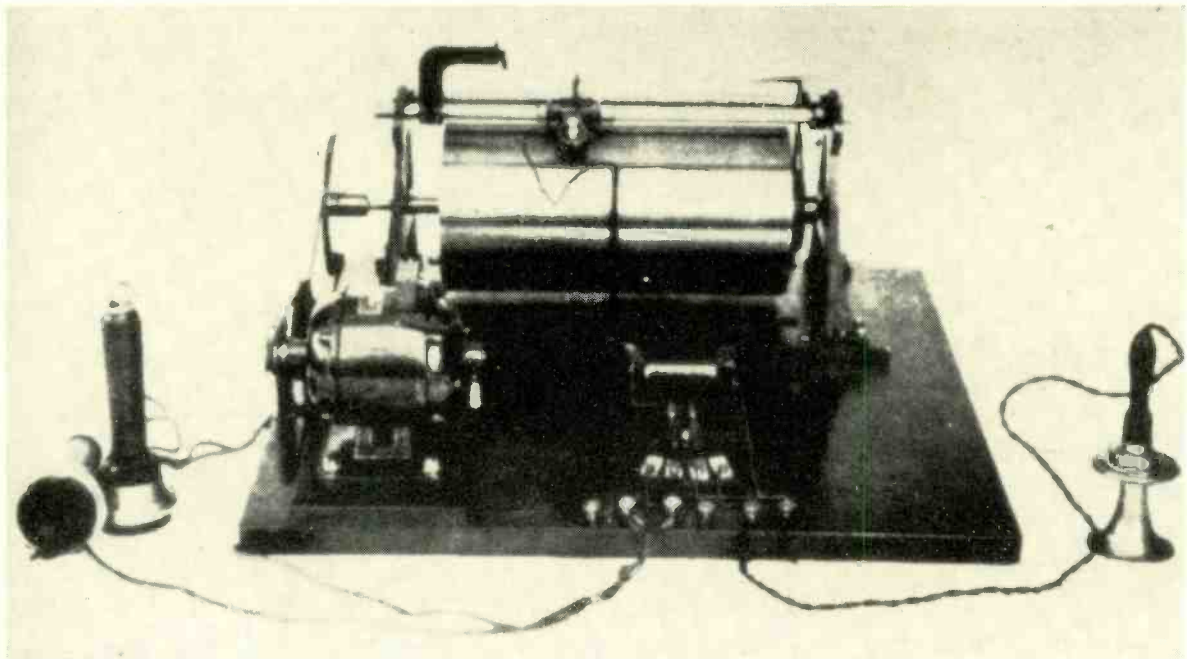
The first five years of home recording saw automatic reversing, battery-operated mono portables

Within the next two years, there was a frantic scramble to introduce new products and new ideas. By 1950, the home recordist could choose from among tapes by Scotch, Audio Devices, Fidelitone, Irish, Reeves, Brush Development and Indiana Steel Products. Or he could pick from approximately 33 recorders produced by 24 manufacturers, including Revere, Pentron, Webcor, Wilcox-Gay, and others. At this time, all of the machines sold to the consumer were monaural — and most were full-track units (unlike today's recorders, which can inscribe four separate sound tracks on a single piece of ¼" tape, these early machines utilized virtually the entire width of the tape for a single track). Even at that early stage, twin-track recording was not unknown; Amplifier Corporation of America had marketed its Magnetape Twin-Trax recorder as early as 1947 — a recorder which reversed itself automatically at the end of the reel.

As early as 1951, Bing Crosby Enterprises showed an Ampex recorder which could tape and play back pictures as well as sound; and two years later, RCA showed a color version of the videotape recorder. It was in May of 1951 that

Ched Smiley, a young man of independent means from Livingston, N.J. who was interested in tape and good music, took an early stereo recorder with him to the music festival in Florence, Italy. And it was about this time that another hobbyist and experimenter, Emory Cook lugged an Ampex out one rainy night to the New York Central railroad tracks near Brewster, N.Y. Smiley used his recorder to tape some of the first stereo recordings by a symphony orchestra; recordings which were the first to appear on pre-recorded stereo tape and today remain in the tape catalogue, as serviceable and as high in fidelity as ever. Cook's nocturnal efforts resulted in a (mono) high fidelity recording that was to stand the audio industry on its ear for several years running — Rail Dynamics, the first high fidelity recording of trains in motion.

By the end of 1952, there was enough activity among tape recorder owners and interest in new equipment to cause the creation of a magazine specifically designed to serve the tape hobbyist. Thus, under the editorship of Mark Mooney Jr., TAPE RECORDING was born. In our very first issue appeared the first advertisement for a bat-



The first magnetic recorder was this 1899 Telephonograph, which used piano wire instead of tapes.

the first stereo machines.

tery-powered portable stereo tape recorder. The product of Amplifier Corporation of America, it came with a crank like a windup phonograph (the motor operated on a steel spring) and a tube amplifier. It's only been in the past few years that stereo battery portables have reappeared — this time about half the weight of that early model and much more reliable.

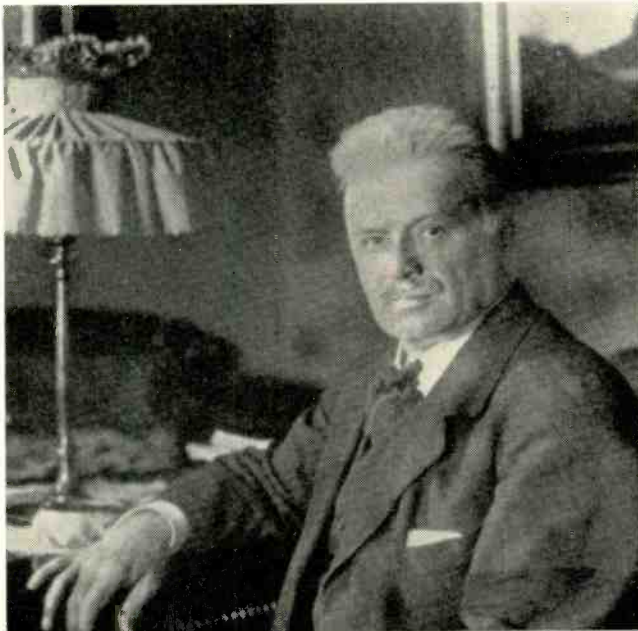
In 1953, the industry decided it had grown large enough to need a trade organization, and the Magnetic Recording Industry Association came into being at a meeting which took place at the end of the 1953 Audio Fair in New York. Joseph F. Hards became the association's first president and served four terms. MRIA was organized to provide standards for the industry, to promote public interest in tape recording and to inform people about the benefits of recording and listening to music on tape.

The stereo recorder which Smiley took to Italy seems like a jerry-built affair today, with its heads — one for the left track and one for the right — spaced 2¼" apart. Nevertheless, that's the way stereo was fifteen years ago, because nobody had learned how to combine the two

electromagnets needed for stereo into such a small area as a recorder head. Instead, two monaural heads were staggered along the tape, one placed upside down in relation to the other.

Then in 1954 came Mylar, the first polyester tape base, from DuPont. That meant longer-playing tapes and stronger bases and was used by the firms then in the field—Scotch, Irish, Reeves, Audio Devices, Bel-Cleer. This was also the year when George Eash began demonstrating an endless loop tape cartridge which could provide music in a car. The other big news that year was Audio Devices' introduction of colored tape. You could record one type of material on green tape, another on blue, and reserve ordinary brown tape for your more predestrain recordings. The idea never seemed to catch on, and Audio Devices quietly dropped it a decade later.

It was in 1954 that Ekotape announced a recorder which would operate a slide projector and the Mohawk Midgetape — the first really small tape recorder — appeared. V-M Corporation introduced the first of its Tape-O-Matic recorders and a conversion kit to provide stereo for its mono recorder.



Valdemar Poulsen (left) started it all with the Telegraphone. At right, an ad for an early recorder.

In the mid 1950s, everything seemed to be coming up roses for the tape recorder industry. It was selling some 300,000 recorders a year — a satisfactory portion of them suitable for playback of prerecorded stereo tapes. In fact, in 1956, there were only two ways you could enjoy stereo — by listening to an AM and an FM radio each tuned to one channel of a stereo broadcast; or on tape. Since the quality of AM reception was significantly below that of FM, tape offered the only really satisfactory way to hear stereo.

Among the big names were Webcor, V-M, Pentron, Ampex, Magnecord. In the educational field, university language departments were beginning to experiment with language laboratories — substituting the tape recorder for an individual instructor. The catalogues of prerecorded tape firms began to swell with non-musical material including courses in Mandarin Chinese from Phonotapes; university lectures from EMC; readings from the classics by Audio Books; drama, poetry and public speeches.

In 1956, Ampex stunned the broadcast industry by showing a videotape recorder which ran at 15 ips instead of the 100 ips at which other machines had run. CBS became the first network to use the new machine, for a delayed broadcast of Douglas Edwards and the News. It was the 1947-1948 story all over again. Ampex in short order was supplying all three networks and a host of stations with VTRs. In fact, according to legend, business was so good that the company had to turn down orders from two Texans who wanted to be the first in their neighborhood to own their own home VTRs. By the end of the year an increasing number of firms including Viking, RCA and Ampex were making stereo equipment or tapes for the home.

By 1957, head manufacturers had learned how to make stereo heads at a reasonable price, and a war developed between stacked and staggered. It didn't last long; most users found stacked, or in-line heads more convenient to clean and maintain; and the tapes they produced easier to edit. Even the standardization war couldn't cause gloom; recorder manufacturers, tape producers and accessory firms were enjoying their best year yet, and looking forward to an even better year in 1958. After all, wasn't the tape business good enough to attract the interest of giants like Victor, Columbia, Concert Hall and Mercury Records? And wasn't RCA already making raw tape and machines?

There were clouds on the horizon, but the in-



Pity this poor recordist! One problem with early recorders was tape spill—and this man has his hands full of Schubert's "Unfinished."

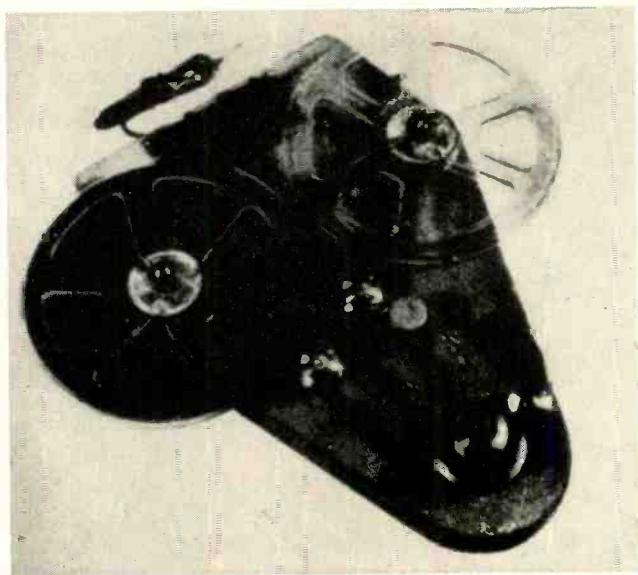


This Magnetophon, captured from Germans at end of World War II was first hi-fi tape recorder.

sales almost in half—from 400,000 machines in 1957 to less than 250,000 the next year.



Tape pioneer Howard Lindsay checks performance of an Ampex professional tape deck.



This Presto tape adapter converted record changers into mono tape decks in early 1950s.

dustry was too busy looking at sales figures to see them. There was, for example, the rumor that RCA had a new cartridge machine which would eliminate the need for tape threading, cut the cost of music on tape to less than that for records and thus attract the broad popular interest in tape which records so far had enjoyed. And, known to only a few insiders, there was a commercially practical stereo record in the laboratories of Westrex Co. and British Decca.

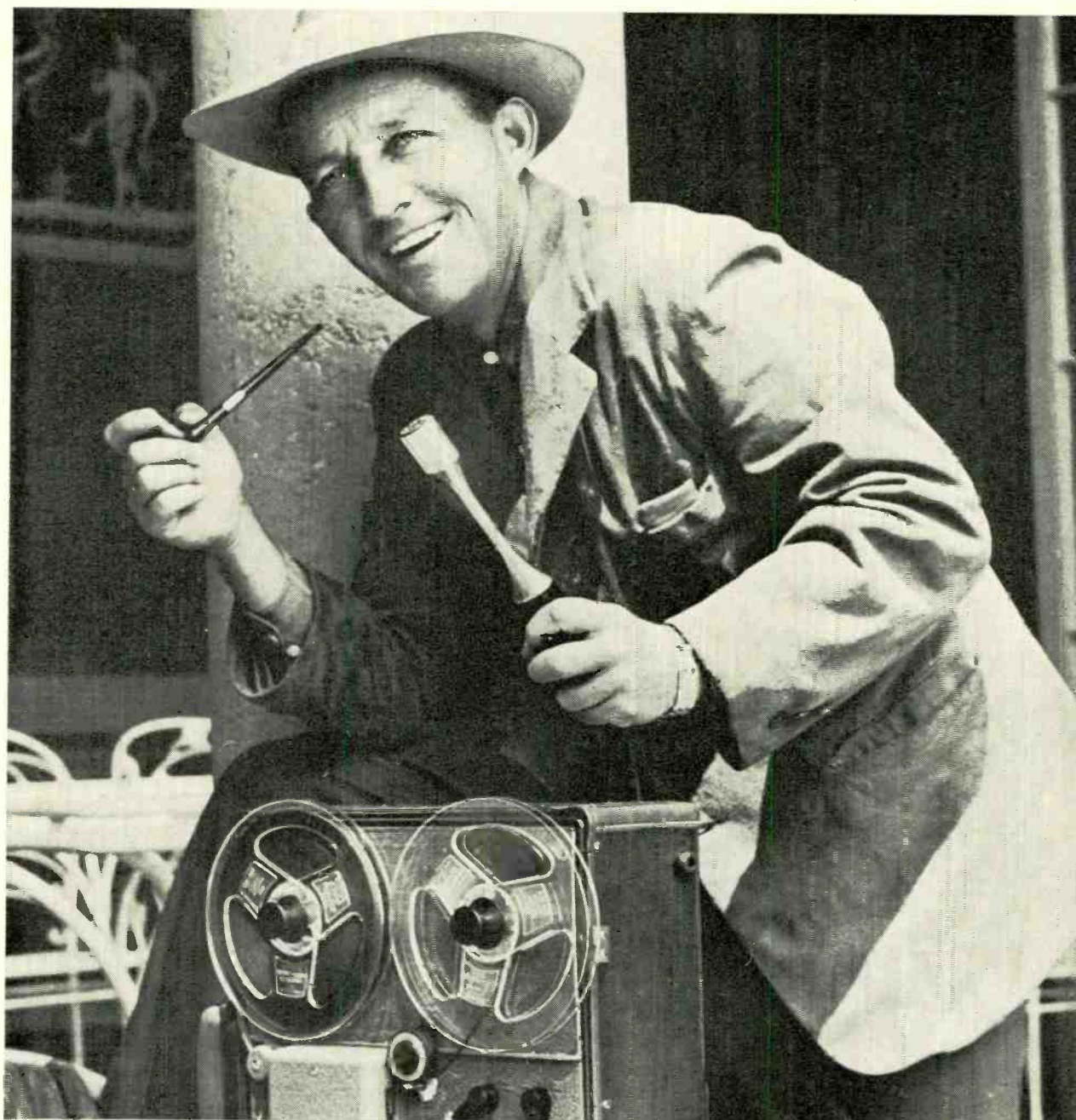
Toward the end of 1957 the bubble began to burst. Customers wanted to wait to see what Victor had to offer. When Victor finally unveiled its cartridge changer in September, 1958, consumers found that music would cost substantially more than records — almost as much as two-track stereo tapes.

The commercial stereodisc, which appeared the following spring, killed tape's monopoly on stereo and very nearly killed the tape recorder market. According to some reports, sales fell from better than 400,000 machines in 1957 to less than 250,000 the following year.

The Magnetic Recording Industry Association decided that something had to be done. Utilizing a four-track stereo head developed by Shure Bros., Association members designed a line of four-track recorders and prerecorded tapes to play on them. Ampex even formed its own tape duplicating subsidiary and signed up the biggest names it could find to make prerecorded tapes. The move was followed by Bel Canto, another prerecorded tape pioneer; and finally by Columbia and RCA Victor.

The "depression" year of 1958 saw the passing from the tape scene of several pioneers, and the radical alteration of the industry. For it was the year that Superscope introduced the Sony Stereorecorder, the first quality tape recorder to come from Japan. Within a matter of weeks, Lafayette Radio offered a Japanese low-cost stereo playback unit. At \$695, the Stereorecorder was considered the first really practical home stereo record unit. Other stereo pioneers of the period included Berlant Concertone, Bogen, Crown International, Tandberg, Norelco, Wollensak and Ferrograph. Stereo home recording and four-track tapes, it seemed, might save the industry.

Transistorized tape recorders and battery portables from Japan revolutionized the



Bing Crosby was first professional broadcaster to use tape, and became one of its earliest boosters. Bing Crosby Enterprises, in fact, became the first distributor for Ampex tape recorders.

recorder industry in the early 1960s.

The industry began to climb out of the abyss which had opened in 1958 the following year. American manufacturers still dominated the scene, and one — Telectro — was offering mono recorders for less than \$100. If you wanted a Tandberg or a Ferrograph stereo machine, the tab was likely to be around \$600. The Sony Stereorecorder had dropped to \$470, and a second line from Japan — Roberts — could provide stereo for as little as \$359. Nevertheless, the big sellers still included Ampex, Magnecord, Pentron, Wollensak, V-M and Webcor, with Viking and Bell supplying most of the nation's tape decks.

It wasn't until the fall of 1961 that tape recorders began appearing in quantity from Japan, and such American manufacturers as Pentron and Webcor found the competition tough. The Japanese offered tiny transistorized portables at prices down to \$29.95; and by the end of the year, the "toy" recorder — low-fi battery units, some of dubious quality and construction — had become a significant part of the business. At the other end of the scale, Sony Superscope and Roberts were offering several different models in a variety of price ranges and were joined by Concord. Concertone moved its production facilities to Japan that year.

That was also the year of the cellophane tape scandal. One West Coast producer found that cellophane was a much cheaper base material than acetate or Mylar, and began coating it with iron oxide. Unwary purchasers soon found that the resultant product absorbed moisture like a sponge, altering its shape and causing flaking. Cellophane was also inflammable. The tape disappeared almost as promptly as it had arrived.

It would be no exaggeration to say that transistors swept the inexpensive recorder field virtually overnight. Suddenly there were hundreds of brands and models of battery portables, all fully transistorized. But it wasn't until the fall of 1962 that transistors appeared in quality recorders. Sony led the parade with the Models 101 and 777-S4; Roberts, Eico and Norelco were quick to follow. By the following year, tube models were the exception rather than the rule. Thus tape recorders were more than a year ahead of the high fidelity component industry in taking advantage of the transistor.

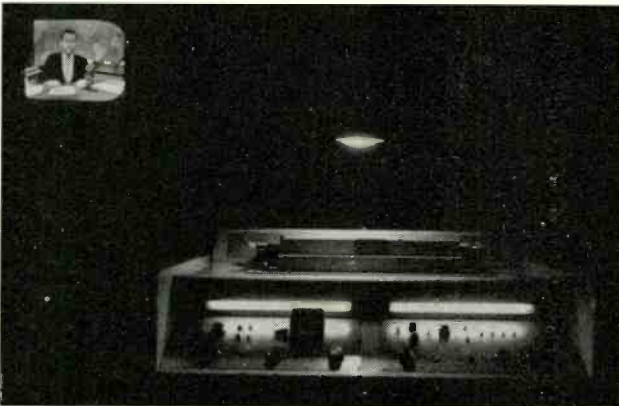
At the same time, there were other developments taking place. By 1964, it was clear that

the RCA cartridge concept would not survive — at least in the form in which RCA introduced it. As early as 1960, CBS Laboratories and Minnesota Mining held a joint press conference to discuss a new single-hub cartridge which could be stacked in a changer, like records. The industry shuddered; was a premature announcement of a cartridge player about to repeat the depression of 1958? For nearly two years, the 3M cartridge remained a rumor, until the fall of 1962, when the company introduced the Revere stereo cartridge player, \$450, complete with speakers. Cartridges, from Columbia, were to cost \$6.95.

By now, the popularity of moderately-priced stereo recorders was so well established that nothing seemed able to hurt. At just about the time 3M introduced its cartridge system, Roberts Electronics introduced the Crossfield head, developed by Marvin Camras of Armour Research Foundation and manufactured in Japan. The Crossfield head promised to permit high fidelity recording at slow tape speeds, thus cutting tape costs.

It was in 1961 that Concertone introduced the first reverse-o-matic tape transport since Amplifier Corporation of America's early effort. The Concertone S-505 featured four heads, three motors and the ability to record or play back in either direction for \$649.50. And it was in 1962 that the British Information Services revealed that a British firm had produced a recorder which could put pictures as well as sound on ordinary recording tape for \$180. The Telcan recorder duly appeared — and while its quality was poor and its production models never appear, it did spur Ampex, Sony and Norelco to market videocorders a year later.

FM multiplex — the system of broadcasting true stereo from a single FM station — became a reality early in 1961, replacing the awkward system of assigning the left channel to an AM station and the right to FM. Suddenly, there was plenty of good music in the air in stereo — and recorder owners quickly discovered that all they had to do to build a library of good music was to tape it off the air. Just how much of an effect FM had on recorder sales is anybody's guess. The decision by the Federal Communications Commission to settle on the system we use today climaxed more than three years of argument among engineers and lawyers. But there was more innovation to come in the years just ahead — videotape, cartridges and the cassette.



The Minnesota Mining Cartridge System (top) introduced in 1961, was withdrawn this year. (Center) Douglas Edwards' nightly CBS newscast was the first TV show to benefit from development at the Ampex videotape recorder in 1956. Ampex founder Alex M. Poniatoff (bottom right) discusses professional tape recorder with an associate in 1965.

By the summer of 1964, reports of low-cost home videotape recorders were flying thick and fast. Among the entrants were Loewe Opta, Norelco, Fairchild Camera, Sony and Par Ltd. For some reason — possibly because of the comparatively high prices or perhaps because Telcan had performed so badly — nobody got very enthusiastic about them. Sound recorder enthusiasts found prices still dropping and manufacturers offering such features as self-threading, automatic reverse, sound-on-sound, automatic level control at prices in the \$350-\$450 range.

Then in January, 1965, TAPE RECORDING assumed its new look and a new management team. The same issue reported the construction of what was claimed to be the world's largest laboratory for language learning at Friendship University in Moscow.

In March of that year, Nortronics announced development of an eight-track stereo head, a move which was to have important consequences in a few short months. It was in the summer of '65, in fact, that the cartridge developed eleven years earlier by George Eash came into its own. The endless loop cartridge had been used practically from the time of its invention for such chores as providing background music at supermarkets or restaurants; commercials for automated radio stations; and music on boats and yachts. But it took merchandising genius Earl Muntz to make it popular in cars.

The Nortronics head quickly found a place in an endless loop system being developed by RCA Victor and the Lear Jet Corporation. While Victor awaited the first shipment of Lear Jet players, Muntz continued to sell his four-track players in southern California, building up a large clientele. Nor did he have the field to himself. Others included SJB Electronics, Viking of Minneapolis, Telepro, Trans-World, Auto-Sonic and others.

As it had in the case of its earlier cartridge, Victor hinted that economies in eight-track manufacture would result in cartridges actually cheaper than records. When players finally appeared, they proved to be nearly twice as expensive as Muntz's with more technical problems; the cartridges themselves generally cost about the same as four-track.

Whether the public was now ready for tape cartridges, or whether it took the genius of an Earl Muntz to get them off the ground, suddenly everybody was talking about cartridges. Ford, General Motors and Chrysler all were offering

lighter, thinner, more professional looking and more stylish than the home recorders of 1948.

players as optional extras with 1965 cars, and across the country dealers were going into business selling nothing but cartridges and players.

Late in 1963, Norelco had introduced yet another cartridge type. Based on the 1958 RCA, the cassette was a miniature twin-hub affair only slightly larger than a book of matches. At first, nobody thought of it as a competitor to Muntz or RCA. It was a highly convenient portable recorder for taping classroom notes, providing music at the beach or recording sounds in the field. But Norelco showed how its Carry-Corder could be connected to a car radio to provide music, just like an endless loop cartridge. The trouble was that Norelco had no prerecorded music. RCA could point to Elvis Presley and the Boston Pops, Muntz had the Animals and the Lovin' Spoonful. The problem remained until Ampex, in mid 1967, provided its catalogues in cassette form.

At the moment, the cassette is still in the process of developing. Norelco has demonstrated an automatic changer — but it has yet to sell one. There are a few home stereo units around at premium prices. So far, the cassette has been most successful in the under-\$100 price range, where it bids fair to replace reel recorders in the years to come.

In many ways, the recorder of 1968 resembles those early home units. But there have been some differences. For one thing, today's recorder tends to stand up on its hind legs, while yesterday's lay in a supine position. The change from horizontal to vertical mounting isn't complete even today (and probably it never will be). But vertically-mounted machines began becoming popular in 1961 and 1962. In home installations, these machines took up less space than horizontally-mounted units. You could put it on a shelf or cut out a section of panelling and wall-mount it rather than bothering with pull-out drawers or taking up the top of a cabinet with it. But utility wasn't the real reason for the move to vertical units, in the view of one tape pioneer. "In the early 1960s, every tape hobbyist wanted to own a machine that looked professional or seemed to have a professional air about it. And everybody knew that professional recorders frequently are mounted vertically. That explains the initial popularity of the Ampex home units and the Roberts recorders, and others of the type which looked particularly professional."

Another step in the direction of "professionalizing" was the trend to VU meters on recorders. From 1948 until the early 1960s, manufacturers

used a number of devices for indicating recording volume level — cat's eyes, neon tubes and bulbs and in the better machines, VU meters in which a needle indicated volume level against a numbered scale. Several manufacturers of low-cost machines discovered that this was an inexpensive way to give their machines a professional look. In some cases, the VU meters were less accurate than the old neon bulbs, but they sold well. By 1964, some producers found that they couldn't sell a unit which didn't have a VU meter.

Tape recorders have gone on a reducing diet in recent years, too. Stereo recorders in the mid 1960s weighed less than some early mono models, such as the DeJur, the Crestwood and the Revere. Not only do some recorders weigh less, but they're slimmer as well. Take Wollensak's wall-mounted models, for example.

It was in 1965 that the Magnetic Recording Industry Association merged with the Consumer Products Division of Electronics Industries Association, a move which has had little effect on the average tape recordist. MRIA never properly recovered from the 1958-59 depression, although it was able to establish a standard of four-track stereo at 7½ ips. In the early 1960s, MRIA members were unable to set aside funds to do this kind of missionary work the Association was created to do. Also, it faced the problem of representing a minority of producers. MRIA's by-laws (and those of EIA) forbade importers to become members. Within a few years after they first appeared on the scene, companies like Sony Superscope and Norelco were accounting for substantial portions of the market, while sales of one-time big U.S. producers like Webcor, V-M and Pentron dwindled.

The problem was resolved beginning in 1966, when companies like RCA, Philco, General Electric, Westinghouse and others, who were already EIA members, began importing tape recorders from Europe and Japan themselves.

It was during this period, too, that the Electronic Industries Association of Japan (no relation to our EIA) moved to protect recorder buyers by requiring that manufacturers identify themselves by a code number inside every recorder they exported. The code number assured recorder purchasers of a place to go for parts or recourse in the case of defective machines. It succeeded in driving the poorest imports off the U.S. market and upgrading the products of other producers by making it too expensive for importers to handle shoddy goods.



When Minnesota governor Orville Freeman left for Europe in 1955, he took this 12-lb. battery-operated portable with him to record sounds, business conferences, dictate letters and reports. The young lady at right can do the same thing with 3-lb. cassette portable, shown in use in New York's Times Square.

As home recording starts out on its third decade, there are several developments worth watching. It seems reasonable to expect, for example, that by the time home recording celebrates its 30th birthday, recording pictures as well as sounds will be common. While we don't expect tape to replace records as an entertainment medium, it's likely that tape players in cars will be as common as car radios; and the portable tape player may well replace the portable phonograph and transistor radio as a medium of teenage entertainment.

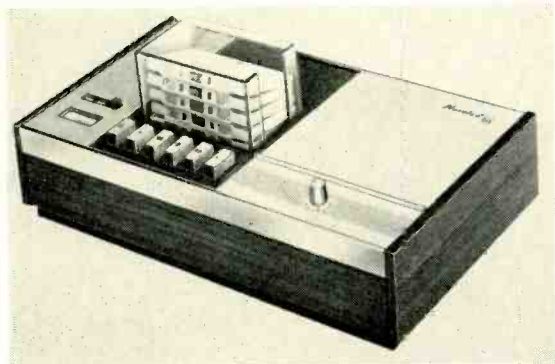
Home videotape recording has remained relatively static since its introduction because of the high price of machines — from \$695 to \$1000 for the recorder alone, another \$300 and up for a camera; and the high cost of tape. Even at these prices, recorders are being bought and used by educators for use not only in universities and graduate schools, but even in grade schools for basic science and remedial reading programs. Industry has cottoned onto the videocorder as well, for everything from studying industrial processes to interviewing job applicants and relaying management seminars from one branch office to another.

During 1968, at least two manufacturers will

offer videocorders in the \$500-\$700 range — one of them capable of recording and playing back in color. While it's unlikely that videotape prices will drop this year, it is conceivable that closed circuit television cameras could come down to more modest levels. The first HVTR based on the patents of inventor Chester Newell will appear later this year. The Newell process is designed to economize on tape to the point where it will be possible for hobbyists to build libraries of recorded videotapes, as they do now with sound tapes. Nobody expects home videotape to be an overnight sensation — after all, it took sound recording 20 years to get to its present stage of development.

Cartridges and cassettes, however, have become something of an overnight sensation since they first got the Big Buildup in 1965. As we've pointed out earlier, there was nothing really new about the endless loop cartridge when Earl Muntz discovered it. And the cassette can trace its parentage directly to the RCA Victor cartridge of 1959. Apparently, however, the time for these systems has come. Car owners have tried FM stereo and are ready for music of their own choosing. Teenagers want to take their own favorites to parties or picnics. Young adults find

her own tape recorder in the U.S., while in Viet Nam they're as common as the M-16 rifle.



The shape of things to come may be these automatic changers from Sony (left) and Norelco. Both are expected in 1968—the former to change tape reels automatically and the latter to change stereo cassettes. Auto changers could make tape more competitive with records. Notice compactness and attention to styling.

the cartridges and cassettes easier to handle than reels of tape.

Another portent of things to come was the announcement by E. I. DuPont de Nemours & Co. of a new type of recording material to replace iron oxide (see separate story on page 28).

But perhaps the greatest visionary is the man who sees a number of today's developments coming together to form a sort of super-tape recorder. For example: suppose we're able to improve the recording capacity of today's playback heads by such devices as a refinement of the Cross-field head, by ever-narrower gaps or by adapting the Dolby system of noise-reduction to home recording. Then suppose we use a super-low-noise tape of the type now used for professional recording, or a version of Crolyn with such a head. It might be possible under such circumstances, using today's technology, to make a cassette recorder which could perform as well as today's professional Magnecord of Ampex while occupying a fraction of the space.

Or suppose the same technology were applied to home videotape. It is conceivable that better heads and ever-lower-noise tape would make it possible to record pictures as well as sound on a cassette-sized unit, perhaps with tape moving

as slowly as $1\frac{7}{8}$ ips. After all, only 20 years ago, professionals had to make tapes at 30 (and sometimes 60) ips on machines at least as big as today's home videocorders — often with no better results than you can get on a good cassette recorder today.

In the meantime, the tape recorder has become an important means of communication for young people, as well as a medium of entertainment. CBS correspondent Charles Kuralt recently observed that the tape recorder was almost as ubiquitous in Viet Nam as the M-16 rifle. It's used for keeping in touch with the folks back home and may be responsible not only for keeping Viet Nam's PXs cleaned out of battery portables, but for some of the recorder boom back home.

Not only GIs but their girl friends back home are taking to tape. A survey by *Seventeen* magazine of its readers recently revealed that one in five owned her own tape recorder — and one in four had a tape recorder in the home. This is better than double the national average, and indicates that tomorrow's homemakers may be at home with tape as well as with records. Teenagers are making today's luxury — the tape recorder — tomorrow's necessity.

A GLIMPSE INTO TAPE'S FUTURE

Joseph S. Tushinsky, president, Sony/Superscope

As the entire world grows in both complexity and accelerated living, the need to communicate will multiply proportionately, resulting in a constantly growing trend for the spoken word to replace the written word.

Educators, for example, claim that tape libraries created by special teaching staffs will raise the academic levels of universities throughout the world, despite the apparent growing shortage of competent professors. These tape libraries will contain lectures by the world's foremost authorities, and will be made available to both individual students or entire classes. Supervision by full professors will no longer be necessary.

Medicine, too, has started to experience the value of the tape recorder. Many hospitals throughout the country provide a taped voice message at the bedside of each newly admitted patient. The message calmly explains hospital procedures and reduces the patients' fear of the unknown, a fear commonly associated with all hospitals. Soon, it will be possible to constantly monitor patients for more careful diagnosis by a doctor and reduce the amount of time they must spend in the hospital. Medical histories can be compiled, in the patient's own voice, for subsequent and immediate read-out by the doctor or laboratory assistant.

Personally, I can see the day when practically all music will be taped and available for instant selective recall into any home through a fantastically yet-to-be-developed system of tape storage and selective access — probably on a modest fee basis.



Sol Zigman, president, Irish Tape

The tape industry has made great strides in the past 20 years but the next 20 will see more innovations than we can even imagine today.

In 20 years everyone in the U.S. will have a tape recorder of some sort. Schoolchildren will find the tape recorder one of the greatest educational tools. The tape recorder will enable students to extend the learning process right into their beds with small units inside or next to the pillow. Today, schools are just beginning to learn the potential of video tape recorders. In future years much of man's knowledge will be condensed on easy-to-handle, no-thread videotape cartridges.

Video tape recorders will be compact and inexpensive and every home that has a television set will have a video recorder.

At one time we never believed tape could ever replace records. Now we think not in terms of tape replacing records, but of how tape will move ahead of records in its multiplicity of uses.

The use of spoken letters in the future will be tremendous. Today, taped letters are quite commonplace but in 20 years these little plastic containers will have tape letters which include both sight and sound! Loved ones will be much closer that way.

Our every day lives will be touched in many ways by tape 20 years from now. In fact, we'll wonder how we could have ever lived without those marvelous machines.



Five industry experts reviewing the tape industry's progress of the past 20 years offer some predictions for the future.



Frank Stanton, president, PlayTape, Inc.

The myriad uses to which miniaturized tape players and cartridges can be put have only begun to be realized — and, as these uses begin to take effect, they undoubtedly will continue to trigger other adaptations. Somewhat comparable to the paperback revolution in scope, tapes can bring a macrocosm of subject matter into availability in almost microcosmic form.

In addition to the vastly expanded libraries of all kinds of musical entertainment — from opera to whatever the current teen-age craze will be — works from the legitimate theatre, instruction records, all kinds of information tapes, and the varied approaches to “culture” not covered in other areas, we foresee a future where commonplace uses of tape cartridges and machines will include such things as

- *individualized courses' instruction for students (in school), geared to their mental agility as well as to their interests. This will permit the more intellectually advanced child to go at a more rapid pace — his own — without affecting others.*
- *time-saving tape cartridges for professional men and women — i.e. specifics of ethical drugs, along with tapes on new ideas for treatment, etc., reported and extracted from medical journals, for doctors . . . similarly oriented information for lawyers, law-makers, scientists, communications experts and the like — compilation and condensation of vital material which must be accurate, current, and readily available.*



Howard P. Ladd, president, Concord Electronics

The portable audio tape recorders of 1988 will be similar to today's product, but smaller in size with longer recording time and further improved sound quality.

For high fidelity music recording and reproduction, the recorders of 1988 will be compact cartridge units which will record and reproduce both audio and color video with high fidelity stereo sound. The program material will be recorded from a central “information computer” which will provide any type of program material, either for education on any subject or for entertainment. The material will be fed from the central storage bank into the home via coaxial cables similar to the telephone lines now available for every home.

By 1988 it is quite likely that conversion of the spoken word into the printed word will be achieved and communication by typewritten letters as we now understand it will give way to communications by voice which will automatically be recorded on an audio tape recorder and reproduced in visual form, either on a television screen or in written form when desired.

Tape systems will play an increasingly important role in our lives in the years just ahead.

**D. H. Boyd, General Sales Manager, Wollensak Products,
Mincom Division, 3M Company**

The tape recorder is coming of age on its 20th anniversary. Like many children it grew slowly at first, and then astonishingly fast. It wasn't until recent years that the recorder started to win acceptance. The extensive use of the recorder in schools, the introduction of the automobile player, the expanding use of "Living Letters" for communicating with loved ones, helped convince the public that it filled a real need.

As recorders won acceptance, they were improved. Recorders today have many convenience features which make them easier to use and enjoy. They perform much better than units only five years old. They are about half the price.

They also are better styled.

Engineers and technicians continue to be busy. Electronics and transports will be improved. Greater miniaturization will be achieved. More d/c equipment for remote use will be available as batteries are improved. It is probable that the cassette, or a similar type of recorder will replace the reel-to-reel for all uses except where editing is desirable.

Before another score of years is rounded out the tape recorder will be one of mankind's most popular and useful methods of communication.



You've read the statements of some of the industry's leading suppliers above. You can be reasonably certain their predictions will prove very accurate. Now consider some other possible uses of tape recorders. Think of a pocket tape machine that can do your bidding in ways unthought of today. You speak. The tape machine records your orders and transmits them to coded computers which carry out your commands. Example: You make up your grocery list but you don't want to go to the grocery store. You record the things you want and transmit the message to the local A & P computer by voice transmission of its code number through the tape machine. You have a complete record of everything you ordered because it's on tape. The food is delivered immediately because the bill is deducted automatically by computer tape from your bank account, via a coded transmission from the A & P to your bank. When your weekly taped bank statement arrives you can replay your taped orders for food and other merchandise against the tabulated tapes enclosed with your bill and, if they check out, you can erase the order tapes for later re-use. If they don't check out, your original orders are on tape — clear as a bell — to see to it that you get satisfaction. The same procedure holds true for department store purchases, clothing, pet supplies etc.

Think of a home tape computer that takes care of all your household chores. It wakes you in the morning, makes your breakfast, insures the desired degree of temperature of your shower, disposes of waste, cleans your home, maintains an alert against prowlers, turns lights on and off automatically, turns on your lawn sprinkling system, opens your garage door automatically, reconciles your bank statement, tapes all your phone messages for instant replay, tapes your favorite TV show while you're out, turns on your favorite music when you come home and much more.

None of this is Buck Rogers fantasy. Tape systems will play an increasingly important role in all our lives in the years just ahead. In 20 years time tape systems will be your greatest work — savers, your best communication tools and your best educators. And TAPE RECORDING Magazine will be on hand to document it and to help you get more pleasure and use from your tape system.

BEST TAPE VALUE EVER!

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- A FREE CARTRIDGE TAPE OF YOUR CHOICE WITH EVERY THREE** YOU BUY.

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- NO MEMBERSHIP FEE
- NO OBLIGATION—EVER
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Music sounds best on tape — and it's a sweeter sound when you save a third or more on every purchase. Order at home from the most comprehensive collection of prerecorded tapes available anywhere. No problems — ever. You order only what you want — when you want it — and pay the lowest prices with no strings attached.

The Variety Tape Club specializes in tapes exclusively to bring you the best buys in prerecorded tapes and tape cartridges.

With its concentrated purchasing power in the tape field, the Variety Tape Club offers you exclusive "super-special" discounts on

hundreds of titles from some of the world's biggest catalogs. For example, members of the Variety Tape Club will be offered "specials" featuring their favorite recording artists and music at discounts ranging up to 70 per cent. As a member, you can buy as many, or as few, tapes as you like — at any time! *You are never obligated to buy anything.* Satisfaction is guaranteed.

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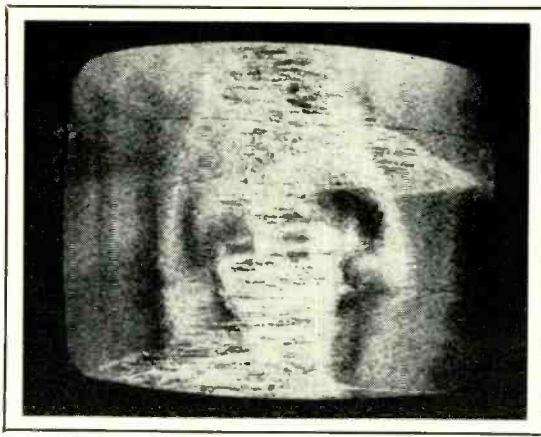
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Crolyn's slow-speed characteristics show up clearly in these photographs. Top picture shows image recorded on conventional iron oxide tape at 3 3/4 ips and played back at same speed. Next picture shows tape recorded and played back at half speed as it goes over splice between iron oxide (top) and Crolyn (bottom). Third picture shows image from Crolyn tape recorded at normal speed, while final picture shows Crolyn image on same recorder at the slower tape speed.



The S-l-o-w-e-s-t Tape In The West

When the Germans used magnetic tape to broadcast Hitler in hi-fi during World War II, the standard tape speed was 60 inches per second. In the years since, the standard speed for high fidelity recording dropped steadily — first to 30, then to 15 and eventually to 7½ inches per second. Now somebody's talking about a standard of 1⅞ ips with fidelity superior to today's 7½ ips.

The somebody is E. I. DuPont de Nemours & Co., which has been a major factor in tape manufacture practically since the beginning of home recording in 1948. If DuPont can produce a super-slow tape with high fidelity characteristics, it could cut the size of your home tape library by three-quarters and reduce home recording costs by as much as two-thirds. At the same time, DuPont hopes to cut the cost of home videotape recording by more than 25 per cent while increasing the recording time for a reel of videotape without sacrificing picture quality.

The magic word which DuPont hopes will accomplish all this is Crolyn — a recording tape which looks something like today's low noise tape (it's a black coating on acetate or polyester film). But, whereas low noise tape consists of thousands of irregularly shaped particles of iron oxide which can be magnetized to make up sound patterns, Crolyn is a coating of chromium dioxide. Chromium dioxide has magnetic properties similar to iron oxide, but unlike the latter, is made up of virtually uniform needle-shaped particles. The advantages of regularity are twofold: they can be aligned more easily into magnetic patterns, thus reducing background noise or tape hiss and they take up less room in a tape coating, making it possible to get more tape on a standard sized reel.

But don't rush down to your neighborhood tape dealer just yet. Crolyn at present is being used in computers and instrumentation recorders — and there only on a limited basis. DuPont is only now beginning to experiment with it in home videotape recording, and investigation of the audio market has yet to get under way in earnest. The first Crolyn audio tape, designed for use by recording studios and professionals isn't likely to appear until the end of the year and DuPont isn't talking about how long after that tapes for the home will become available.

DuPont doesn't expect to put iron oxide out of business. According to one company source, "Crolyn will have to cost from 20 to 50 per cent more per foot because of increased cost of manufacture. Thus the non-critical user will continue

to buy iron oxide." However, Crolyn has two properties which offset the increase in price. It can record high frequencies even at very slow tape speeds, and it reduces tape hiss almost to the vanishing point. Claimed result: you can pay 50 per cent more for Crolyn, then record as much as four times as much material on it (by utilizing a slower tape speed) without sacrificing frequency response or signal-to-noise ratio. Because of its ability to perform well at tape speeds as low as 1⅞ ips, it is already under serious study by some tape producers as a replacement for iron oxide tape in cassettes.

Recently, DuPont invited some 200 leading East Coast audio engineers to a demonstration of Crolyn in audio and video applications. Working with engineers from Sony Corporation of America, the DuPont men had converted a Sony TCV 2010 home videotape recorder from 7½ ips operation to dual-speed operation (7½ and 3¾ ips). A DuPont representative played back at standard videotape of iron oxide recorded at 7½ ips which showed a smiling model to advantage. Picture quality was good. Then the engineer stepped the recorder down to 3¾ ips and played back the same tape. This time the girl was hidden in a veritable blizzard of snow, and a flicker interfered with viewing. Switching back to 7½ ips, the engineer showed the same model, recorded on Crolyn. Picture quality again was good, with perhaps greater resolution in the background and greater stability to the picture. Switching to 3¾ ips, the Crolyn picture continued sharp and clear. The only loss appeared to be some of the clarity in the background.

Next, the men from DuPont turned to an Ampex audio recorder modified to produce optimum results with Crolyn. The test consisted of an endless loop of tape — half Crolyn, half low noise. The engineers recorded musical samples on the tape at speeds of 7½ and 3¾ ips and played them back. While low noise tape appeared to have a more natural bass and midrange, Crolyn's noise level was demonstrably lower; and its high frequencies sounded clearer.

The men from DuPont concede that modifications must be made in audio recorders to get the most from Crolyn. For one thing, it takes a much stronger bias current than that supplied in most home recorders to erase recordings already on the tape. However, DuPont feels that most good recorders can be altered to provide a stronger erase signal. For another, the advantages of Crolyn become most evident at the slowest tape speeds. At the moment, nobody knows

When the tape does become available, recording studios will get first chance to use it.

whether present recording curves found in home recorders are the best for recording on Crolyn.

When the tape does become available late this year, recording studios and cassette tape duplicators are likely to get the first crack at it. DuPont doesn't envision making any for you and me to use at home — at least, not now. "We can make more money selling it to industry for use in instrumentation and computers," a spokesman said candidly, "and we feel that duplicators and recording studios are likely to get the most out of it. Also, they can afford a more expensive tape." Is this simply an evasive way for DuPont to say that its Crolyn production facilities are limited? "Not at all. We can make all the Crolyn we need. We just don't see any major demand arising that quickly from home users."



But don't lose heart, home recordists. Minnesota Mining came out in 1964 with a striking new tape which it felt would revolutionize professional recording (it very nearly has). 3M at that time saw no home demand for its low noise tape, partly because it was thought that the premium price would frighten off home users used to tape bargains and partly because "the biggest advantages are in studio mastering and transfer, where the signal-to-noise ratio can be held to a satisfactory level." Within a year, 3M was marketing Dynarange tape to the tape hobbyist, who was able to offset its slightly higher price by recording at half the speed with virtually no appreciable loss in sound quality.

One of the reasons home videotape recording has been slow to catch on as a hobby is the high cost of tape. An hour's worth of tape for the Sony TCV 2010, for example, is \$40. Crolyn home videotape might cost as much as \$60 for a reel of similar size. But DuPont already has demonstrated that a \$60 reel can hold two hours' worth of pictures and sound — making a net reduction in the cost of videotaping to \$30 an hour, or a saving of 25 per cent.

Crolyn is not the only development to slow tape speeds while improving sound quality. Others include advanced engineering by KLH Research & Development Company to adapt the Dolby System of wide-range dynamic recording and noise suppression from the studio to the home recorder; the Newell system of high-speed tape duplication and videotape recording (reported in these pages in June). Should DuPont and KLH be successful, it's not at all unreasonable to expect the standard high fidelity recording speed to drop again — from 7½ and 3¾ ips to 1⅞ ips, perhaps even to 15/16 ips. Then a duplicating method such as the Newell system could produce thousands of copies of slow speed prerecorded tapes at a cost which truly would rival records in a fraction of the time it takes now, and with a quality equal to or superior to today's best prerecorded tape product.

Industry marketing executive John H. Trux has predicted that cassette-sized recorders will eventually produce truly high fidelity stereo recordings; may even be used for home videotape recording. TAPE RECORDING agrees and predicts that the technology displayed in Dolby, Newell and Crolyn will make further miniaturization and really slow-speed recording practical during the 1970s. One thing for sure: as new developments occur in the tape recording industry, you'll read about them in TAPE RECORDING first.

tape

REVIEWS

REVIEWERS: Richard Ekstract, Walter G. Salm, Fred Petras, Fred Romary, Matt Edwards and Robert Angus.

CLASSICAL

Bartok

Piano Concerto No. 3 and Ravel Piano Concerto in G. Julius Katchen with the London Symphony Orch. cond. Kertesz London LCL 80196, 7½ ips, \$7.95.

Music Performance ★★★
Recording ★★★★★

Each of these works has appeared on tape once before; the Bartok in a forceful performance by Geza Anda and the Berlin Philharmonic and the Ravel with Monique Haas and the French National Orchestra, both on Deutsche Grammophon. This listener finds Katchen's statement of the Bartok less convincing than Anda's, although Istvan Kertesz provides a masterful accompaniment with the London Symphony. The choice here may be a matter of personal preference. If you like Anda, you'll choose DGG while Katchen fans will stick to the new tape. In the Ravel, however, Katchen's artistry clearly outclasses Miss Haas, and he receives better moral support from his orchestra. Recording quality of all three tapes is good—but the new London seems to have less tape hiss than the older DGGs. Instrumental clarity is more noticeable on London, too. —R.A.

Beethoven

Piano Concerto No. 3 in c. Arthur Rubinstein, Boston Symphony Orch. cond. Leinsdorf. RCA Victor R85-1084, 8-track cartridge, \$6.95.

Music Performance ★★★★★
Recording ★★★★★

Tape cartridge manufacturers have not dealt kindly with the classical tape buyer. The record buyer can choose from among 22 performances of this concerto. If you own a reel-to-reel recorder, there are four versions to choose from. But if you're an eight-track cartridge owner, this recording is it. Not that that's so bad—

Rubinstein is a master of this music, and he receives warm support from Erich Leinsdorf and the Bostonians. Here is a lyrically beautiful performance which stands out even among those 22 versions on record. To top it off, there is the spacious sound of Symphony Hall typical of recent BSO recordings. Highly recommended.

The only demurrer—and it seems a small thing when you consider what the classical music lover has to choose from in cartridges—is the splitting of the first movement over two tracks, with that annoying click in the middle. Nevertheless, Victor has held the breaks to a minimum by assigning the Largo and Rondo to their own separate tracks rather than evening off the playing times of each track. Sound on our RCA Stereo 8 Player was as good as an equivalent-priced record playback system. —R.A.



Boston Pops

Stan Getz & Arthur Fiedler At Tanglewood. Includes: *Three Ballads for Stan; the Girl from Ipanema; A Song After Sundown; Where Do You Go?; Love Is For the Very Young; Tanglewood Concerto.* Getz, Boston Pops cond. Fiedler. RCA Victor R85-1082 8-track cartridge \$6.95.

Music Performance ★★★★★
Recording ★★★★★

Recorded live at Tanglewood, Mass., this tape has the usual technical shortcomings. The acoustics are a bit dead, and the intrusion of audience sounds can be a bit of a nuisance. Additionally, RCA's engineers have given Getz a larger-than-life perspective so that he oc-

asionally overpowers the orchestra. These shortcomings notwithstanding, this is an attractive tape. The major work, Eddie Sauter's Tanglewood Concerto, is engaging from beginning to end. Since the demise of the Sauter-Finnegan orchestra, little has been done with "Third Stream" jazz—a merging of classical and jazz idioms—but this tape may well mark its re-emergence. Alec Wilder also has written two shorter works for Getz, the three-part "Ballads for Stan" and "Where Do You Go?". All are attractive additions to Getz's already wide range of accomplishments. —M.E.

Julian Bream

Baroque Guitar and Bach Lute Suites: *Sanz- Pavanés, Canarios; Bach- Prelude in D Minor, Fugue in A Minor, Sor-Fantasy & Minuet; Weiss- Passacaille, Fantasie, Visee- Suite in D Minor. Bach-Lute Suites Nos. 1 and 2.* RCA TR 3-5014; 3¾ ips., \$11.95.

Music Performance ★★★★★
Recording ★★★★★

The classic guitar takes on a special kind of appeal and life of its own in Julian Bream's hands. Even works of obscure and recently resuscitated Baroque composers fare extraordinarily well. The Bream touch guarantees an impeccable and well-conceived performance.

The obscure names—Gaspar Sanz, Fernando Sor, Sylvius Leopold Weiss, Robert de Visce—all were champions of the guitar in their own time and have left us with a collection of rare gems for the solo guitar. The two minor Bach works, coupled with his two lute concertos make this double length tape a rare and delightful treat for all classic guitar lovers. —W.G.S.

Carl Orff

Catulli Carmina. Judith Blegan, Richard Kness, the Temple University Choirs and the Philadelphia Orchestra cond Ormandy. Columbia MQ 930. 7½ ips, \$7.95.

Music Performance ★★★★★
Recording ★★★★★

The incredible Ormandy forces have done it again in a magnificent reading of *Catulli Carmina*, called the successor to *Carmina Burana*, and the second in Orff's almost-legendary trilogy. The per-



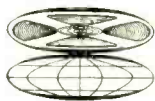
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formance is an exciting and flawless one, with the exuberance and enthusiasm that is so necessary to bring off a work of this kind. For this is no ordinary piece of musical art, nor is it a conventional choral work. Cast as a play within a play, much of the Latin dialogue is spoken rhythmically, rather than sung; yet the musical cohesiveness is never lost—a credit to the genius of Messrs. Orff and Ormandy.

Columbia's audio engineers have likewise done a highly commendable job in presenting the Philadelphians' scintillating perfectionism in a recording of superlative quality. This recording should become the definitive one, just as the Ormandy reading of *Carmina Burana* has become the one to own. Bouquets to Columbia for turning out a tape that excels in every category—they even included a reduced-size libretto in the box! —W.G.S.

Nilsson

Pandemonium Shadow Show. Includes: *You Can't Do That; She Sang Hymns Out of Tune; Sleep Late My Lady Friend; Ten Little Indians; It's Been So Long; River Deep-Mountain High; She's Leaving Home; There Will Never Be; Frekles; Without Her; 1941; Cuddly Toy.* RCA Victor 8-track cartridge P85-1272 \$6.95.

Music	★★★★
Performance	★★★★
Recording	★★★★★

One of the obvious shortcomings of cartridges has been that their physical size precludes much in the way of liner notes. No indication is given as to the nature of the music one encounters here. Whether Nilsson is the name of a group, or of the lead singer throughout the tape is not indicated, but the overall effect is almost overpowering. This is true "head" music (read: psychedelic-drug), with heavy use of reverberation and a multiplicity of electric guitars droning on and on. It sounds as if the whole thing was triply over-dubbed, and that the basic combo is small—an impressive confirmed by several tunes which are done by the male singer, and perhaps three instrumentalists. The kids'll love it. —M.E.

Saint-Saens

The Carnival of the Animals with Britten's Young Person's Guide to the Orchestra Henry Chapin and Leonard Bernstein, narrators; New York Philharmonic-Symphony Orch. cond. Bernstein Columbia 18-11-0044, 8-track cartridge, \$6.95.

Music	★★★★★
Performance	★★★★
Recording	★★★★

The most annoying thing about this cartridge is the two narrators. Master Henry Chapin, who explains the Britten for his less cultured contemporaries, is

an indufferable prig with a Freddie Bartholomew style which must be heard to be believed. On the remainder of the cartridge, Bernstein delivers one of his little music appreciation lectures (on the Saint-Saens) which lacks the wit and charm of Noel Coward's recording of Ogden Nash's verses, in his own inimitable style. If you feel you or the kids need a cultural uplift, this definitely is a must for your cartridge library.

The pity is that the orchestra plays well, with outstanding work from the youthful soloists and that there are no alternative 8-track versions of this charming music. On our RCA 8-track player, this cartridge seemed to lack bass and emphasize high frequencies—another pity, because the original record had a warm balance of sound. Columbia's 15-year-old recording by Coward and Andre Kostelanetz would be a substantial improvement on this "Carnival"—even with "electronically enhanced" sound. —R.A.

Soviet Army Chorus

On Parade. Includes *On the March, Rise Up Fair Sun, Oh You Lass. Song about the Headman, Cossack Cavalry Dance and six others.* Soviet Army Chorus & Band cond. Alexandrov. Melodiya Angel Y1840018, 3¾ ips, \$6.95.

Music	★★★★
Performance	★★★★
Recording	★★★★

Stereo must have been invented for the Soviet Army Chorus—or perhaps the Soviet Army Chorus was invented for stereo. Whichever way you look at it, this ensemble provides the perfect display piece for a stereo tape system. Here are the power of a mighty male chorus, the restraint of a pianissimo passage, the Chaliapin-like tones of bass Alexei Sergeyev and the bell-like tenor of Yevgeny Belyayev. The pieces are typical of the program the Chorus has presented on its various American tours, consisting mainly of folk tunes and an occasional operatic ensemble. Sound, even at 3¾ ips, is exciting. Strongly recommended. —R. A.

Verdi

Requiem. Galina Vishnevskaya, Nino Isakova, Vladimir Ivanovsky, Ivan Petrov, Moscow Philharmonic Orchestra and State Academic Chorus Cond. Igor Markevitch. Parliament/Ampex, PMC 154. 3¾ ips, \$7.95.

Music	★★★★★
Performance	★★★★★
Recording	★★★★★

This release is a remarkable recording from several viewpoints. First, it represents Ampex's initial Parliament entry—even though this tape's appearance follows the disc version by about six or seven years. It uses the new "enhanced" s/n technique that really does an incredible job of trimming down tape hiss and improving sound quality. The recording

dynamics, stereo separation, balance, fidelity—all the crucial technical factors—are almost so perfect, it's hard to believe that it's a slow-speed tape selling for half price.

Markevitch has done a herculean job in getting the Muscovite performers to follow his direction, but there's still that little something missing. The singers sound a bit too strained, especially in the difficult solo passages where Markevitch supposedly had the most success in getting his ideas across to the performers. For they still come through like the grandiose oversized, state-subsidized and subordinated group—too noisy, too overconfident, too smug. They still come out sounding like *Aida*, no matter what Markevitch may believe to the contrary. Even with these somewhat nebulous shortcomings, the overall performance and recording are excellent, and certainly a more-than-worthwhile buy at this bargain price. One usual Ampex "extra" that's noteworthy by its absence—no program notes or libretto. We hope this will be rectified for future Parliament releases, and that there will be many more of them of this caliber to come. —W.G.S.

Wagner

Lohengren Preludes to Acts I and III; Parsifal Preludes; Meistersinger Prelude with Liszt Les Preludes Vienna Philharmonic Orch. cond. Mehta London LCI. 80197, 7½ ips, \$7.95.

Music	★★★★★
Performance	★★★★★
Recording	★★★★★

"Preludes," London calls this delightful tape from Vienna. One can only wonder what can come after a prelude such as this. The idea for the program seems a little thin—the Liszt and Wagner works really don't go together very well. But if you want these works, you can't do much better in terms of recording or performance. Mehta has a lyrical, rather than dramatic approach to these works which comes off better in the case of Liszt than with Wagner who could, to this listener's taste, use more bombast. Nevertheless, the orchestra sounds full and rich, the works really sing and Ampex's EX + process has given us one of the quietest tape backgrounds this reviewer can remember. —R.A.





Walton

Symphony No 1 (1935) and Nielsen Symphony No 1 in G Minor, Op 7 (1892). London Symphony Orchestra cond. Andre Previn. RCA Victor 8-track cartridge R85-5052 \$9.95.

Music	★★★★★
Performance	★★★★★
Recording	★★★★★

This is one of the finest classical tapes released in 8-track format, with an unusually attractive program, well performed, and well recorded. RCA seems intent on matching Previn to Columbia's Bernstein. The parallels in their talents are striking: both are jazz pianists, both compose classical, jazz, and musical scores, and both are championing "new" music. Previn, however has tackled a more obscure range of works, and his success is therefore better deserved.

Although there are annoying track-changes in both works, this is a tape I wouldn't part with. In these days of access to FM radio in most large cities, it's a cartridge that counters the "standard repertoire" put out by most classical FM stations (which is all available on cartridge anyway). If you're buying this for automobile use, keep in mind that there are many quiet passages which'll be lost in all but the quietest cars. My VW all but ruined any hope of hearing it except at low speeds. Home use is another story, however. —M.E.

POPS

Herb Alpert

Herb Alpert's Ninth Includes *Trolley Song, Carmen, My Heart Belongs to Daddy, A Banda, The Happening, Bud, Love So Fine, The Love Nest, Flea Bag, and others.* A & M AMC 134, 7½ ips, \$7.95.

Music	★★★★★
Performance	★★★★★
Recording	★★★★★

The Tijuana Brass comes up with another winner, similar in sound, style and repertoire to his previous hits. If there is any criticism of this tape, it is that Herb Alpert's Ninth is a serving

not easily distinguishable from his eight preceding albums. Ampex has wisely offered this pop tape at 7½ ips (there has been a trend recently to offer pop music at 3¾ ips, and usually it doesn't make any difference. With the Tijuana Brass, it does). If you're an Alpert fan, you'll want this tape. —R.A.

Ed Ames

Time, Time. Includes: *Michelle; Something Stupid; Pretend; Here With You; Cabaret; Wish Me a Rainbow; One Girl at a Time; Love That Lasts; etc.* RCA Victor 8-track cartridge P8S-1239 \$6.95.

Music	★★★★
Performance	★★★★★
Recording	★★★★★

Originally one of the Ames Brothers, Ed has been on his own for several years now. His recent albums reflect a maturity of style and a suaveness in handling his material which he didn't possess for awhile after the breakup of the Brothers. The program is well chosen to show off his talents; the orchestrations are imaginative; and the recording fine. A winner of a tape. —M.E.

Ace Cannon

The Misty Sax of Ace Cannon Includes *When a Man Loves a Woman, Summer-time, Wonderland by Night, As Time Goes By, You'll Never Walk Alone, Strangers in the Night, Blowing in the Wind, Yesterday and others.* Hi HXX 52635 compatible stereo cassette, \$5.95.

Music	★★★
Performance	★★★★
Recording	★★★★★

When we reviewed the reel version of this cassette in August, we found it sexy and exciting—although we recommended listening to only one track at a time. Too much of sax with strings can be more

than the average listener can handle. Heard through the speakers of a cassette player the sound here is very good; it improves when fed through our audio system although it lacks some of the highs of the reel. The word "compatible" here means you can play this cassette either on monaural or stereo players with no loss in fidelity (though you get mono-only sound from the former). —R.E.

Ray Conniff

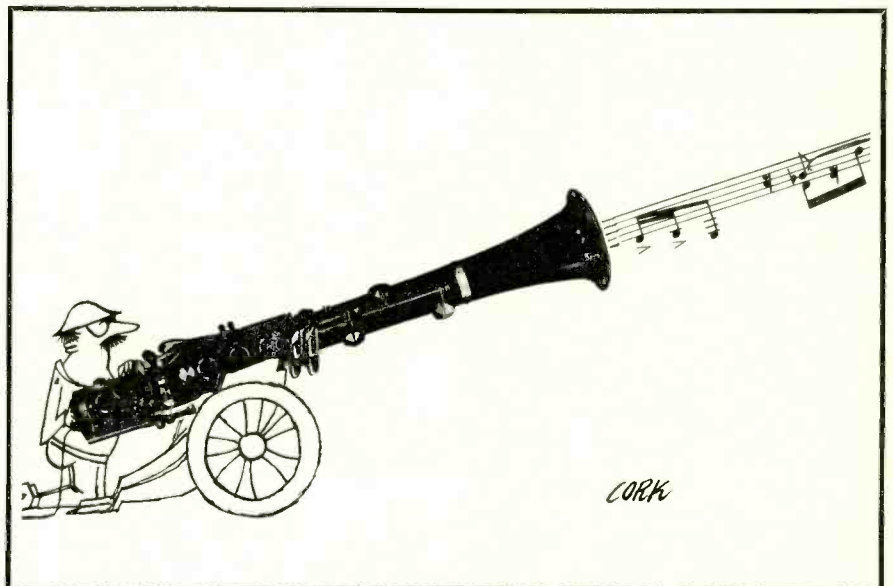
En Espanol. Ray Conniff Orchestra and Singers. Selections include, *Hi-Lili-Lo, Mam'selle, Taking A Chance On Love, Happiness Is, Invisible Tears, Days of Wine And Roses, Love Is A Many-Splendored Thing, Downtown, Dear Heart, Everybody Loves Somebody, Red Roses For A Blue Lady, Three Coins In The Fountain.* Columbia CQ 950, \$7.95. Recorded at 7½ i.p.s.

Music	★★★★★
Performance	★★★★★
Recording	★★★★

Chao Chao, which freely translated means downtown. And that's exactly where Ray Conniff headed, downtown Mexico City, to achieve an authentic flavor to the Spanish flavored standards on this tape. Not skilled at the Latin dialects, Ray managed to create a beautiful package by using just these five words, diction (diction), entonacion (intonation) and No estan juntos (It's not together), plus an abundance of musical know-how. The results shown in Happiness It, Dear Heart, and Red Roses For A Blue Lady. This package is by far one of Conniff's best efforts, but then most of his tapes are good anyway.

Bing Crosby

The Songs I Love. Bing Crosby with orchestra conducted by Mishel Piastro. Selections include, *Stormy Weather, Always, Ole Buttermilk Sky, Tenderly, Isn't This*



A Lovely Day, In The Chapel In The Moonlight, My Prayer, Anapola, The Breeze And I, Rock-a-bye Your Baby With A Dixie Melody, South Of The Border, I'll Take Romance, Lonesome And Sorry, When My Sugar Walks Down The Street, All Alone, Coquette, The Longines Symphonette 01673, \$26.76. Recorded at 3 3/4 i.p.s.

Music Performance Recording	★★★★ ★★★★ ★★★★
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This deluxe tape contains 84 melodies and comes complete with a bonus tape containing 12 additional songs. Only the songs listed above are sung by Mr. Crosby. All the rest are orchestrations by Mischel Piastro, noted classical conductor. If you enjoy mood tapes and enjoy music in a toned-down fashion although a full orchestra is present then this is your cream. Bing Crosby slides with ease through tunes he has never recorded, and believe me they are hard to find. The Groaner needs no cover over for he is in very good voice. Best vocal performance is Lonesome And Sorry, and the best non-vocal is These Foolish Things. A perfect tape for any library, especially for new audio-bugs basic shelves. The success of this tape in album form has been tremendous and Longines will soon push mikes in front of Bing again for another such go-around. Listening and dancing all the way. —F.R.

Folk Music

Carl Sandburg Sings His American Songbag. 51 American folk songs, including *Frankie & Jonnie, The Erie Canal, Blow the Man Down, Levee Moan, The Roving Gambler, etc.* Caedmon CDD 2025, 3 3/4 ips, \$14.95.

Music Performance Recording	★★★★ ★★★★ ★★★
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This is perhaps the most difficult tape we've ever had to review. On one level, it's a cornerstone of the library of any serious collector of folk music—both in terms of the program and of the authenticity of the performances. On the other hand, this is inferior Sandburg, likely to disappoint the less serious listener, in a mediocre recording.

Let's take the positive side first. Carl Sandburg's *American Songbag* is, without a doubt, the most important collection ever made of American folk songs, and Sandburg has proved in earlier recordings (his 1940s albums for Muscraft and Decca, both fortunately still in print on records) that he has the wit and ability to bring these songs vividly to life. There is a minimum of duplication between those collections and this, which is a fair cross-section of the book. Not since the disappearance of Pete Seeger's *Frontier Ballads* and other Folkways albums from the tape catalogues in 1958 has there been anything even approaching this tape in scope—nor is there likely to be. Tape has not done particularly well

by the serious folk music collector—though folkniks were among tape's earliest boosters. So it seems ungrateful not to be wholly enthusiastic about this tape.

It was recorded by an amateur at informal gatherings in New York in May 1952 and June 1953. Recording quality is quite good considering the circumstances, but not what we expect nowadays. Sandburg obviously was performing for friends; there is no attempt here to repair wrong chords or retake a song sung off-key. Above all, these performances lack the charm and verve of those Muscraft (now Lyrichord) and Decca albums. Thus we say how much you'll enjoy this tape depends on how serious a student of folk music or how great an admirer of Carl Sandburg you are. —R.A.

The Hollyridge Strings

The Beach Boys Song Book, Vol. 2 / The Beatles Song Book, Vol. 4. *The Hollyridge Strings with arrangements by Perry Botkin, Jr. and Mort Garson. Selections include, Good Vibrations, Caroline, No!, Sloop John B., Dance, Dance, Dance, California Girls, Little Deuce Coupe, God Only Knows, Wouldn't It Be Nice, Surfer Girl, Help Me, Rhonda, Be True To Your School / Strawberry Fields Forever, Eleanor Rigby, You've Got To Hide Your Love Away, Taxman, Good Day Sunshine, Act Naturally, Penny Lane, Yellow Submarine, Eight Days A Week, Drive My Car, I've Just Seen A Face.* Capitol Y2T 2807, \$7.98. Recorded at 3 3/4 i.p.s.

Music Performance Recording	★★★ ★★★★ ★★★★
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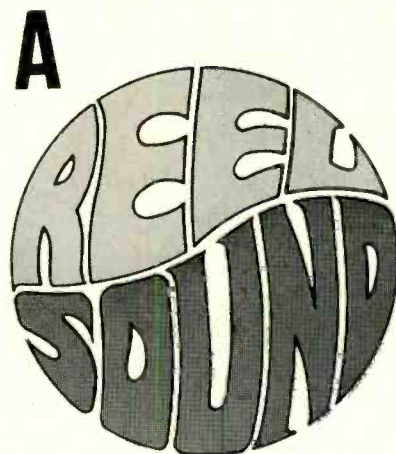
Two decades ago we were plagued by Japanese beetles, one decade ago it was the plight of the farmers and now, during the soaring sixties it's the London Beatles. Somehow we have weathered all three storms: with the first two about forgotten, we are left with a song log by Lennon and McCartney. We are also left with a package of tunes by Surfdom's number one group, the Beach Boys. All songs presented on this tape take shape as most pleasant listening through the efforts of a most talented group known as the Hollyridge Strings. They perform as in past tapes of the same kind of material with light frivolous excitement. A fine tape for those who fear discotheques and like today's sounds. Great for parties. F.R.

Major Lance

Greatest Hits. Includes: *The Monkey Time; Um Um Um Um Um Um; Come See; Sometimes I Wonder; Sweet Music; Ain't It a Shame; Hey Little Girl; Girls; Rhythm; The Matador; It Ain't No Use; Gotta Get Away.* Okeh 8-track cartridge K 18 10070 \$6.95.

Music Performance Recording	★★★ ★★★★ ★★★★
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Several of my favorites are on this tape, and though I'm not overly fond of the



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remaining songs, I've found myself returning to this tape again and again. The infectuousness of the quasi-calypso rhythms has a lot to do with it, and the repeated use of trumpet counterpoint gives them a very happy sound. —M.E.

Wayne Newton

The Best Of Wayne Newton. Including, *Summer Wind, Days Of Wine And Roses, Wiederseh'n.* Capitol YIT 2797, \$5.98. Recorded at 3¾ i.p.s.

Music Performance	★★★★
Recording	★★★★

In this psychodramatic age it's as odd as P. T. Barnum's circus was at the turn of the century to have a pleasant simple young balladeer just sing the songs the way they were written. Jack Benny's protegee Man-boy the Musician, presents each selection on this tape the way a mid-Westerner would present them if he were appearing at a fair or country picnic.

One visual bonus to this reviewer is not seeing the box marked Greatest Hits or Golden Goodies, expressions much overplayed by other artists for strictly commercial purposes. —F.R.

The Mormon Tabernacle Choir

The Old Beloved Songs. Including, *Annie Lauri, An Irish Love Song, All Through The Night.* Columbia MQ 916, \$7.95. Recorded at 7½ i.p.s.

Music Performance	★★★★
Recording	★★★★

When this world-famous choir under the direction of Richard P. Condie, strays away from the sacred hymns to do well remembered standards the results can be equally as rewarding. Here we are with a dozen pressed roses from grandmother's dairy, performed with the same reverence by the group as their spirituals, so that it is almost impossible to turn the tape off.

Tony Mottola

Guitar . . . Paris Includes *La Vie en Rose, Under Paris Skies, Dominique, Gigi, Mimi, Poor People of Paris, April in Paris, Michele, C'Est Si Bon, Comme Ci Comme Ca* and others. Command RS 4T 877, 7½ i.p.s., \$7.95.

Music Performance	★★★★
Recording	★★★★

It takes only a few minutes of listening to this tape to get the feeling that you've heard it all before. Here are 12 songs from about Paris which every American Francophile has heard hundreds of times. Tony Mottola's guitar arrangements are vaguely reminiscent of the late jazz guitarist Django Reinhardt and very reminiscent of his previous Command recordings. And the sound is the kind of super-clean stereo we're used to from Command. What, then, makes it a four-star tape? Perhaps the combination of all these sure-fire ingredients—good, familiar songs, beautifully recorded by a performer who is a pro in every sense of the word. A small group provides tasteful, unobtrusive backing. —R.A.

Ray Price

Danny Boy. Ray Price with orchestra under the direction of Grady Martin. Includes are *Danny Boy, Greensleeves, Across The Wide Missouri, Soft Rain, Pretend, Spanish Eyes, What's Come Over My Baby, Crazy, Born To Lose, Vaya Con Dios.* Columbia CO 949, \$7.95. Recorded at 7½ i.p.s.

Music Performance	★★★★
Recording	★★★★

Like Eddy Arnold and Jimmy Dean, Ray Price has been lucky with the crossover from country to popular music. Part of the secret in pleasing the masses is to keep a moderate portion of the Nashville Sound plus approaching the scorings with authority and sincerity. Some of his constituents would probably say "taint good, a country boy gettin' citified . . ." well we're glad he did this tape. Recommended especially are Greensleeves, Pretend, and Vaya Con Dios. Having Grady Martin, Noted arranger, conductor and guitarist on hand doesn't hurt either. In short this is a most successful venture and Ray should do at least one a year like it.

Soundtracks

In The Heat of The Night with Quincy Jones and Ray Charles *United Artists UA8T3025, 8-track cartridge, \$6.95.*

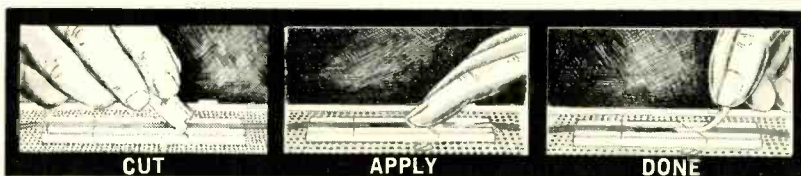
Music Performance	★★
Recording	★★★★

Themes from the James Bond Thrillers, Vol 3 includes *You Only Live Twice, Casino Royale, Dr. No, From Russia With Love, Goldfinger, Thunderball.* Roland Shaw Orch. London LEM 72137, 8-track cartridge, \$6.95.

Music Performance	★★★
Recording	★★★★

Great Motion Picture Themes Vol 2 includes *In the Heat of the Night, You Only Live Twice, A Man and a Woman, Gone with the Wind, For a Few Dollars More, Divorce American Style* and seven

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others. Various artists. *United Artists UA8T 1083, 8-track cartridge, \$6.95*

Music ★★ ★
Performance ★★ ★
Recording ★★ ★

For a Few Dollars More and Other Movie Themes includes *The Train, Zorba the Greek, Topkapi, Tom Jones, Aces High, Goodbye Colonel, Viva Maria* and others. *Leroy Holmes Orch. United Artists UA8T1086 8-track cartridge, \$6.95*

Music ★★
Performance ★★ ★
Recording ★★ ★

These four cartridges emphasize two things about movie soundtrack albums: they are the ideal thing to listen to when driving to or from work; and it is the rare movie indeed which has enough good music to sustain a full-length album. To put it bluntly, 32 minutes' worth of Quincy Jones' score for *In the Heat of the Night* is about 24 minutes too much. The helping on Great Motion Picture Themes is just about right. And anybody who has listened through the *Gone With the Wind* soundtrack albums waiting for the four-minute-long Tara's Theme knows what I'm talking about. If I had to pick one album from these four, it would be Great Motion Picture Themes, because of the variety of material (from jazz to Hollywood Romantic) it contains. Unless you really like movie soundtrack music, you'll find enough music from each of the films featured here to suit you.

However, for background listening particularly in the car, I think I'd want the James Bond album, too. The music is fun, perhaps a bit better played and recorded than on the other mixed cartridges, and provides a relaxing change from Great Themes. The Leroy Holmes cartridge leans rather heavily on those new Italian Westerns, which are more famous for their violence than for their music. Holmes shows us why. This is not a bad tape; the performances are average and the sound good. But the music is not terribly interesting.

For performances, Quincy Jones in the first cartridge gets top marks. Roland Shaw ranks second, and the variations from track to track in Great Themes ranks it third. Sound on all four cartridges is good, with London having perhaps a slight edge in clarity. —S.B.A.

Lovin' Spoonful

Do You Believe in Magic includes *My Gal, Wild About My Lovin', You Baby, Fishin' Blues, Other Side of This Life, Did You Ever Have to Make Up Your Mind, and others. Kama Sutra KSX 58050 compatible stereo cassette, \$5.95.*

Music ★★ ★★
Performance ★★ ★★
Recording ★★ ★

When L. F. reviewed the 8-track cartridge version of this album in June, he



found the singing and instrumentals fresh and original in their arrangements, and I would agree. I haven't heard the cartridge or prerecorded tape versions of this album, but compared to the stereo disc I'd say there is some loss of high frequencies and less stereo impact. On the other hand, the sound is very good, particularly through the speakers of a stereo cassette playback system. It should be noted that owners of monaural Carry-Corders and other cassette units can play this cartridge on their machines with no loss of fidelity. —E.B.

The Staple Singers

Why? Includes: *What Are They Doing?, If I could hear My Mother Pray Again, Move Along Train, Step Aside, King of Kings, I'm Gonna Tell God, etc. Epic 8-track cartridge N 18-10066 \$6.95.*

Music ★★ ★
Performance ★★ ★
Recording ★★ ★

The Staple Singers are among the foremost gospel groups performing today; and this collection of favorites will please any of their fans who up until now have been neglected by the cartridge-tape people. The material is sung with appropriate favor and feeling, and adequately recorded. —M.E.

The Tokens

It's A Happening World. Includes *Womoweh, Bye Bye Grandfather, For All that I am, Sunset See My Sadness, How Nice, Portrait of my Love, Gray City Day, Poor Man, etc. Warner Brothers 8-track cartridge 8WM1685, \$5.95.*

Music ★★ ★
Performance ★★ ★
Recording ★★ ★

Of all the rock groups, with the exception of the Beatles, I think the Tokens are

the most musically disciplined. Their harmonizing indicates at least some voice training, and the orchestrations indicate a high level of arranging competence. In fact, the arrangements are about the best around, ranging far wider than even the Beatles' Sgt. Pepper. The tunes display the Tokens' talents to best advantage, ranging from the hit "Portrait of My Love" to a modern "Wimoweh," and an exciting version of the title tune. In each, the singing is clear and the sound pickup well balanced. —M.E.

Various Artists

Exciting Performances of Monkees & Beatles Hit Songs. Includes: *Theme From the Monkees; And I Love Her; A Little Bit Me, A Little Bit You; Penny Lane; Words; Norwegian Wood; I'm A Believer; Yesterday; Last Train to Clarks-ville; Ticket To Ride; Pleasant Valley Sunday; Eleanor Rigby. RCA Victor 8-track cartridge P85-1277 \$6.95.*

Music ★★ ★★
Performance ★★ ★★
Recording ★★ ★★

This tape has no disc equivalent, and is made up of some rather good performances. In fact, it has a higher level of interest than most albums, since the change of performers from tune to tune helps alleviate boredom. The tempi and tones range from Al Hirt's staccato trumpet to the sugary voice of John Gary, to the country-piano of C Floyd Cramer. One of the better tapes this year. —M.E.

Jonathan Winters

Jonathan Winters' Mad, Mad, Mad, Mad, World includes *Oldest Airline Stewardess, Marine Corps, Used Pet Shop, My School Days, Prison Scene, Hip Robin Hood, Football Game, etc. Verve VTX 314, 3¾ ips, \$5.95.*

Material ★
Performance ★★ ★
Recording ★★ ★

There's an apt title for a tape, if ever we heard one. Whenever we're heard Jonathan Winters' night club routines, we had the feeling we were eavesdropping on a psychiatrist's session with a particularly fanciful and articulate patient. This tape is no exception, and to us it's not funny—a sort of latter-day visit to Bedlam, if you will (in the 17th Century, it used to be fashionable for London's aristocracy to visit the city's mentally ill in Bethlehem Hospital—a name later shortened to Bedlam. There, the inmates would provide a Sunday afternoon's entertainment by exhibiting their afflictions).

The laughs are few and far between on this tape, which apparently was recorded some years ago in front of an audience who was as embarrassed by the proceedings as we were. Sound quality is best described as murky; there is no stereo effect noticeable. —R.A.

By Eugene Walters

CONFESSIONS OF AN ELECTRONIC EAVESDROPPER

It was because of my tape recorder that I first stumbled into the world of bugs and wiretaps — what's known today as electronic eavesdropping. I'm sort of an electronic hobbyist and have a reputation in my area as a tape recording expert. The thought of using my equipment to "bug" others never occurred to me until one day a neighbor who suspected his wife of having an affair while he was off working asked me if I could install a wireless microphone in his bedroom. He wanted one that would broadcast an FM signal to my house (about 200 yards away) to be picked up by an FM receiver and recorded on my recorder.

While I declined any direct involvement I was able to show him how to do it and looked the other way when he asked to use my woodshed to house his equipment. Eventually, he and I began exploring the world of bugs and wiretaps more from the standpoint of intellectual curiosity than anything else. What we learned was more fascinating than any novel about undercover agents or even the ads published by some of the purveyors of electronic snooping devices.

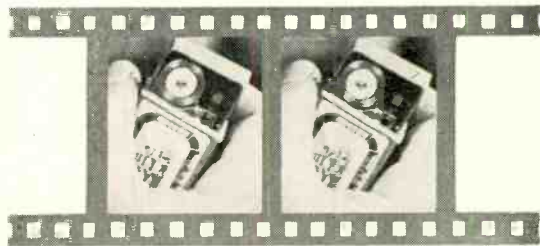
We got to know some of the people who actually design and produce sophisticated electronic anti-bug hardware as well as the bugs themselves. The stories they tell. . . . One company president told us, "Our sales (are) . . . primarily towards the governmental market. We have sold substantial quantities of our positive and counterintelligence equipment to governments all over the world. . . . the U.S. Government, and in particular African and Asian Governments, as well as some Latin American Governments.

"Our wireless microphones were used to gather evidence which resulted in the ouster of Mr. Juan Bosch as President of the Dominican Republic. . . .

"One particular Asian government that purchased a substantial quantity of our wireless microphones and wiretapping equipment last year, arrested more than 300 persons, considered subversive . . . the first week the equipment was put in use. The Minister of Defense advised (us) . . . that if they had not purchased our equipment . . . there was a good possibility the government would have been overthrown.

"An example of the use of our microphone locator relates to the United Nations Ambassador of an African government. The microphone locator was purchased by the embassy in Wash-





Heroine Susannah York learns that a matchbox can contain a battery-operated portable tape recorder in Paramount Pictures' new spy thriller, Sebastian. Tiny electronic eavesdropper appears in closeup at top. Miniaturization makes many types of electronic eavesdroppers practical.

There are bugs half the size of a sugar cube that sell for \$1000. As size goes up, price



Sebastian (Dirk Bogarde) discovers wireless microphone in wall of his flat and disconnects it as Susannah York looks on. Wireless devices are relatively easy to spot with detection equipment.

ington, D.C. and subsequently sent to New York to electronically search (their) properties . . . the security officer . . . discovered a wireless microphone hidden in the living room and bedroom of the U.N. ambassador's private apartment . . . many confidential conversations were held in his apartment and . . . (they) revised some of their policies and U.N. votes. This government subsequently purchased a substantial quantity of our microphone locators for distribution to their embassies and consulates all over the world.

"One of our commercial customers, a European automotive manufacturer, discovered a small wireless microphone concealed in their board of directors' conference room. This company now makes it a regular practice to search all areas where their executives hold sensitive conversations. Further, all of their executives have been issued one of our . . . telephone scramblers, which they must use whenever discussing sensitive information over the telephone."

Sound incredible? And this is just a *small* sampling from *one* supplier's experiences. Multiply these few samples several thousand times,

then multiply that by the thousands of firms and individuals all over the world who make this sort of equipment, and you'll shudder at the sudden realization that the age of Big Brother is here.

Eavesdropping devices can take many forms. Some old pros still swear by the tried-and-true (and old-fashioned) wire microphone, since these units do not radiate any kind of field that can be detected with any instruments (that we know of). They also do not need frequent attention for battery replacement, and this relieves this eavesdropper of having to make frequent housebreaking forays with fresh batteries — something a pro almost never does because of the likelihood of being caught in the act.

But a wired microphone requires a good deal of time and planning and involves a degree of permanence that may not be necessary. In the vast majority of cases, a bug is needed only for a day or two, perhaps only a couple of hours, and a semi-permanent setup just isn't called for. Besides, the eavesdropper may have only a few minutes time to locate and hide the bugs. Wired-in jobs take time.



Matchbox tossed so casually by Sebastian star Lilli Palmer (at right) contains a fully operational miniaturized tape recorder (left). The size helps determine cost of electronic surveillance devices.



comes down 'til you get to \$150 bargain basement models.



Conventional tape recorders may be used with electronic spy gear, as they are here by (at left) villainess Janet Munro and hero Dirk Bogarde. Recorders can tape wireless mike, telephone tap output.



The basic bug is simply a microphone and a flea-power FM broadcast transmitter. It can vary in size from the infamous martini olive on up to the cigarette-pack size of the most common types of wireless FM microphones, which can do double duty as bugs or as "body transmitters." A body transmitter is a more powerful device than would normally be stuck under a conference table with chewing gum, and usually is carried by an accomplice or by the eavesdropper himself. The person may be wearing a microphone wrist-watch, fountain pen, cuff link or other innocuous-looking item that houses a sensitive ultra-miniature mike. Somewhere on the premises or nearby is an accomplice with an FM receiver and a tape recorder. This accomplice may not even be human — just an attache case, again very innocuous-looking, that houses a battery tape recorder, a portable FM radio and a voice control activator (VOX) for the recorder. This is the basic setup for at least 90 per cent of all of today's eavesdropping operations.

The catalog of gadgets available to would-be electronic eavesdroppers reads like a page out of

a James Bond novel. There are bugs half the size of a sugar cube that sell for \$1,000 and call for a microscope for battery replacement. As the size increases, the price comes down, and for commercially available units, the basement level is about \$100 - \$150. There are telephone taps galore — especially since the telephone is probably the handiest device ever made for eavesdropping.

Then there is another category called "bumper beepers" and a variety of other names — radio beacon transmitters that fasten onto the inside of an automobile bumper with magnets and permit a chase car with the right kind of receiver to follow the target car through the most torturous traffic and natural hazards without arousing anyone's suspicions. Two chase cars can triangulate on the "beeper" pinpointing it with an accuracy of about a half a city block.

Telephone taps show possibly the highest level of ingenuity today and have reached astonishing levels of development. Gone are the long hours of vigil spent in a damp basement with a pair of uncomfortable black bakelite headphones clamped on tightly, listening to nothing, waiting for his quarry



Matchbox recorder has potentially harmless uses in addition to espionage but high cost keeps it out of hands of most innocent users. It is light, easy to operate, compact and unobtrusive as shown.



For all the sinister motives for using electronic eavesdropping equipment, there are plenty c

to pick up the telephone and tip off the location of his still.

The wireless telephone tap has done away with pole-climbing operatives and the VOX-switched tape recorder has eliminated the long vigil. In fact, it's possible for Ness' modern counterpart to have a dozen or more phone taps running concurrently, all serviced by a single agent. All he does is go around to each individual listening post, remove the used reel of tape, put on a blank reel and check to see if the batteries in the receiver and tape recorder are okay. He can make these rounds once a day if the suspect is moderately active.

There are several kinds of phone taps that the present-day secret agent can use. The simplest ones are induction pickups that can be installed in the base of the telephone or alongside the telephone line. Many of these devices use their own battery supply to transmit an FM radio signal whenever the telephone is in use. An FM receiver within the tap's transmitting range, plus a VOX-switched tape recorder, flash out the complete setup. If it's not possible to replace the batteries on a tapped telephone at regular intervals, other types of taps connect directly into the phone line and use the telephone company's own electrical power. This kind of device can operate indefinitely, but is a lot easier to detect because of the power drain on the telephone lines.

The device broadcasts an FM signal using either the nearby telephone line as an antenna, or an antenna of its own. One such device looks very much like the transmitter cartridge that falls out of the telephone handset when you unscrew the mouthpiece — in fact to the untrained eye it's a dead ringer for it. It operates the same way a telephone transmitter does electrically, but it also contains a little radio transmitter that broadcasts any conversation to an FM receiver that's located within one or two hundred feet of the telephone line.

A device called the "ultimate" in snooping devices and being marketed for around \$1,000, supposedly permits the user to eavesdrop on a bugged room from distances up to several thousand miles. Supplied as two pieces, the bug end of the device must be installed in the telephone in the room that is under surveillance.

The investigator or whoever else he may be, can dial the bugged telephone's number from nearly any point in North America that has direct distance dialing. He must listen carefully for the telephone switching relays to finish their search and connections. Before the first ring sounds on

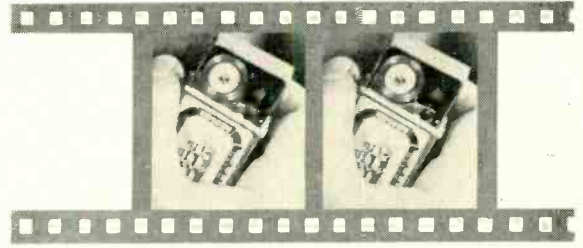
the bugged telephone, he presses a button on his half of the bug, which transmits an electronic tone over the telephone, activating a reed relay in the gadget at the other end. This interrupts the circuit and prevents the telephone from ringing. He can then listen to whatever is going on in the room through the unit's built-in microphone. The connection is broken when he hangs up. And all this at the telephone company's expense, not to mention the poor guy the bug is planted on! We are not sure if this device actually works unflinchingly, although it has been shown to us as black boxes — shown to us but not demonstrated. It certainly seems technically feasible, although there are telephone company people who claim otherwise.

For all the sinister motives that might prompt the use of electronic listening devices, there are plenty of perfectly sound business applications also. One is simply taking down detailed information on the telephone. What better way to take intricate messages than to commit them to tape? It certainly is a lot faster and saves on telephone bills than doing it the old-fashioned way with pencil and paper.

The voice-operated (VOX) tape recorder in an attache case along with an FM radio can likewise be used for perfectly legitimate purposes, such as recording interviews with hospitalized accident victims who would be reluctant to speak if they knew that their statements were being taken down. The interviewer can leave his attache case in the corridor or at the nurse's desk and relay the entire proceedings with his body transmitter. Insurance company investigators frequently use this technique, particularly with nervous witnesses.

Aside from international espionage, police cases and divorce proceedings, the biggest single user of eavesdropping equipment is industry. It seems that everybody in industry wants to spy on everybody else — and they are willing to spend sizable sums of money to do it. Many use the simple, direct approach such as placing a secretary in a critical position with a competitor. The only way a competitor has of safeguarding himself against such "plants" is to put a tap on a suspected secretary's telephone. Nine times out of ten he's got to listen to a lot of nonsensical female chatter without a nugget of spy stuff. But that tenth time! There are many other classic cases of perfectly legitimate, although not very innocent uses of telephone taps by business and private citizens; perhaps simply to check up on their own staff's operations, or to find out who's making those long-distance personal calls and

legitimate uses.



not paying for them, who's pilfering from the warehouse and to find out just what a teenage daughter is up to with that hippie crowd she's hanging out with. Trouble is, often the people who'd rather be safe than sorry and use these listening devices end up sorry anyway — they find out that trusted employees, associates, wives and "innocent" teen-age daughters aren't all that they seem.

Probably the ultimate in undetectable bugs is the device planted in the Great Seal in our embassy in Moscow. The story got plenty of splash in the press and understandably so, since this was an eavesdropping device so ingenious that no conventional methods of detection were able to find it. The way it was located ultimately was through piece-by-piece dismantling of the entire embassy interior.

The device was wireless with a *non*-radiating microphone. The microphone was simply a flexible metal diaphragm mounted on a metal cylinder cut to specific resonance dimensions. Attached to this cylinder was a long tube of waveguide that terminated just the right length for a particular microwave frequency. When the Russians wanted to listen in, which was most of the time, all they did was point a sharply focused microwave beam from their building across the street. The reflected wave pattern that they received with their special equipment would be altered (modulated) by the vibrations of the diaphragm in the resonant cavity. It was a device that reached new heights in snooping ingenuity. Scuttlebutt has it that embassy officials knew the place was bugged quite some time before it was physically dismantled, and purposely fed the Russkies a pile of false information. Sure, they knew there was a bug in the room, but just where and how were the big questions. Perhaps there's a moral to be read into this tale — the same type of device was developed independently in the United States at about the same time, and was used, not for bugging, but for medical research. It seems nobody in the medical laboratory working on this project ever dreamed that such a device could be used to invade his neighbor's privacy or for any other ulterior purpose.

For every bug, there is an anti-bug of some kind. There are radiation detectors that run the gamut in frequency coverage and price. Detectors start at about \$70 and can run to \$1500 or more. The high-priced jobs have been used to ferret out all kinds of wireless bugs; and telephone scramblers are in strong demand throughout the world to protect sensitive phone calls. The

scrambler is the only truly effective way to beat a telephone tap. It electronically alters the telephone conversation into a senseless garble that can be decoded only by a special coded electronic circuit at the receiving end. For this reason, scramblers are usually sold in pairs with matching electronic codes which can be changed at any time. On special order, scramblers can be ordered in large groupings—say a dozen or more, all with the same core—for top management personnel who must travel extensively. This is especially crucial if you stop to consider the number of potential points that are possible for listening in on an overseas telephone call. This is where tight security really becomes essential to big business.

There are numerous detectors on the market for telephone bugs as well, but these aren't always effective unless the tap is the type that uses telephone company power. Then all you have to do is measure line current. The other types of taps — the ones with built-in batteries — are harder to find. By the time you do unearth them, chances are the batteries are dead anyway. For the snoopochondriac, there are oscillators and jamming devices of various kinds, all designed to baffle the eavesdropper and provide the uneasy telephone user with some measure of reassurance.

Where is it safe to talk? Even in a room that isn't bugged you may not be safe. If a window is open, a heads-up eavesdropper can point his parabolic reflector microphone at you from a distance of 400 yards or more and hear every word you are saying. If you have the window closed, he might have one of those new experimental laser jobs that detects the vibrations of the window pane (which acts as a microphone diaphragm) and decodes these vibrations into audible speech. You can't even be safe in a public or company rest room, because even these can be bugged to catch malingerers and listen in on employee conversations to find out who's robbing the company.

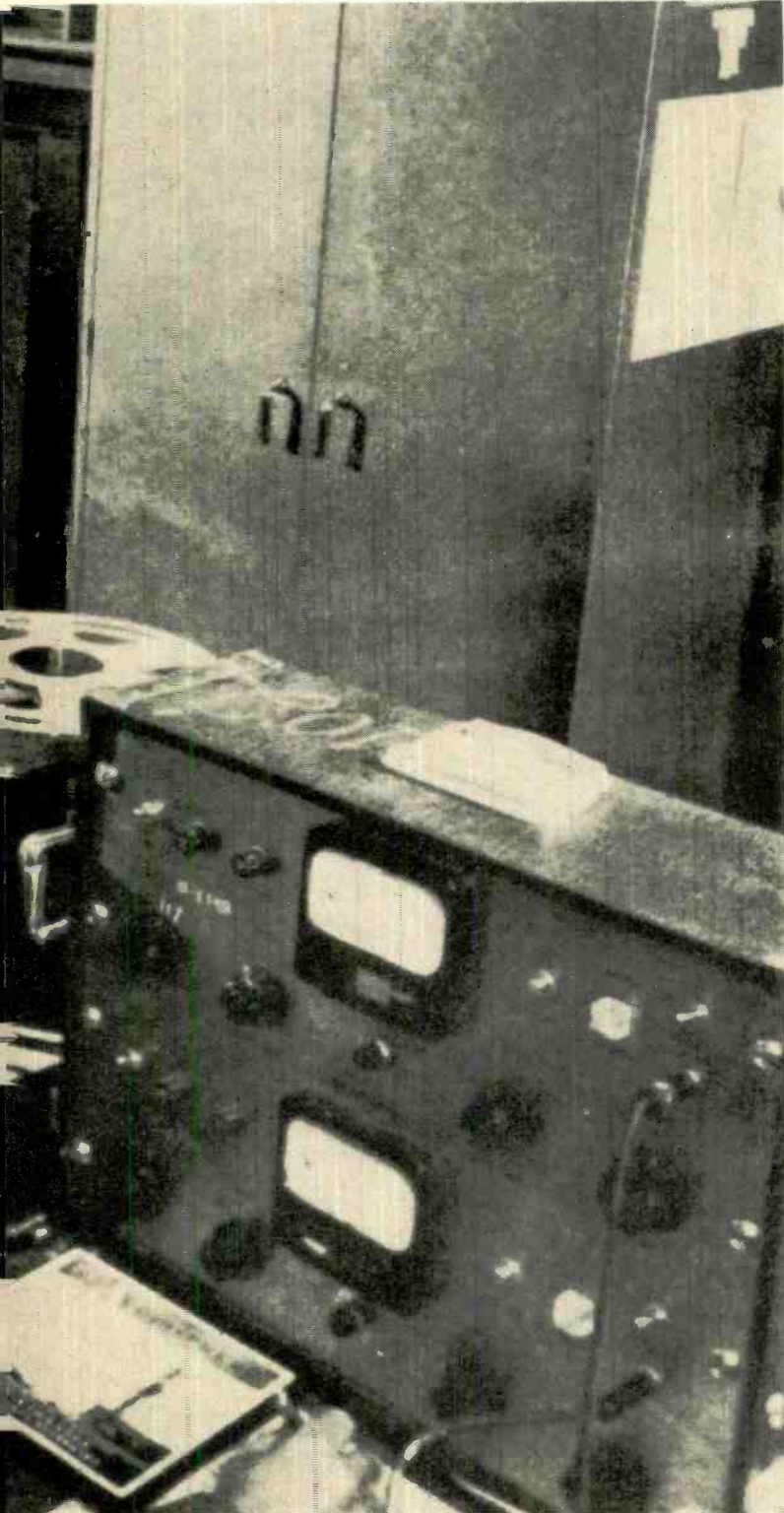
In many locations the listening devices are supplemented by seeing devices. Closed-circuit TV cameras are relatively small and can be secreted behind an opening hardly larger than a pinhole. At this rate, George Orwell's 1984 may be a reality much earlier than he predicted. Soon, perhaps no place on the globe will be safe for conversation. And all this while the whiz kids continue to pile more and more stones on the grave of our personal privacy. How long can we afford to just look the other way?

THE STORY OF MUSIC ON TAPE



Livingston's Ched Smiley (right) times first prerecorded stereo tape session.

Prerecorded tapes didn't get started for three years after the home recorder.



I suppose you could say that the story of music on tape started one day in 1935 when I. G. Farbenindustrie assembled a symphony orchestra in a concert hall in Ludwigshafen, Germany. For the occasion, the company had hired the services of the late Sir Thomas Beecham for a concert before an audience which included the major Farben officers, engineers, scientists and officials of Telefunken, Siemens & Halske and other German industrial giants, and broadcasting officials.

The concert which Sir Thomas conducted was to be recorded on Farben's Magnetophonband, or magnetic tape, with the aid of a recorder developed by Telefunken. It was believed to be the first time a symphony orchestra had been assembled for such a purpose.

The concert drew little attention outside Germany, and for more than 15 years, music on tape remained a sometime thing. True, when the home recorder boom started in 1948, there were many who predicted that within the foreseeable future, tape would replace records as a medium of home entertainment. Heavy, breakable, bulky 78 rpm records were the prime music medium then; and tape certainly offered advantages in cost, storage, use and handling over them.

But before anybody got actively into the business the long-playing record came along. It offered unbreakability, ease of handling, compactness — and economy — over tape, and it wasn't to be until 1951 that the first prerecorded tapes appeared on the market.

One of the first to explore the idea of taped records was Charles Rynd. Rynd had been a vice president of the American Broadcasting Company when John T. Mullin demonstrated his German Magnetophon for Bing Crosby. In 1948, he left ABC to become the eastern distributor for Ampex and by 1951, he was ready to announce his first catalogue of eight titles — a single sheet of pops and classics recorded in mono and selling for \$11.95 for 30 minutes' worth of music.

Rynd was joined almost instantly by Concertapes and Hack Swain — the former a library of chamber music recorded by the Fine Arts Quartet (who were, in effect, Concertapes' owners); the latter a collection of pop organ favorites recorded on the Hammond by a Florida-based entrepreneur. Selling their wares mainly through the pages of TAPE RECORDING, these three found that existing record companies were reluctant to lease their music or permit their artists to record for prerecorded tape. So, in the fall of 1951, you had to be satisfied with the keyboard artistry of Swain, the repertoire of the Fine Arts Quartet or A-V's Son-dra Bianca or the Lewis Williams Orchestra.

At just about this time, Ched Smiley had packed up an Ampex he'd modified by adding a second recording head for a trip to Europe. Smiley

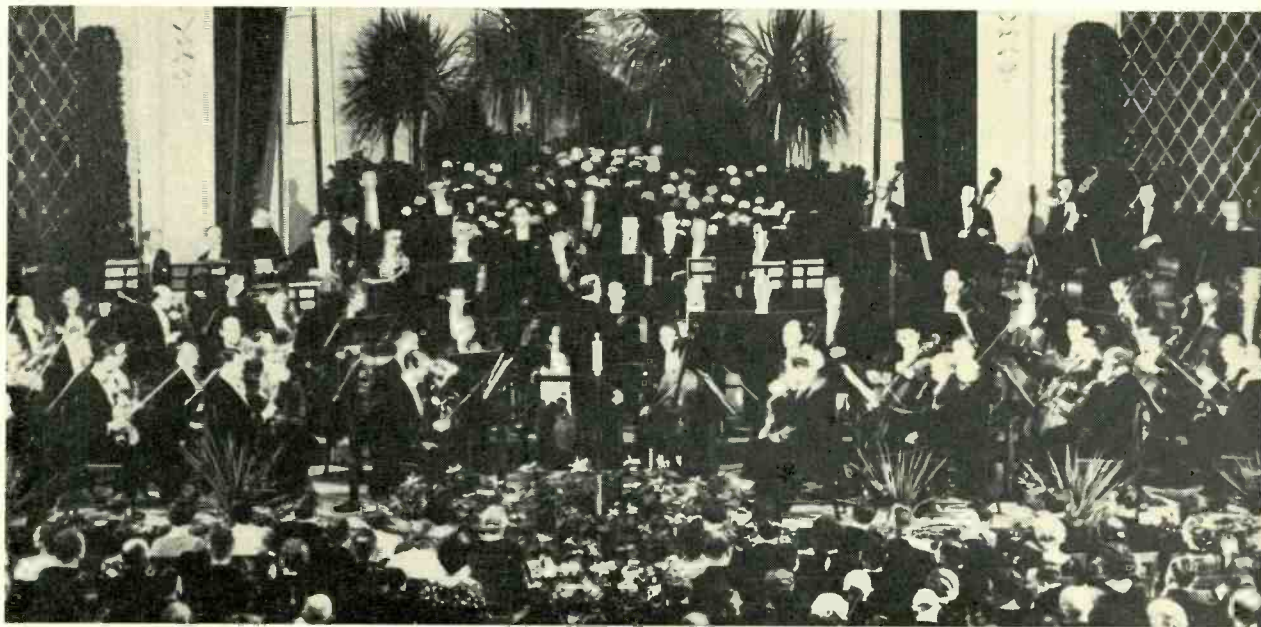
Stereo on tape was not an instant success, though by the mid 1950's more than a dozen



Norelco's Wybo Semmelink introduces cassette.

received permission in Florence to record the May Festival Symphony Orchestra under its conductor Vittorio Gui — probably the first stereo taping session of a symphony orchestra. Among the selections he recorded were Schubert's Unfinished Symphony, the William Tell Overture and a couple of Wagner overtures. Later, on the same trip, he met a freelance impresario, Dr. Hans Wolf, who set up recording dates in Vienna with a chorus and a pickup orchestra. At the time, Smiley, an audio hobbyist, was considering going into the record business; by early 1954 he found that tape was his proper medium. In May, Smiley released his Florence and Vienna tapes in stereo — the first pre-recorded stereo tapes ever.

Stereo on tape was not an immediate success — though Smiley's mono versions (on his Livingston and Audiosphere labels) were popular. In the next two years, more than a dozen labels were to join the parade — including RCA Victor, the first big record company to acknowledge the existence of tape. Smaller record firms were cooperating with tape, too. Haydn Society's classics were made available by Berkshire; Folkways' spoken word and folk music by Phonotapes; Bach Guild's Bach by A-V, Period's jazz on Livingston, and so on. Among the smaller record companies producing their own tapes were Elektra (Dynatapes), Westminster (Sonotapes), and Hifitapes. Besides Phonotapes' extensive library of prose and poetry, there were Gregg's courses in dictation, EMC's language courses, and college lectures.



Sir Thomas Beecham conducts German orchestra in first-ever tape-recorded performance, 1935.

more labels appeared on tape.

When Columbia and Mercury joined the tape parade at the end of 1956, it looked as if tape might really be getting ready to replace records. After Livingston's stereo lead, other companies — Mercury, RCA, Phonotapes and finally A-V — introduced their own two-track stereo tapes on the basis of 30 minutes of music for \$11.95. By mid 1957, you could choose from the catalogues of a substantial number of record companies — Vox, Period, Riverside, Cook, Oceanic, Esoteric, MGM, Fantasy, Philharmonia, Omega, Bel Canto, WEB, Audio Fidelity, to name a few.

For almost a year, tape buyers could choose from almost as wide a selection as there is today (though admittedly the name artists were few and far between). Then came rumors that RCA had a new cartridge which would render reel tape obsolete. The RCA cartridge would have not only the advantages of price and convenience, but would feature Victor's stable of artists — Eddy Arnold, Elvis Presley, Mario Lanza, the Boston Pops, the Boston Symphony and others.

The result was that production of tapes by the Hamburg Philharmonia and Hack Swain ceased. Lenny Herman and the Mightiest Little Band in the Land, the biggest seller in prerecorded tapes in 1957 was stone cold dead in the market in 1958. When the Victor cartridge system did arrive, it failed to live up to its backers' expectations—and prices were only slightly lower than for stereo tapes.

During the summer of 1959, members of the Magnetic Recording Industry Association met in Chicago to decide what to do. Ampex realized that unless people could buy prerecorded tapes featuring major artists at a reasonable price, sales of stereo recorders would suffer. So the company formed United (later Ampex) Stereo Tapes to solicit major record companies for tape rights to their catalogues. Meanwhile other manufacturers agreed to standardize on the quarter-track 7½ ips format for prerecorded tape.

The first label actually to market a four-track stereotape was HiFiTapes, which introduced George Wright at the organ for \$7.95. Shortly thereafter, UST announced that it had signed up London, MGM, Vox, Westminster, and others. Bel Canto soon had Mercury, Dot and Liberty under its wing, and Columbia and RCA introduced original cast Broadway shows and the Boston Symphony to four-track reels.

From that time to the present, the trend in reel tape sales has been upward, with a constant growth not only in numbers, but also in the selection available to the tape collector.

Back in 1954, inventors George Eash and Bernie Cousino, working independently, came up

with the idea of putting a reel of tape inside a plastic shell. If you joined the two ends of the tape and wound it upon itself, you could eliminate the need for threading which made tape seem so complicated to so many. Cousino and Eash both envisioned this endless loop cartridge as the solution to the problem of getting music of your choice free of commercials into your car.

Nothing much came of the idea for several years. Some independent manufacturers did try selling the Eash cartridge system for use on boats, licensing music from MGM for the purpose. The RCA cartridge came and went, to be followed by a system developed more or less jointly by CBS Laboratories, Armour Research Foundation and Minnesota Mining. The 3M cartridge was neither a twin-hub nor an endless loop system, but a reel of tape fixed firmly to the hub that rewound automatically when it finished playing. If the RCA system had the advantage of Victor's stable of artists (plus those provided by Bel Canto), the 3M system had the Columbia catalogue plus the music of ABC Paramount, Westminster, MGM, United Artists and several smaller labels.

But the 3M system was no more able to catch the public fancy than the RCA system had been. For almost two years, the idea of cartridges lay dormant. Then, virtually from nowhere, the Eash cartridge system sprang to life, this time under the aegis of Earl "Mad Man" Muntz, who began selling players for cars and music provided by ABC Paramount and MGM (the companies who were to lead the way in subsequent cartridge configurations) and their subsidiary labels. By the middle of 1965, Muntz and his competitors had lined up most of the independent labels which meant anything in the pop music field. Specializing in music merchandising was International Tape Cartridge Corporation, headed by former record executive Larry Finley and partly financed by Audio Devices. In mid 1965, only such majors as Victor, Columbia, Decca, London and Capitol had failed to commit themselves. The reason was a development by Lear Jet Corporation and RCA Victor of an eight-track cartridge similar in operation and outward appearance to the four-track cartridge.

ITCC and Muntz might have the Lovin' Spoonful, the Animals and the Tijuana Brass, but RCA had not only its own artists this time, but also those of Capitol and Columbia. Muntz responded by cutting the prices on his players and tapes, and to supply the demand in southern California for four-track cartridges of the Beatles, Chet Atkins, Bob Dylan and other teenage idols, bootleggers set up shop in garages, turning out unauthorized cartridges to fill orders. The business became so big

that the record industry cracked down hard, bringing some operators to trial. Columbia and Capitol decided that they were missing too many four-track sales by remaining exclusively in the eight-track camp, and capitulated at the end of 1966. Ampex Stereo Tapes decided to have the best of both worlds, as ITCC and Muntz were already doing by issuing best sellers in both four and eight track versions.

In the midst of the battle between four and eight, Norelco introduced its miniaturized version of the earlier RCA twin hub cartridge. The Norelco cassette didn't start out as a record substitute, as the other cartridge systems had; but events in 1966 and 1967 forced the machine



Two endless loop cartridge types are represented by the Borg-Warner Stereo-8 car player (at top) and Playtapes' model 1310 battery-operated portable carry-along tape player.

makers to think of music in cassettes if they hoped to sell large numbers of cassette recorders. Norelco's parent firm, Philips, also owns Mercury Records and had a substantial interest in a tape duplication firm—circumstances which would seem to put Norelco on virtually equal footing with four and eight track. The trouble was that Mercury had no Beatles or Chet Atkins or Tijuana Brass in its stable of artists, and other record companies were reluctant to deal with it. Since Norelco's duplicating affiliate was the only firm in the country equipped to make prerecorded cassettes, a bottleneck developed.

Ampex moved to break the bottleneck in the summer of 1967 by making such artists as Frank Sinatra, Mantovani, the Rolling Stones, Joan Baez and its classical lineup available in cassettes. The trouble was that at press time, Ampex still couldn't process its own stereo cassettes.

A final entry developed toward the end of 1966 in Playtapes, a miniaturized endless loop cartridge. Playtapes began by aiming frankly at the teenage market with a low-cost low-fi player and cartridges priced at \$1.29. During 1967, the company upgraded with new, better sounding players.

Of the four systems contending at the end of 1967, three were playback-only. Some record company executives admitted openly that their firms would like to block any system which permitted the buyer to do this own recording in favor of playback-only on the grounds that the latter would result in bigger sales of prerecorded music. Thus the major companies have been slow to their music available in cassette form.

MGM and ABC were the first companies to jump on the Playtapes bandwagon, as they had with 3M and four-track. Besides these two labels, there were the affiliates—Verve, Kama Sutra, Metro, Command, Westminster, and others.

As music on tape heads into the 1970s, every major record company has expressed interest in exploring the market for reels or cartridges or both. At the end of 1967, Capitol Records acquired Audio Devices, one of the pioneers in raw tape manufacture. Columbia and Victor both expanded their duplicating and manufacturing facilities during 1966 and 1967; and Ampex continued to add new labels to its roster.

What forms will music on tape take in the future? The founder of Bel Canto Stereo Tapes, Russ Molloy, once predicted that you may someday be able to buy a card the size of a file card which would contain a complete pop album or symphony. One tape pioneer envisioned the day when you'd drive up to a gas station with a reel of tape, insert it into a machine together with 50 cents, and the machine would record the latest hit on your tape while your tank was filled. The future, it seems, is limitless.

tape

TAPESONDENTS WANTED

STEVE ALBERT, 1860 W. 6th Street, B'klyn, New York 11223; Owns a Concord F-100 Cassette, 350; Mono (1 7/8 ips). Is interested in Girls, short wave listening, taping records. Would like to tape-spond with anyone.

DON W. BANGS, 2329 E. Bellevue Place, Milwaukee, Wisconsin, 53211; Owner of a Sony 600; Mono and Stereo (1 3/4 ips and 7 1/2 ips). Would like to hear from serious students of Rose Cros Philosophy occult subjects. Answer all tapes.

KEN BOYLE (single, 33 yrs. old) 38 Shelley Grove, Rawcliffe Lane, York, Yorkshire, England. Has a Philips 200 4 track; mono and stereo (1 7/8 ips and 7 1/2 ips). Interests are photography, rhythm and blues, old western. Just about anything anyone wants to talk about.

LEWIS J. CRISPELL, C.P.O. Box 471, Kingston, New York 12401; Owner of a Webcor-Emerson: stereo-mono (1 7/8 ips, 3 3/4 ips, 7 1/2 ips). Likes radio programs, old wax cylinders, vintage disc records.

HOWARD DEANE, 2716 W. 9th Street, Los Angeles, Calif., 90006; Has 6 various recorders, mono and stereo (3 3/4 ips and 7 1/2 ips) Will exchange taped Christian Science material. Have many lectures and Sunday broadcasts, etc.

MIKE DEEM, 2135 17th Street, Parkersburg, W. Virginia, 26101; Owns a Sony 260—Mercury cartridge TR8700 (1 3/4 ips). Interests are radios and tape recordings of all kinds.

DAVID KAHN, 113 W. 42nd Street, Suite 901, New York, New York; Owns Uher 4000L and a Magnecord. Is a disc-jockey for WRTI-FM each Thursday in Philadelphia, called Folk Travels. Interested in all Folk Music.

ERIC MORELL, 12 Sunbeam Road, Syosset, Long Island, New York, 11791; Has a Wollensak stereo 5250, (7 1/2 ips, 3 3/4 ips, 1 7/8 ips, 15/16, 4 track) Prefers 3 3/4 ips. Interested in tape recording, electronics, chess, exchanging music libraries, like rock n' roll, big bands of 40's and other jazz. Will answer all tapes or letters.

THOMAS R. POUTTU, 16427 State Fair, Detroit, Michigan, 48205; Owns a Concord 444 mono and stereo (1 7/8 ips, 3 3/4 ips, 7 1/2 ips). Interests directed toward photography, sports of all kinds. Especially Folk music. Would like to hear from people in California, Oregon and Washington.

B. WILLSON, Box 723, San Leandro, California, 94577; Owns Trav-Ler TT591, 2 track mono, (3 3/4, 7 1/2 ips). Welcomes tapes in Morse code for mutual code practice. Present speed 5 words per minute. Also, any and all miscellaneous opinions, discussions, chatter. All tapes answered.

LOU BANARO JR., 1362 10th Avenue, Schenectady, N.Y. 1203-Owns a Sony 660-Mono and Stereo tapes (3 3/4 ips and 7 1/2 ips). Is interested in pop and jazz and would like to tape with female.

CMSGT L. P. BENJAMIN, The Dunes, Apt 209, 325 Burton Mesa Blvd., Lompoc, Calif., 93436.-Owns Concord 122 Mono- (1 7/8 ips, 3 3/4 ips and 7 1/2 ips). Interested in stamp collecting, speeches of prominent people, general chitchat, chess. Will answer all tapes. has special interest in Germany and other foreign countries in relation to travel.

(Continued on page 50)

Would you like to be included in next issue's listing of Tapespondents? To be sure you are, just fill out the coupon—the more complete the information you give, the better—and mail to TAPESPONDENTS Editor, TAPE RECORDING, 156 East 52nd Street, New York, N. Y. 10022.

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Address

City

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Recorder (s)

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 stereo
 1 7/8
 3 3/4
 7 1/2 Other

Interests:

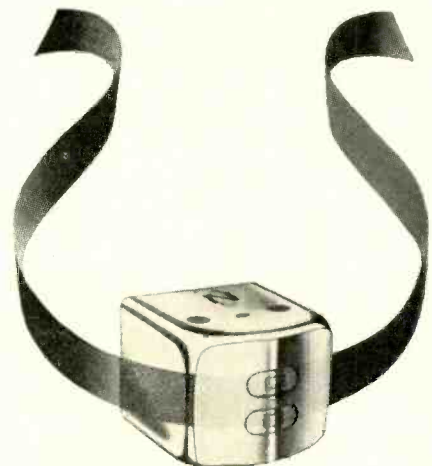
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HIS HEAD
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TAPESONDENTS WANTED

JAMES E. SARGENT, 18 East Columbia Way, Sonora, California 95370. Owns Sony 230, Concord 776 Stereo, mono 1 7/8, 3 3/4, 7 1/2. Interested in Photography, stereo recording.

EDWARD ZAMPEDRI, 912 Capitol Street, Ogden, Utah 84401. Owns Wollensak stereo 1 7/8, 3 3/4, 7 1/2.

TAKAHISA YOKOYAMA, c/o I-A Toyama-Haitsu, Toyama-Cho, Shinjuku-Ku, Tokyo, Japan. Owns Toshiba mono. 3 3/4 and 1 7/8 2 ps. Is a member of the Tapespondence club, W.I.T.S. Interested in travel, electronics, tape-recording and most anything else. Will answer all tapes teenager or adult.

JEFF EMERSON, 820 Kimberly #13, DeKalb, Ill. Owns 2 stereo and mono cassette recorders. 21 yr. college senior. Interested in a wide variety of topics: Andy William, Frank Sinatra, Henry Mancini, Folk and folk rock.

STEPHEN SHARPER, 214 McCully Street, Pittsburgh, Pa. 15216; Has a Magnecord 1024, and a Sony 660, stereo (3 3/4 ips and 7 1/2 ips). Likes classical music, audio film soundtracks.

HARRY SHAW, 3275 B Magnolia, Lynwood, California, 90262; Owns Ampex 4450, Tandberg 64. Interested in classical, opera, some popular. (7 1/2 ips and 3 3/4 ips) stereo only.

LOUIS R. LANGER, 2326 Hanover Street, Palo Alto, Calif., 94306-Owns Sony 660, and Sony 900 A (7 1/2 ips-3 3/4 ips). Interested in Al Jolson all time hits, in exchange for organ or jazz.

KENNETH MILLER, 1500 Grand Concourse, Bronx, N.Y. 10457. Owns Ampex, Revox, Uher-Mono (3 3/4 ips-7 1/2 ips). Wanted: contracts, worldwide, with gift of gab. Sense of humor, desirable. No letters necessary.

EN PASSANT, Sound Magazine for the Blind U.S.A. Rep.: T. T. Perry, P. O. Box 68, Fairfield, Calif., 94533. Has stereo tapes (3 3/4 ips). Interests are hi fi stereo, chess, humor, sound tracks, electronic music. No R/R.

REUBEN POWELL, 1411 Lamar Drive, Springfield, Ohio 45505. Owns Sony 660 and 350 (3 3/4 ips and 7 1/2 ips). Interested in old time country music and any Renfro Valley radio shows over 12-years old.

E. F. REINER, 575 So. Saratoga, St. Paul, Minn. 55116-Mono and Stereo (1 7/8 ips-3 3/4 ips-7 1/2 ips). Electronics, home projects and general conversation.

ROB SPINA, 1920 Point Breeze Ave., Philadelphia, Pa., 19145-Owns Concord Solid state 700-mono, stereo (1 7/8 ips-7 1/2 ips and other 3 3/4 ips) 16 years old; interested in sports, plays all sports, science fiction movies, english sounds, astronomy, tape recording, on school newspaper, interested in all things.

GEORGE THELLY, Thelliyil, Kottayam 2, Kerala, India—Owns a Sony (TC 500A) with four tracks—(3 3/4 ips, 7 1/2 ips)—Interested in popular instrumental and Latin American music and would like someone to send him tapes of the above mentioned from pre-recorded tapes or FM tuners. Will pay cash upon delivery, or through tape exchange.

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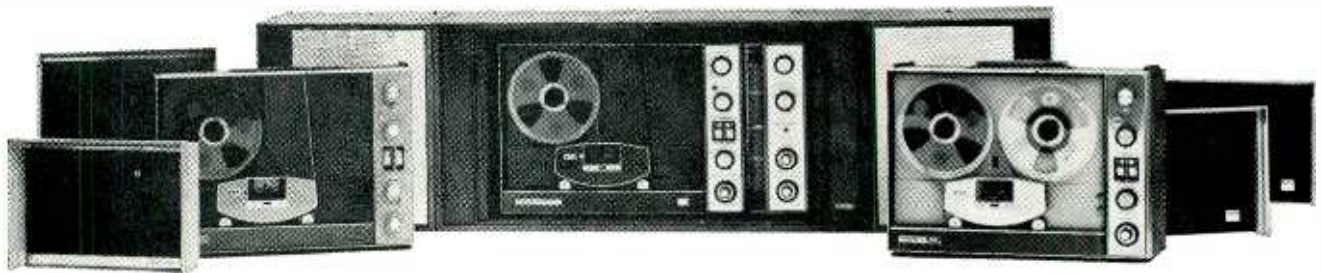
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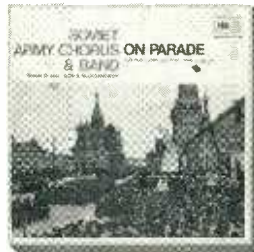
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