

Is 'Big Brother' Taping You?

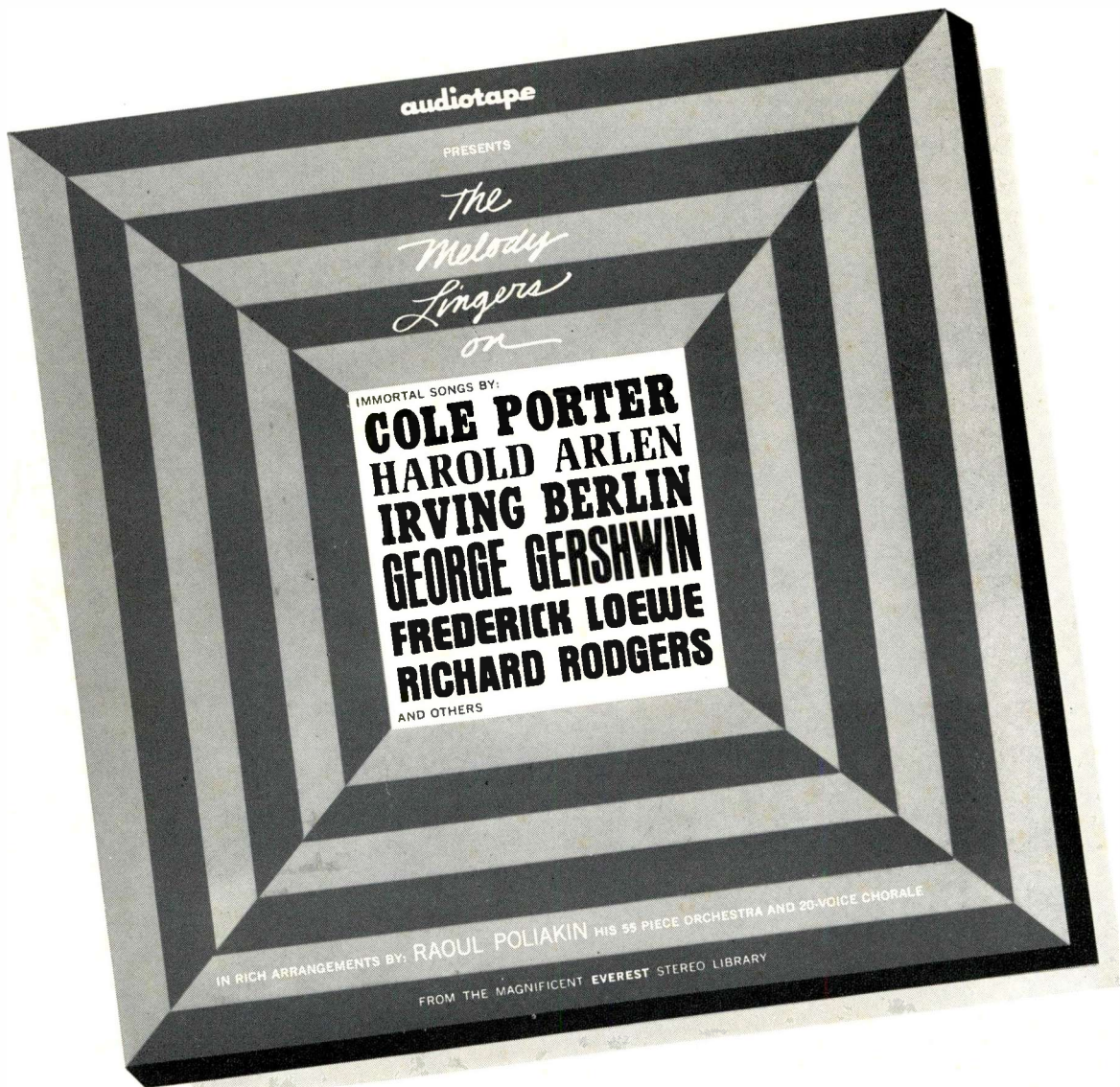
tape

R E C O R D I N G

F E B R U A R Y 50¢



Mr. John Marth
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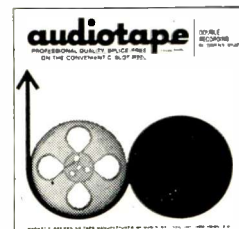


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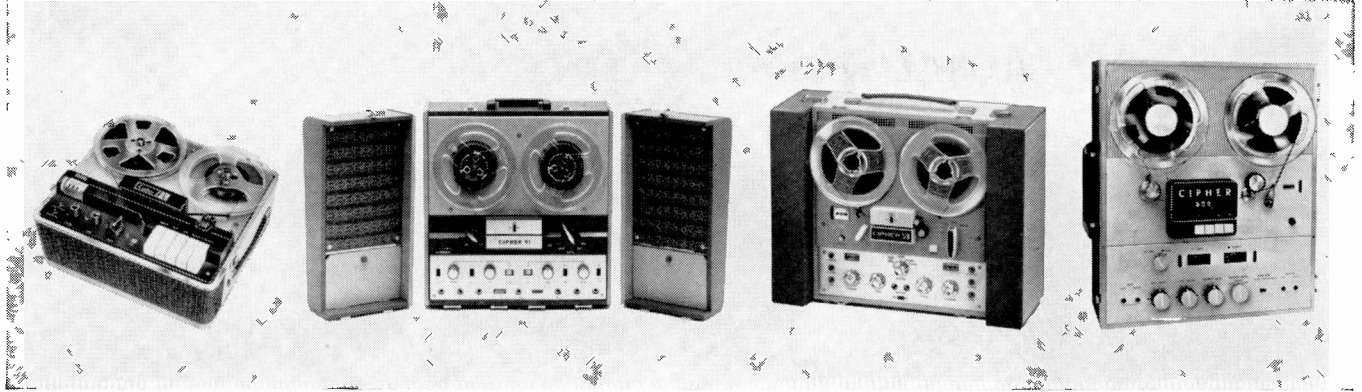
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CIPHER

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Tape Recording

tape

R E C O R D I N G

Articles

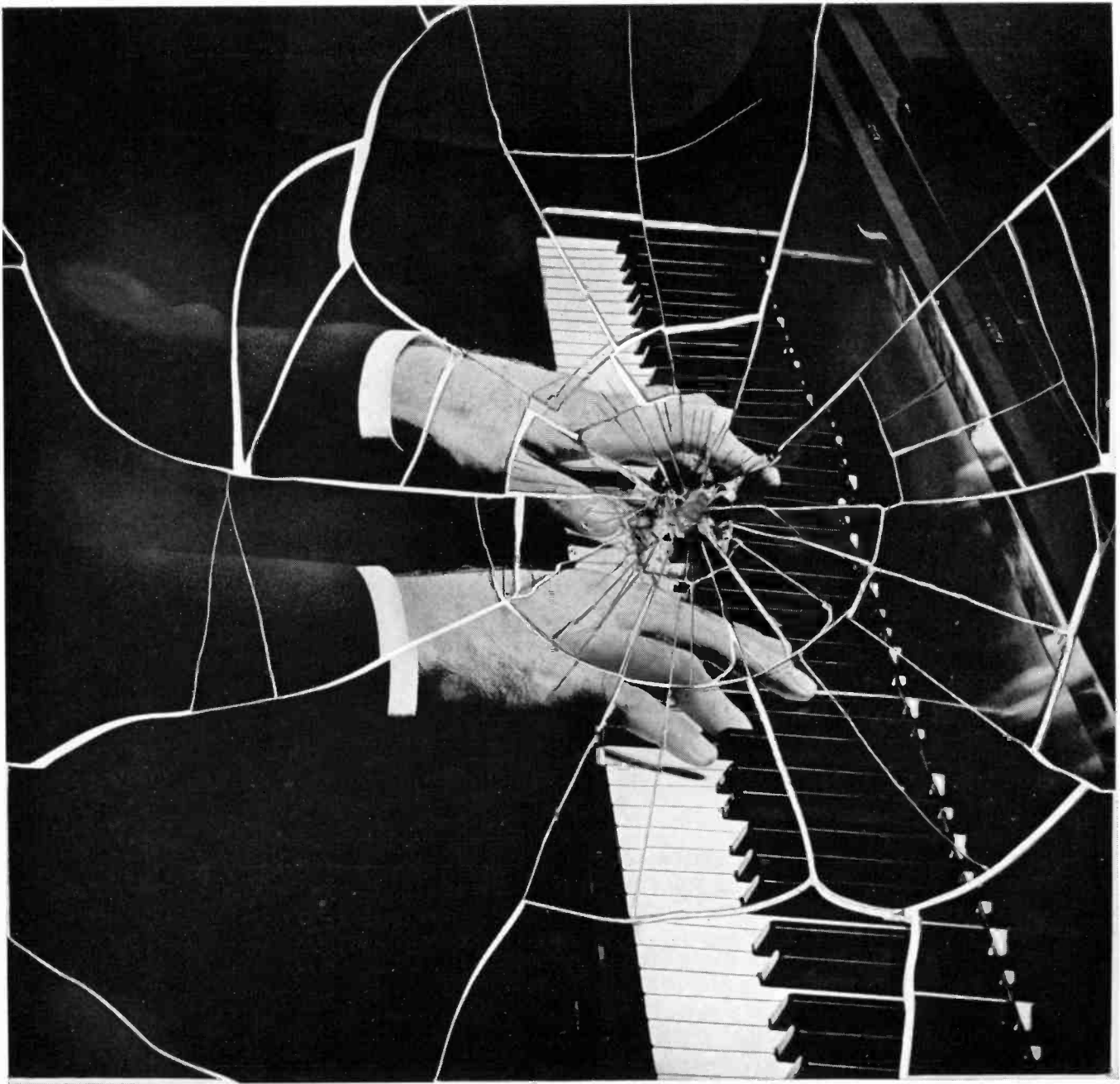
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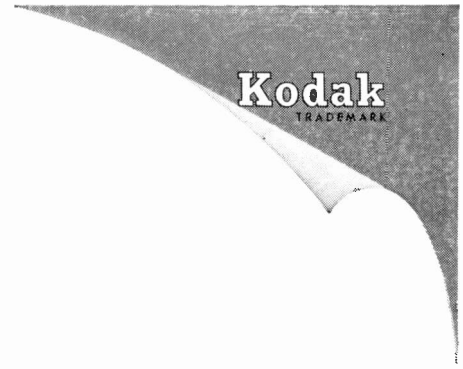
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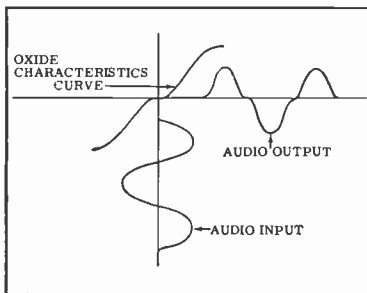
Some plain talk from Kodak about tape:

Bias transfer characteristics and dependent parameters



Ever heard the story about the pilot on his first solo flight? Unfortunately the engine failed. But fortunately he had a parachute. But unfortunately the chute failed to open. But fortunately he landed on a haystack. But unfortunately there was a pitchfork in the haystack. Except for the unhappy ending, this might be the story of how gamma ferric oxides respond to magnetic fields. Everything about it is fortunate with one exception. *Linearity.* The oxide needles used in the coatings have atrocious linearity characteristics. Feed in a clean, pure sine wave and out comes a non-sinusoidal complex waveform that looks something like a demented snake trying to bite its own head off. How does it sound? About as pleasant as Junior's first violin lesson.

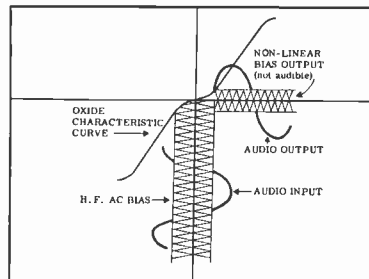
How then is magnetic recording possible? Fret not—there's a way out. The entire problem is solved by one wonderful, mysterious phenomenon called bias. The transfer curves tell the story.



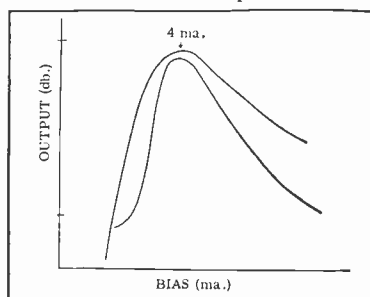
The slightly twisting curve at the upper left represents the oxide response. The lower curve is a pure, sine wave input. At the upper right we have the result of the response curve on the input . . . a mess.

The reason it looks the way it

does is because the sine wave input is affected by the non-linear characteristics of the gamma ferric oxides. But look closely. Note that while the oxide performance is non-linear when taken over its entire length, we can find linearity over selected sections. In other words, we can get rid of our distortion if we can put the signal on the linear section of the oxide's characteristic curve. And that is exactly what bias does. It "lifts" the signal away from the convoluted central area on the graph and moves it out to linear areas.

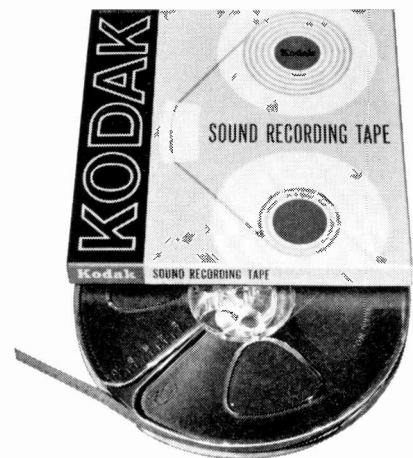


The amount of bias (that is the current in milliamperes) applied to the head is highly critical if top performance is to be achieved. Bias affects output, high and low frequency sensitivity, signal-to-noise ratio and distortion. This curve explains it.



The steep curve represents low frequency sensitivity (measured in db.) at varying bias levels for many tapes. Note that you get good performance

providing you have a bias setting of about 4 milliamperes. (Curves for the other magnetic parameters are similar in shape and all peak at about the same bias level.) Vary one milliampere and you "fall off the curve" and suffer severe losses in sensitivity. Now look at the broader curve. You can vary a milliampere with hardly any change in performance at all. Here's the point. *Kodak tape has that broad curve.* It gives you top performance even though your bias settings aren't perfect. And if your tape recorder is more than a year old, then chances are enough shift has taken place to push you off the cliff. That's why we designed a broad bias curve. And that's why you need it. It's just one more way that Kodak tape gives you an extra bit of assurance of top performance.



KODAK Sound Recording Tapes are available at all normal tape outlets: electronic supply stores, specialty shops, department stores, camera stores . . . everywhere.

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EASTMAN KODAK COMPANY, Rochester, N. Y.

Circle 8 on Reader's Service Card

Is Big Brother Taping You?

by Arthur Whitman



Last September, a car pulled up beside a 36-year-old West German diplomat named Horst Schwirkmann on a quiet street in the outskirts of Bonn. The rear window opened, and a mass of oily liquid flew out, splattering over Schwirkmann's face and body. He screamed in agony. The car roared off. The substance thrown at Schwirkmann was mustard gas, the viscous killer developed for trench warfare in the first World War.

Rushed to a hospital, Schwirkmann survived. However, his lungs are so severely damaged and his torso and legs so badly burned that it seems unlikely he will ever work again. Thus the attack served its purpose—to remove Schwirkmann from the international eavesdropping war.

An electronics wizard, Schwirkmann's special job in the diplomatic service was to clear German embassies of "bugs," or electronic eavesdropping devices. On his last periodic visit to the Russian embassy, he had installed an ingenious device of his own design that administered a severe electric shock to anyone who tried to tap an embassy phone. Nothing will ever be proved, but there is no question that the mustard-gas attack on him was a direct retaliation for installing the shock device.

News of the incident was particularly upsetting to me. As the victim of an eavesdropping outrage myself, Schwirkmann whose job was to prevent such things, was one of the best friends I ever had. Engaged in a project in behalf of one publisher, I was approached by another to do a similar job. For reasons only the good Lord knows, this second man recorded his conversation with me, without my knowledge. When I refused him on the grounds of my prior commitment, he edited the tape, leaving in some ill-considered remarks I had made, but leaving out the substance of our talk—his offer and my refusal. I lost the commission and the substantial sum of money that went with it.

I regret my loss, but I regret even more that I was the only participant in this reechy affair who seemed to find anything unusual, let alone outrageous, in it. With my radar now out on the subject, I've discovered that no one else seems to think twice about electronic prying, either. It has become so much a part of the landscape that when bugs were discovered embedded in the walls of the American Embassy in Warsaw in November, 1964, it hardly caused any stir in the press. On the earlier discovery that our Moscow Embassy had been bugged for at least 11

years, there was some press outcry, but no one in the know was even half horrified. A State Department man, filling friends in on the incident, commented that it was "as surprising as the sun rising in the East."

When you consider how deeply the practice has penetrated our daily life, the official's comment is hardly shocking. Eavesdropping has apparently become as much a part of the American Way as apple pie and mother, though it is hardly as savory as the one or as beneficent as the other. Numbers are difficult to establish in an enterprise that is by definition clandestine, but here are a couple that are available. In 1962, a House Committee reported that at least 5,000 phones in Federal offices in Washington were bugged—not by Russians, but by American bureaucrats spying on each other. Not long ago, an official of the San Francisco Telephone Company estimated that 10,000 firms in Northern California alone monitor the calls of their executive employees without the executives' knowledge.

Here is a partial list of other everyday uses of "bugs" of one type or another:

Federal security agents have microphones installed in certain rooms in popular hotels in many major cities. When guests under surveillance are expected to register, the management is notified and the guests are assigned the bugged rooms.

Agents of the Food and Drug Administration carry concealed tape recorders on routine inspections, to record possible bribe attempts. So do food and building inspectors in some large cities. So do police "shooflys"—the special squads maintained in some cities to police the police themselves.

Local investigators almost everywhere use illegal phone taps to tape evidence against bookies, panderers and the occasional dope pushers who do business by telephone. The evidence cannot be used in most courts, but it does provide useful leads to evidence that may be admissible.

Difficult as it is to sympathize too deeply with suspected spies and known criminals, the fact remains that what can be done to them can be done to the rest of us. Thus, the use of bugs and wiretaps has spread into other areas:

Classrooms in many school systems are bugged so that principals can flick a switch and listen to class

(Continued on next page)

Is Big Brother Taping You?

discussions without the knowledge of teachers and pupils. Going the educators one better, students have, on many occasions, used hidden recorders to "get the goods" on teachers suspected of liberal political views and other heresies.

Business firms regularly bug the offices of key rivals to learn trade secrets or get inside knowledge about sales and other strategies.

Corporations, as we've seen, monitor executives' phone calls. Others have bugs to monitor conversations at spots where employees congregate such as time clocks, locker rooms, cafeterias and washrooms. One large company recently was faced with a strike because it had installed a hidden TV camera in the men's washroom. Another installed bugs in the toilet paper containers in the ladies' john.

Politicians, each election season, tap phones and bug campaign headquarters to learn rivals' plans and strategies.

Individuals involved in civil suits bug each others' premises to gather useful information and evidence. The prime area for this is divorce actions, particularly in states with restrictive codes. So little is sacred in this line of endeavor that bugs routinely are discovered under the beds of estranged husbands and wives who suspect each other of errant ways. The latest twist in this game is the installation of tiny radio transmitters in cars that relay to prying ears and tape recorders any conversations or other sounds produced by drivers and passengers.

Thoughtful connoisseurs of electronic prying attribute its spread to several factors. One is the Cold War fears that have given us a McCarthy and a Goldwater in a single decade and have produced such national phenomena as the John Birchers.

Perhaps the greatest single boost to prying technology is space research, which makes fantastic budgets available for the development of miniaturized sensors and transmitters used to monitor men and modules orbiting and vast distances from the earth. Among the results of this research are powerful transmitters so small they can be embedded in sugar lumps for placement at your favorite restaurant. Women can carry potent transmitters in a cigarette case or lipstick tube. Men use chapstick holders.

There are devices so thin that a transmitter, plus microphone and antenna wire fit between a framed print and its paper backing, leaving a bulge no greater than that caused by normal warpage and wrinkling of the backing. Microphone-and-transmitter combinations fit inside fountain pens. They

also fit into quarter-inch-thick pads of sponge rubber. These may be slid under doors or placed under rugs and carpets in small squares cut out of their normal padding. Ingenious as all this is, it is rapidly becoming obsolete. There are directional mikes now available that are so sensitive that elaborate placement techniques are unnecessary. They can pick up conversational tones from distances up to 500 feet.

Curiously, no one knows whether the uses to which all this prying gimmickry are put is legal or not. The Fourth Amendment assures us of "the right of the people to be secure in their persons, houses, papers and effects against unreasonable searches and seizures," and the Fifth Amendment guarantees that no person will be deprived of liberty without due process of law. These certainly would seem to assure us of the right not to be bugged, but the Supreme Court has been very slow to consider electronic prying as unreasonable search.

This has led to rather moonstruck incidents. In one of the very few arrests Federal officers have ever made on private complaint for eavesdropping (in a recent Washington, D. C., case of industrial spying), the culprits had planted a tiny transmitter in a hotel room. When apprehended, they were charged by the Justice Department not with trespass or violation of privacy, but with broadcasting without a license!

It's doubtful how much good would be done even if our Federal laws did take on better definition in the area. For example, if Congress got interested, the most it could do would be to ban the shipment and sale of bugging devices in interstate commerce. Even if such laws ever did come into existence, circumvention would be laughably easy. Manufacture and sell within the same state and you're home free. If you do ship out of state, be sure you ship only to police organizations and such other exceptions as the law is sure to provide for. Suppression of the devices in these circumstances is about as promising as hunting butterflies with a harpoon.

The states doubtless could provide much more effective control, but so far New York is the only state with a statute making the use of bugging devices a felony. Pressures on our notoriously susceptible state legislatures by manufacturers and distributors of the bugs, as well as by satisfied users, doubtless will prevent the enactment of statutes similar to New York's by many other states—unless there is coherent and persistent action by their citizens. This is an action I would support. In a time and place where anyone with a few hundred dollars and a reason can appoint himself Big Brother, the little brothers have very few options. They can either learn to act together in the interests of preserving their rights—or they can learn to keep their thoughts pure on an individual basis.

Teacher in the house. The Concord 220 is the perfect tutor for music, language, arithmetic or, in fact, **any** subject. It is the world's most advanced hi-fi, 3-speed, pushbutton, dual track, monaural tape recorder. Simple operation: push a button, then record historical events as they are broadcast, rehearse school plays or . . . well, only your imagination can limit the uses of this quality machine.

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CONCORD 220

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*Prices slightly higher in Canada.

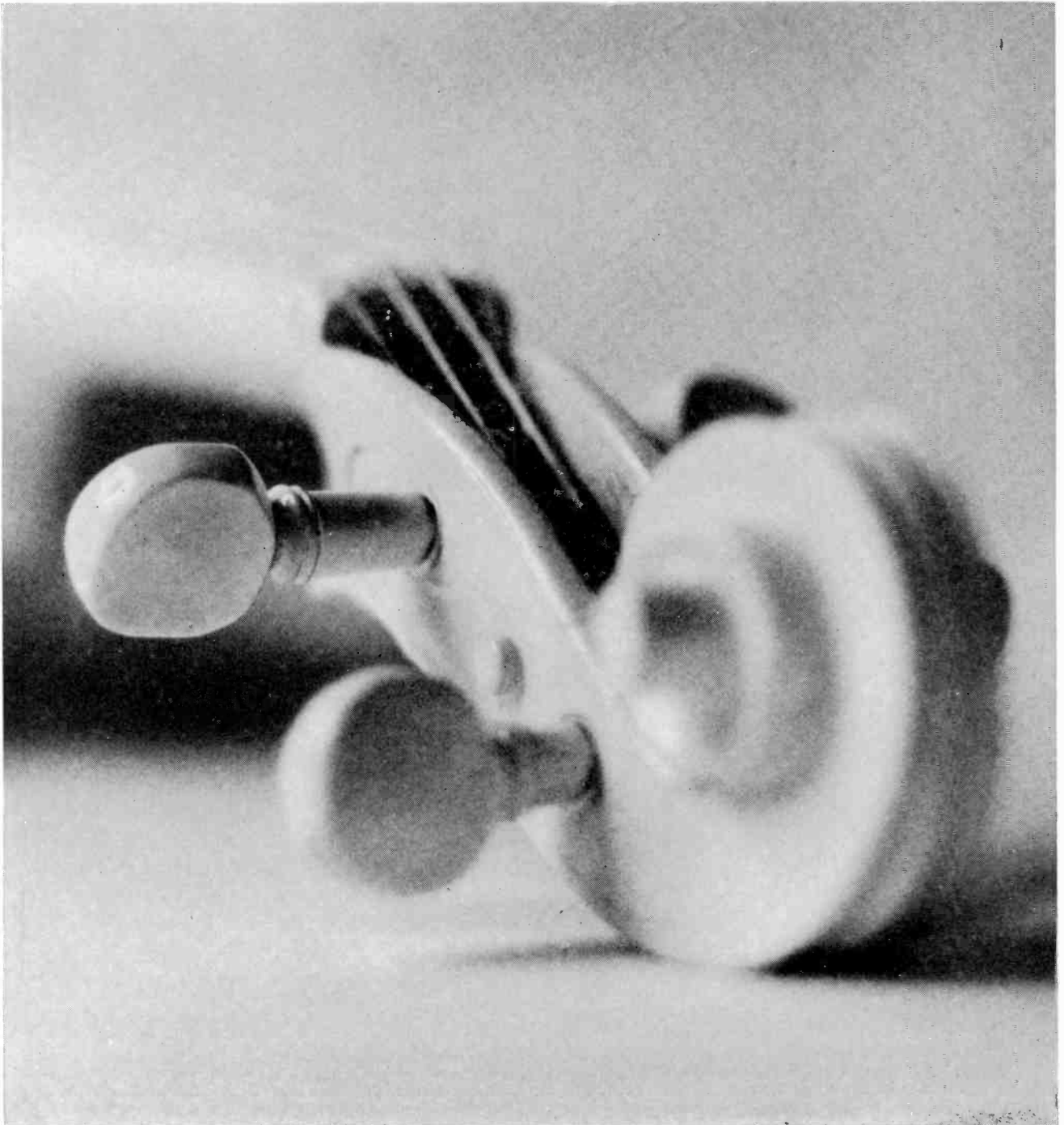
THE SIGNATURE OF QUALITY ■ Tape Recorders/Industrial Sound Equipment/Dictation Systems/Communications Devices/Closed Circuit Television

Circle 7 on Reader's Service Card

Basic Tape Library

Basic Symphonies

James Lyons Selects



Imagine yourself in your favorite armchair in your own living room. You've just placed a stereo tape on your recorder. Suddenly, along the opposite wall, the violin section of a full symphony orchestra springs to life at the left, the violas at the right, and some wind instruments are scattered behind them. The symphony developed from listening conditions not unlike these. The courts of Europe in the midst of the eighteenth century had their own orchestras, and even their own court composers—somewhat as a modern American family might have a maid.

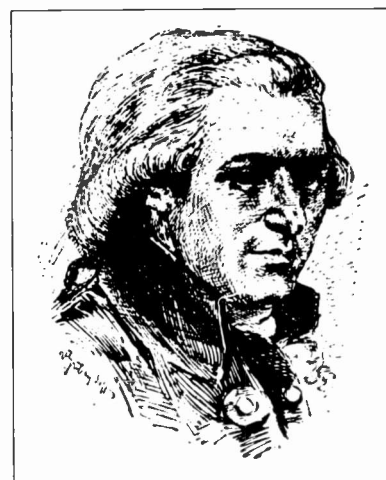
One of these was Franz Josef Haydn, a man born in Austria in the same year as George Washington. His job was to compose instrumental pieces to be played in the drawing rooms of the Austrian nobility, an early patron being Austria's Prince Esterhazy. Symphonies existed before Haydn's time principally as short orchestral passages in operas or in concertos. He was one of the first to expand it, first into a combination of the string quartet and dance suites (collections of popular music of the day, also written by Haydn and his associates), later into the four-movement format we know today—usually starting off with a fairly brisk introduction, followed by a slow movement, then a minuet and trio (holdovers from the dance suites), and finally a summary in rondo form.

Wolfgang Amadeus Mozart, 24 years younger than Haydn, also began composing music in the courts, where he worked with the largest orchestras the aristocracy could afford, or their drawing rooms could accommodate. Both Mozart and Haydn, however, lived in a period of change, when the middle class began emerging in Europe. Soon towns were sponsoring public orchestras, which could afford larger forces than the royalty could. Halls were built which could seat hundreds, rather than the handful which could squeeze into a palace drawing room. The orchestras added new instruments, such as brasses and percussion to the strings and woodwinds. Mozart and Haydn found the sonic combinations possible with these larger forces both exciting and financially rewarding. The last symphonies of Haydn, for example, were composed for a British impresario, who wanted them for public performance in London.

The so-called classical, or formal, period of Haydn and Mozart was followed by the more lyric, more



Haydn



Mozart

Basic Tape Library Basic Symphonies



Beethoven



Schubert



Berlioz

romantic works of Mendelssohn, Schubert and Beethoven. They expanded the symphony from the 20-minute pieces of their predecessors into works running more than an hour. They added more musicians—and an important figure, the conductor, appeared on the scene for the first time. In Haydn's day, the orchestra might take its cue from the concertmaster (the man in today's orchestra seated immediately to the left of the conductor in the violin section). The larger forces required by Mendelssohn or Beethoven required a conductor to keep all sections of the orchestra together and playing in the same time.

Whereas the classicists worked with form, the romantics—led by Beethoven—worked with orchestral color, painting pictures in sound. A good example is Beethoven's "Pastoral" or sixth symphony, which abandons the four-movement formula altogether to sketch a tonal portrait of a summer day in the German countryside. It was Beethoven who, in the opinion of many musicologists, brought the classical style of symphonic writing to its most perfect and highly organized state. Soon 45 minutes was considered average playing time for a symphony. As the Romantic Period wore on, however, some composers began equating length and size with aesthetic achievement. This movement probably started with Hector Berlioz, who was also interested in the tonal possibilities of the orchestra. It received impetus from Richard Wagner, the opera composer who produced no symphonies, and is best exemplified in the symphonic monsters of Mahler and Bruckner.

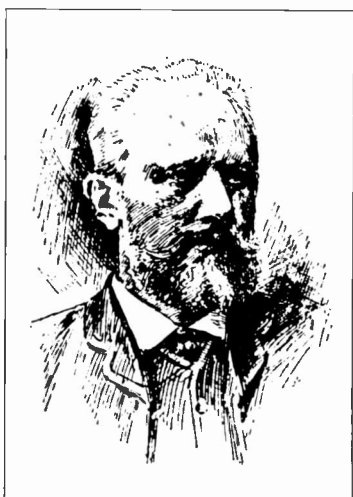
Not all late romantic music was gargantuan. The Czech composer Antonin Dvorak, perhaps best known for his last symphony, "From the New World," used a normal-sized orchestra and rarely exceeded 45 minutes in playing time. Dvorak was known in musical history as a Czech nationalist composer because of his extensive use of folk themes from his homeland. The "New World" symphony, however, relies on American folk songs with which the composer is said to have fallen in love during a stay in Iowa. Almost contemporary with Dvorak—and with industrialist Andrew Carnegie—was Johannes Brahms, a devout admirer of Beethoven. So great was his admiration, in fact, that despite the fact that he was an established composer of songs and piano pieces, it took his friends more than ten years to persuade him to tackle his first symphony. His reason was that his efforts would seem small in comparison to Beethoven's nine great symphonies. If record and tape sales are any indication, Brahms was wrong; his symphonies are sought by collectors just as eagerly as are Beethoven's.



Brahms



Schumann



Tchaikovsky

Of the other late Romantics—Saint-Saens, Franck, Tchaikovsky—it is probably the symphonies of the latter which are most familiar to Americans, who have heard them in their natural state or excerpted as popular songs. The mad Russian (he suffered greatly from nervous disorders which more than once came near to insanity and certainly colored his music) made up for this lack of organization with a superb sense of melody and a genius rivalling that of Berlioz for orchestration. Of his six symphonies, it is only the last three which we hear widely in America.

The coming of the twentieth century brought another shift in musical format. Composers such as Stravinsky, Hindemith and Schoenberg rebelled against what they considered the sugary sweetness of the romantic symphony. With such large orchestral forces at their disposal the moderns experimented with the contrast of rhythm upon rhythm and harmony upon harmony as the romantics had experimented with tonal colors. Some have even gone back to the strict classical forms of Mozart and Haydn, working with small orchestras, while others such as Shostakovich, Vaughn Williams and Aaron Copland have experimented with a fusion of the romantic and the modern symphony.

The next time you listen to a tape of a Beethoven or Brahms symphony in the comfort of your own living room, remember that even the aristocracy of eighteenth century Europe could not have afforded to have a full symphony orchestra in their homes. And when you play Mozart or Haydn—well, you're living as well as the Esterhazys.

Here then is a list of basic symphonies for your tape library.

James Lyons' byline has been familiar to collectors of serious music recordings for more than a decade through his perceptive and detailed notes for recordings by every major company in the field. The editor and publisher of the nation's oldest periodical covering recorded music exclusively, The American Record Guide and The American Tape Guide, Mr. Lyons is the author of two books on music appreciation, countless articles on the subject for the nation's leading magazines, newspapers and encyclopedias; and has conducted a radio feature on music of the ballet for FM good music stations across the country. He has also served as an editor of Musical America and music critic for several major daily newspapers. Mr. Lyons has made his home around the corner from Carnegie Hall in New York—and the pathway between them is well-trod.

James Lyons

Selects

Basic Symphonies

Actually, this list includes more than 10 basic symphonies because of the ability of tape producers to put two shorter symphonies on a single reel of tape. I commend all 10 tapes listed here—and all of the symphonies on them—to anyone wishing to become familiar with the symphonic literature. —J. L.

1. *Beethoven—Symphony No. 5 in C. Cleveland Orch. cond. Szell with Mozart—Symphony No. 41, "Jupiter" Epic EC 839, \$7.95
2. Brahms—Symphony No. 1 in C. Boston Symphony Orch. cond. Leinsdorf RCA Victor FTC 2181, \$7.95
3. Brahms—Symphony No. 2 in D. New York Philharmonic cond. Bernstein Columbia MQ 500, \$7.95
4. Bizet—Symphony in C. New York City Ballet Orch. cond. Irving with Gounod—Symphony No. 1 in D Kapp KTL 49001, \$7.95
5. Dvorak—Symphony No. 9, "From the New World." NBC Symphony Orch. cond. Toscanini RCA Victor FTC 2082, \$8.95
6. Haydn—Symphony No. 104, "London." Vienna Philharmonic Orch. cond. von Karajan. With Mozart—Symphony No. 40 RCA Victor FTC 2080, \$8.95
7. Schubert—Symphony No. 8, "Unfinished"; Symphony No. 3. Pittsburgh Symphony Orch. cond. Steinberg Command C 11017, \$7.95
8. Schumann — Symphony No. 3, "Rhenish." New York Philharmonic cond. Bernstein Columbia MQ 475, \$7.95
9. Sibelius—Symphony No. 2 in D. Philadelphia Orch. cond. Ormandy Columbia MQ 520, \$7.95
10. Tchaikovsky—Symphony No. 4 in f. New York Philharmonic cond. Bernstein Columbia MQ 455, \$7.95

Some Other Symphonies which belong in your library:

- Brahms—Symphony No. 3
Pittsburgh Symphony Orch. cond. Steinberg (with Brahms—Tragic Overture)
- Haydn—Symphonies Nos. 100 and 101
Vienna State Opera Orch. cond. Woldike
Vanguard VTB 1609, \$7.95
- Mozart—Symphonies Nos. 33 and 39
Vienna Philharmonic Orch. cond. Kertesz
London LCL 80135, \$7.95
- Mozart—Symphony No. 41, "Jupiter"
(Continued on page 18)

A 10-MINUTE COURSE ON MICROPHONES TO EXPLAIN A PHENOMENAL SUCCESS STORY



**Why the new 8000
is the most demanded
microphone (of its kind!)**

New University 8000: \$29.95.
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Model DS-10 Desk Stand: \$6.95.

It's a cardioid. It's dynamic. It's shock-mounted. It offers variable impedance and uniform wide-range response. It's designed and made by LTV/University and it's less than \$50.00. Less than any other cardioid! It's only \$29.95. And it's sold with the world's only five-year microphone warranty!

The new University 8000 is a "first" and "only." For those who like to be exclusive, that's one reason for buying it. The important reasons may be found in the following microphone buyers' guide!

There Are Cardioids...and Cardioids. All cardioids are essentially "deaf" to sounds originating from the rear. They're invaluable for eliminating background sounds, for use in noisy and reverberant areas, for reducing feedback and for permitting a higher level of sound reinforcement before feedback would normally occur. BUT—not every cardioid uses rugged dynamic generating elements. There are crystal cardioids which offer high sensitivity and output. But their response is limited; deterioration is rapid due to heat, humidity, rough handling. The University 8000—a cardioid dynamic—is virtually indestructible.

Tape Recording. Cardioid mikes are essential for quality recordings. They pick up only the performer over a wide frontal area. They prevent the output of speakers from affecting the mike, thus eliminating feedback squeal, and permit recordists to work from far or near. For stereo, only cardioids can assure proper balance, if both are matched. University quality control makes any two 8000's absolutely identical "twins" to assure full stereo effect.

Realism. The new 8000 offers wide-band response, extremely uniform to eliminate sibilants (hissing S's), bass boom and tinny treble. Its reproduction quality is virtually indistinguishable from the live performance. The 8000 has variable impedance—30/50 to 20,000 ohms, and comes with a 15-foot cable.

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Circle 14 on Reader's Service Card

Basic Tape Library Basic Symphonies

(Continued from page 17)

Vienna Philharmonic Orch. cond.
Von Karajan (with *Haydn—Symphony No. 103*)

London LCL 80138, \$7.95

Prokofiev—*Symphony No. 1, "Classical"*
Orchestre du Suisse Romande cond.
Ansermet (with music of Borodin,
Glinka)

London LCL 80087, \$7.95

Schubert—*Symphony No. 9, "The Great"*

Columbia Symphony Orch. cond.
Walter, Columbia MQ 467, \$7.95

Off the Beaten Track

Bizet—*Symphony in C*

New York City Ballet Orch. cond.
Irving (with *Gounod Symphony No. 2*)
Kapp KTL 49001, \$7.95

Borodin—*Symphony No. 2*

Orchestre du Suisse Romande cond.
Ansermet (with *Borodin—Symphony No. 3*), London LCL 80102, \$7.95

Ives—*Symphony No. 3*

Eastman-Rochester Symphony Orch.
cond. Hanson (with *Ives—3 Places in New England*), Mercury C 90149, \$7.95

Mahler—*Symphony No. 8, "Symphony of a Thousand."*

Utah Symphony Orch. cond. Abrahams, Vanguard VTP 1687, \$7.95

Prokofiev—*Symphony No. 5*

Cleveland Orch. cond. Szell
Epic EC 819, \$7.95

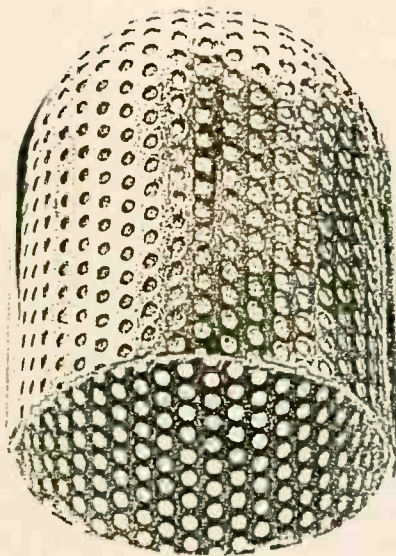
Saint-Saens—*Symphony No. 3, "Organ"*

Orchestre de la Societe des Concerts
du Conservatoire cond. Pretre
Angel ZS 35924, \$7.98

Shostakovich—*Symphony No. 5*

New York Philharmonic cond. Bernstein, Columbia MQ 375, \$7.95

*The nine Beethoven symphonies are available complete in a special five-reel pack from Everest with Josef Krips conducting the London Symphony Orchestra for \$19.85. Although you may not want all nine symphonies in your basic library, you'll want more than one—and price plus performance make this an exceptional value.

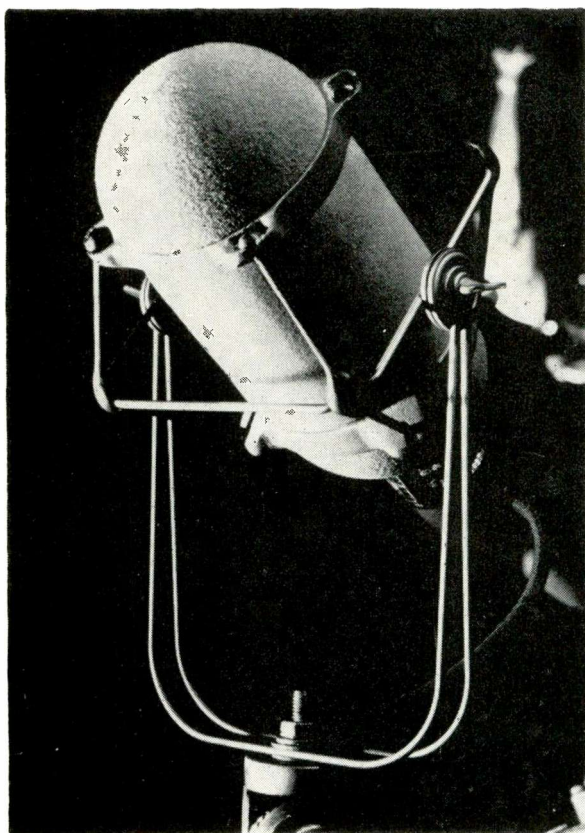


Inside Microphones

by George Robertson



When you buy a tape recorder or tape deck these days, the chances are better than two to one the manufacturer will throw in a pair of microphones to sweeten the deal. The more expensive the recorder, the better these microphones are likely to be. However, if you do very much live recording, a time usually comes when you discover that the microphones you got with your recorder can't do every recording job equally well. That's why the larger microphone manufacturers offer dozens of different microphones—designed for every conceivable use.



The microphone most commonly supplied with tape recorders these days is a low-cost omnidirectional crystal or ceramic. Despite its price (usually not more than five dollars), it can handle an amazing number of recording chores satisfactorily, and do some of them very well indeed. What do the big words mean? These two and others, such as cardioid, bi-directional, ribbon, ceramic and crystal, when combined, describe many of the mike types in use today.

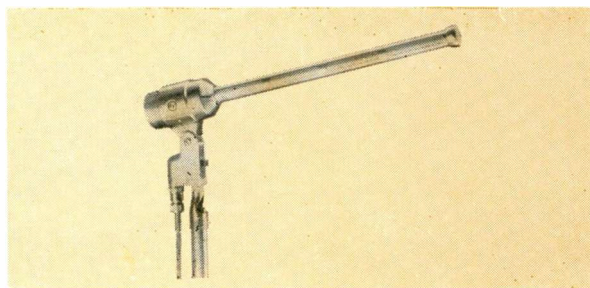
The purpose of the microphone is to convert sound waves into electrical energy which is fed into the electronics of the tape recorder, amplified and eventually appears as magnetic impulses on tape. There are many ways of doing this job. Microphones incorporate generating elements which are widely varied, each of which has a particular application.

In addition to many types of generating elements, there are various acoustic configurations made possible by ingenious design. Crystal and ceramic microphones are the least expensive and perform a fine utilitarian job. They are not generally desirable for high-quality recording because of their inherent weaknesses such as comparative inconsistencies one from another and great difficulty in providing extremely wide response with very small deviations in the curve. In other words, it is difficult to obtain flat response with this type of microphone.

Ribbon microphones which utilize a thin strip of material which is set in motion by the sound waves hitting it, are considerably better than crystal or ceramic microphones but because of their extremely fragile nature, they are finding decreasing favor. The ribbon microphone, while still used in some degree, is being rapidly replaced by the dynamic microphone.

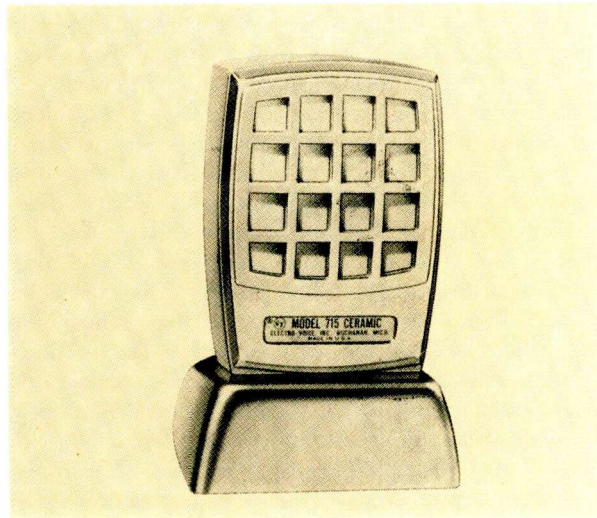
The dynamic microphone has virtually all of the advantages desired in this type of device. Sound waves strike the diaphragm of the microphone to which is secured the voice coil. This moves in a magnetic circuit, generating voltage which is fed to the electronic circuits and amplified. It is an extremely rugged configuration when properly designed and is virtually impervious to damage. It is possible to build dynamic microphones of extremely wide range. Unlike most other types, they are impervious to changes in temperature or humidity.

Microphones can generally be classed by the type of generating element, and in addition, by the pickup pattern. In common use, there are four pickup patterns. The omnidirectional pattern which picks up sound equally in all directions, a bi-directional or figure eight pattern which picks up sound equally from the front and back of the microphone but not from its sides, a cardioid microphone which picks up sound in a heart-shaped pattern around the face of the microphone and rejects from the sides and the rear, and a new configuration, the cardiline, which is an elongated cardioid dividing pickup over a greater distance from the microphone. Each of these types has specific applications, but a rule of thumb is that for the most professional results under the most difficult conditions, a cardioid pattern is preferred. Combining a dynamic generating element with a cardioid pickup pattern will ensure close to



professional results even in the hands of relatively inexperienced users.

When you purchase a microphone, the dealer will want to know the "impedance" you will require for use with your recorder. Most recorders in the non-professional class employ a high impedance input. All crystal and ceramic microphones are high impedance types. However, all other generating types,



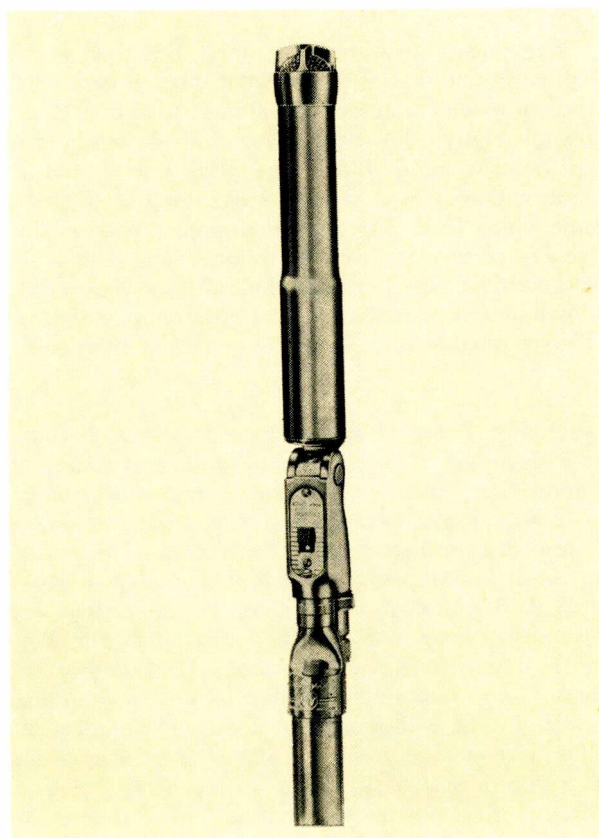
dynamics, ribbons, condensers, etc. are available either in high impedance or low impedance. In most cases, by a simple change, the better quality microphones may be modified to either high or low impedance. For professional applications, almost without exception, low impedances are used. A principal reason for using a low impedance microphone is that it enables the recordist to run a microphone cable an almost infinite length. High impedance lines should not be run much more than 15 to 25 feet. When it is not practical to place the microphone near a tape recorder, a low impedance must be employed. In choosing a microphone to improve tape recorder performance, some additional factors should be considered. For example, hum pickup can be annoying if the microphone is placed too close to high intensity fields such as arc lights and fluorescent lights. On the other hand, most good dynamic microphones have some shielding or use coils to minimize this. It is axiomatic that the more expensive the microphone the less susceptible it is to extraneous electrical noise because of care in its manufacture.

Most tape recorders, even those sold quite inexpensively, are capable of surprisingly fine dynamic range of reproduction. A better microphone is the most significant improvement that it is possible to make, and the results can be quite startling. Keeping simple rules in mind can make an "expert" out of even an amateur recording fan. Treat your microphone with reasonable respect, but do not be afraid

of handling it. It is not a fragile laboratory instrument that cannot be handled without special care. When you decide you're ready for a better microphone than the one you got with your tape recorder, choose the most expensive microphone your budget will permit and consider a dynamic microphone with a directional or cardioid pickup pattern. Purchase a microphone that can be wired for either high or low impedance.

When you go out to buy that superior microphone (or a pair of them) to use with your recorder, keep in mind your ultimate objective. Consult the chart on page 44, it will be useful to you. Remember also that good microphones may be transferred from one tape recorder to another. Your quality microphone will probably be with you long after you change your tape recorder as your interests and techniques expand.

A good microphone can be compared to a camera lens. There is simply no way of improving a camera if the lens is not good. Improving the lens will improve the quality of the picture quicker than any other camera improvement. So, too, improving your microphone will improve your recordings quicker than anything else.



In succeeding issues, this publication will be offering comprehensive articles on understanding microphones and modern microphone techniques. For a basic guide turn to page 44.

Pictures on Tape

by Robert Angus

The home videotape recorder is here—and it costs \$3000.

In the early 1920s, it was the crystal set. In 1939 and 1940 it was FM radio. In the early 1950s it was tape recording and component high fidelity. Today the electronic gadgeteer who has everything is setting his sights on the home videotape recorder. With it and a closed circuit television camera, he can tape instant home movies—playing them back immediately after they're made. With a television set and a timer he can tape the Late Late Show (starring Clark Gable and Jean Harlow) for replay at a more conventional viewing hour. Or build a library of funny bits from the Danny Kaye or Ed Sullivan TV shows. Or use the gadget to improve his golf swing or entertain his friends at a party. And all it costs today is a mere \$3000.

The price may seem a bit steep. But then so did ball point pens at \$39 in 1947. Or a seven inch black and white television set at \$900 in 1939. These things are all relative. For the fellow who's determined to be the first in his block, the price tag on today's home videocorders may not seem steep at all for a unit which looks like a conventional tape deck but records pictures as well as sound. Especially when you consider that one manufacturer will throw in a closed circuit television camera, microphone and 21" TV set mounted in a console as part of the deal.

Actually, home videotape recorders have been on sale since the Neiman-Marcus department store in Dallas, Tex., put the first one on sale more than a year ago at \$30,000. Of course, you get more than a recorder for that price. The Signature V, manufactured by Ampex Corporation, included a videotape deck similar to those in use by universities and businesses across the country (which sells for \$11,500). Then there was an Ampex F-44 stereo tape deck if you wanted to change to stereo sound occasionally. In addition, there was a high quality 21" color TV set and component stereo receiver mounted in a tastefully styled console. To top it off, Neiman-Marcus threw in a closed circuit TV camera and two dynamic microphones (so you could make instant home movies as well as home stereo tapes).

Despite this bargain in home entertainment, the public seemed unaccountably slow to respond. In a belief that the Signature V's price might have had

something to do with it, several companies announced plans to develop and sell their own home videotape decks at prices ranging from \$150 to \$500. The first of these was Telcan, Ltd., a British firm which has since gone bankrupt trying to perfect a tape deck which would use standard audio tape to produce both picture and sound. Telcan demonstrated its picture and sound for educators and the press shortly after the Ampex unit went on sale. One critic described its picture as "murky;" another complained about the limited range of the sound channel. Since the Telcan deck operated at the phenomenally high tape speed of 120 inches per second—16 times as fast as most sound recorders—it consumed a tremendous amount of tape. In fact, it took an 11" reel of triple-play tape to hold 22 minutes' worth of uninterrupted picture and sound. The tremendous tape speed created other problems—heads wear out much faster at these speeds, as do the tapes themselves. In fact, tape used on the Telcan unit was worthless after about 400 hours of combined playback and recording even for low-quality audio recording because of the beating taken by the tape backing and the oxide coating. Heads had to be replaced every 100 hours, at an alleged cost of two dollars.

The Telcan recorder, which looked very much like an ordinary tape deck, offered customers pictures of mediocre quality (when compared to the TV original) at a cost of about 70 cents per minute of recording time. Next on line was Fairchild Camera, whose recorder is due to go on sale shortly after this article appears. Fairchild's recorder produces a near-perfect picture at 120 ips on a special quarter-inch instrumentation tape. Or you can have a picture lacking somewhat in contrast at 60 ips. Sound quality is comparable to that from a good FM table radio, but it is monaural. Originally, Fairchild hoped to license some television set manufacturer to produce and sell the deck for home use at a target price of less than \$500. But negotiations have dragged, and the company has decided to manufacture and sell two models of the recorder itself at a price of \$3000.

The man who quoted the \$3000 figure was Wayne Johnson, vice president of the Fairchild subsidiary which developed the recorder. "There will be two models, and actually we don't intend either one for home use. One, the Executive, is a console model

which contains the video tape deck and a 21" TV monitor mounted in an attractively styled console. The other is a professional monitor, designed for use by institutions. It will include the deck plus the necessary record and playback amplifiers mounted in a portable (65 lbs.) case." Fairchild still hopes to see the low-cost version, but doesn't expect to for some months.

"Ultimately, I expect to see a popular model and a high fidelity model," Johnson says. "The popular model probably will offer the user the choice of 60 and 120 ips and will use less expensive transistors, motor and other components. The high fidelity version will contain the best transistors we can get, a hysteresis synchronous motor, and probably will be 120 ips only." Fairchild's \$3000 price, however, includes a closed-circuit television camera which can be wired directly to the recorder to produce instant indoor home movies.

Another recorder scheduled to appear early this year is the Loewe Opta Optacord 600, which uses a one inch wide instrumentation tape at a speed of six inches per second. The slow speed is made possible because the German-developed recorder uses a rotary head similar to those used in the professional Ampex and RCA models. Its price is \$2500 complete with camera in deck form. The machines are being made in Germany for sale here through a syndicate headed by Sylvester (Pat) Weaver, peppery former head of the National Broadcasting Company's television network. Weaver, who has spearheaded a drive for pay-TV on the West Coast, has been accused of hedging his bets by pushing equally hard for home videotape. Weaver did nothing to dispel this impression when he predicted that the Loewe Opta machine was the forerunner of a "Tape of the Month" club which could offer a Broadway show one month, a travelogue the next, a complete opera the third, and so on. He predicted that the public would be able to amass its own home videotape library of great entertainment.

At the moment, however, Weaver's organization expects to be able to sell all the videocorders it can get to hospitals, education and industry at the \$2500 price. But if you really want one . . .

From Philips in the Netherlands comes a machine similar in price and specifications to Loewe-Opta's. Norelco, Philips' American subsidiary, had yet to demonstrate the recorder as this article was prepared, but trade reports from Europe indicate that picture quality is excellent.

Hi-fi buffs have been promised a recorder which will provide stereo high fidelity sound as well as pictures at 30 ips using standard audio tape by Par Ltd., a research and development firm in Baltimore, Md. At press time, the Par videocorder remained

little more than a promise, although one of its developers, engineer Stewart Hegeman, says his organization hopes to lease the manufacturing rights to a major electronics firm sometime this year. Hegeman feels that the Par recorder could be made to sell for only slightly more than a sound recorder of equivalent quality.

Going Hegeman one better is the Sony Corporation of Japan, which hopes to have a recorder on sale in time for next Christmas at a price below \$1000. Sony's top brass aren't talking much about the machine, except to acknowledge that it's in the works and that sound and picture quality will be determined in large part by how much the American public is willing to pay. "We can give full frequency sound reproduction as well as stereo sound if the public demands it," a representative said recently, "but we can make a cheaper machine which will match the sound capability of most of today's TV sets." The man from Sony acknowledged that his company's machine operates at 7½ ips on a tape ½" wide, and that the Sony plant in Japan is equipped to manufacture and sell the tape. "We expect it to cost about \$20 for an hour in the United States."

Home videocorders are coming, evidently. But they bear about as much resemblance to the videocorder you may be using five years from now as the Ampex 350 and Magnecord PT-6 recorders of the early 1950s bear to today's high quality home recorders. "It's like color television or any other new development," an engineer associated with one of the companies told TAPE RECORDING. "The first models to hit the market are expensive, and there are a lot of bugs to be ironed out. It will take us some time, for example, to find out the best and most economical tape to use with our recorder. And by the time videocorders reach the popularity of today's sound recorders, we're going to have to do something about the need for head replacement."

But the biggest obstacle insiders see to public acceptance of this first crop of home videotape recorders is the high cost of tape. It costs approximately \$12.50 to record one hour of television programming with the Fairchild recorder—according to a company estimate based on the possible cost of instrumentation tape in large quantities. Loewe-Opta estimates a similar cost for its videocorder, while other estimates run much higher. This high cost would prohibit most of us from building a sizeable library of home videotapes. And even the most optimistic insiders aren't predicting sound quality to match most of today's good stereo machines for the foreseeable future. So if you're thinking of waiting for an all-inclusive recorder, you may be in for a long wait.

(See Chart—page 56)

Are separate
tuners and
amplifiers passé  



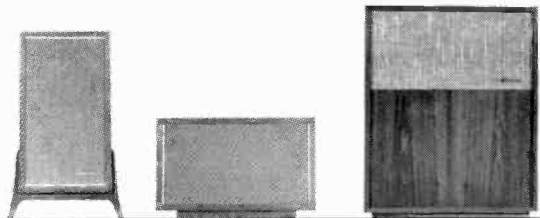
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Taping FM Stereo

by Hans Fantel

It's a steal, plain and simple. With your tape recorder hooked to an FM tuner, you just grab a hunk of music out of the sky, and it's yours for keeps. In stereo, too! What with FM stereo stations dotting the U. S. map ever more densely, residents of nearly every major city have a virtually limitless reservoir of two-channel music floating over their roofs.

Musically, the choice is even wider than on records. For many FM stations carry live stereocasts of concerts, often combining singers, soloists and conductors that could never appear together on discs because of conflicting recording contracts. The entire Boston, Philadelphia and New York Phil-

harmonic series are aired regularly in stereo. Particularly interesting are the many special broadcasts from leading music festivals, some of which are available in stereo. Because of commercial considerations, many of these performances will never find their way onto discs. But they can become part of your personal tape collection.

Besides, taking music off the air is markedly cheaper than buying records. Even at discount prices, a classical stereo disc on a major label is apt to cost you upwards of four dollars; but an hour's worth of stereo (recorded on a four-track machine at 3¾ ips) comes to only \$1.50 even when you use the best

Taping FM Stereo

tape. Another important factor is the flexibility of your investment. If you find that you tire of a piece after several hearings, you can erase it and use the same tape for another broadcast.

The trick is to tap that musical reservoir in the sky and turn it into a program source for your tape recorder. A component-type FM stereo tuner (or complete stereo receiver) is by far your best bet for this purpose, although a good FM stereo table radio or console will do. Whatever type of receiver you use, its performance will be enhanced by the selection and use of a good FM antenna. The right antenna gives your tuner or radio a far better chance of catching FM stations clearly and reliably. The farther you are from the station, the better your antenna should be. Especially for stereo broadcasts, a multi-element roof antenna (if necessary with rotor) is virtually a necessity.

If you have a component-type sound system, hooking up your tape recorder is extremely simple. At the rear of your amplifier (or preamplifier, if you are using a separate control unit) you will find two small round sockets marked TAPE OUT—L-R, the final two letters signifying Left and Right channels. You run a pair of patch cords (special connecting cables with pin plug terminals—you can buy them for a few cents at any audio shop) from these TAPE OUT sockets to the left and right input terminals of your tape recorder. (By the way, don't use the microphone inputs but a separate set of inputs marked PHONO or LINE). That's all. From then on, anything that comes in on your FM tuner is piped automatically to your tape machine. You're set for recording. If it's a stereo broadcast, use both channels. If it's a mono broadcast, just use one.

How about playback? On many stereo tape recorders you'll find a set of terminals designated as outputs for an external amplifier (usually marked EXT AMP). Your tape recorder instruction manual will give you particulars for your model. From these terminals you run two patchcords (one for the left, the other for the right channel) to a set of inputs on your amplifier marked TAPE IN. When you play your tapes the music will then be reproduced automatically through your amplifier and speakers.

Even if you haven't got a component rig, you can still latch your tape machine to the skyborne bonanza. Suppose you have an ordinary FM stereo console or a good table-model FM stereo radio. Now, the obvious thing—and some people actually have done it—is simply to set your mikes in front of each speaker, turn on the recorder and whirl away. Don't

you do it! For one thing, the acoustics of your living room will blur the recording when they are picked up by the mikes—along with street noise, the telephone, the dog, the racket from the dishwasher, your wife, and your children. Family mementos on tape are fine. But not as background for Beethoven. Besides, the mikes are the weakest part in the typical home recorder and they're apt to limit the fidelity of whatever you're getting off the air.

The only really effective way to hook a tape recorder to a radio receiver is by direct electrical connection. No mikes. If your FM stereo set doesn't have a special TAPE OUT terminal for connecting a tape recorder, you can improvise one. Go to your audio dealer and ask him to make up two input cables for your tape machine, each with a pair of alligator clips at one end. Next you take the back off your radio and fasten the clips at some convenient spot (usually the speaker terminals) to the wires running to each speaker. If output transformers are mounted on the speakers, attach your leads between the transformer and the speaker, not between the radio chassis and the transformer. The other ends of your patch cords, equipped with regular pin plugs, again go to your tape recorder inputs.

This method isn't quite as good as getting your signal from a special tape-recorder connection on component-type equipment. But at least it lets you bypass the weakest link in the signal chain—your radio speakers and your recorder mikes—in getting the broadcast on tape.

The alligator-clip method of tapping off signals from a radio can also be used with TV sets if you want to record the audio portion of TV shows. Again, put the clips on the speaker terminals in your TV set and run the line to your tape recorder input. As yet, no TV programs are broadcast in stereo, so you'll need only a single patch cord.

No matter which kind of hookup you use between your tape recorder and FM source, if you plan to do a lot of off-the-air recording, it's a good idea to leave all the cables connected permanently. Then you can stash them neatly out of sight, but you'll always be ready to roll whenever an interesting program is aired.

Suppose the Boston Symphony goes on the air at 8:30 and you want to tape the Haydn symphony they're playing as an opener. You had best be on the job by about 8:10, giving your rig a trial run just to make sure everything's shipshape for the conductor's first downbeat. Besides, the extra twenty minutes will give your equipment a chance to warm up to its task. A properly warmed-up tuner won't drift off the station and need re-setting—a calamity that could mar an otherwise perfect take. Besides, the drive motor of your recorder will run at more

(Continued on page 42)

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Audio (Oct. 1964) says it's "in a category all by itself."

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Harman-Kardon has extended the frequency response of the new Stratophonic receivers to include those frequencies at the bottom and the top of the spectrum which, though supposedly inaudible, have a profound effect on the living timbres of all music. At full usable power, response of the new Stratophonics reaches its peak far below and maintains its utterly flat plateau far

beyond the range of all other one-chassis receivers. What is more, not a single vacuum tube (not even a nuvistor) is used in any of the Stratophonic receivers.

Stratophonic prices: Model SR900 (illustrated), \$469; Model SR600, \$389; Model SR300, \$279. At these prices, practically *everyone* can afford Stratophonic Sound.

SPECIFICATIONS, Model SR900

IHFM music power: 75 watts • Frequency response: 2 to 100,000 cps ± 1 db at 1 watt (normal listening level); 5 to 60,000 cps ± 1 db at full power • Distortion less than 0.2% • Usable FM sensitivity: 1.85 μ v IHFM • All-transistor front-end FM circuit for optimum selectivity and sensitivity • Damping factor: 40:1.

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Adding Sound To Your Slides

by Harold Weiler

Combining slides and sound on tape is perhaps one of the most effective means of adding dimension to both. Slides can be used to augment sound to give a greater memorability or for dramatic emphasis. Sound when added to a slide show dramatizes the context of a script, provides a sense of reality and motion to slides which their projection alone does not provide and makes for a better show.

When two slide projectors and a fading unit are combined so that succeeding slides fade into each other without abrupt change, a continuous tape commentary or a musical and sound effects background leave the audience with a sense that they have been watching a sound motion picture. Best of all, this combination can be produced at a fraction of the cost of a motion picture. It also has the advantage that it can be easily edited or changed for various audiences by the addition or deletion of slides and a simple re-taping job.

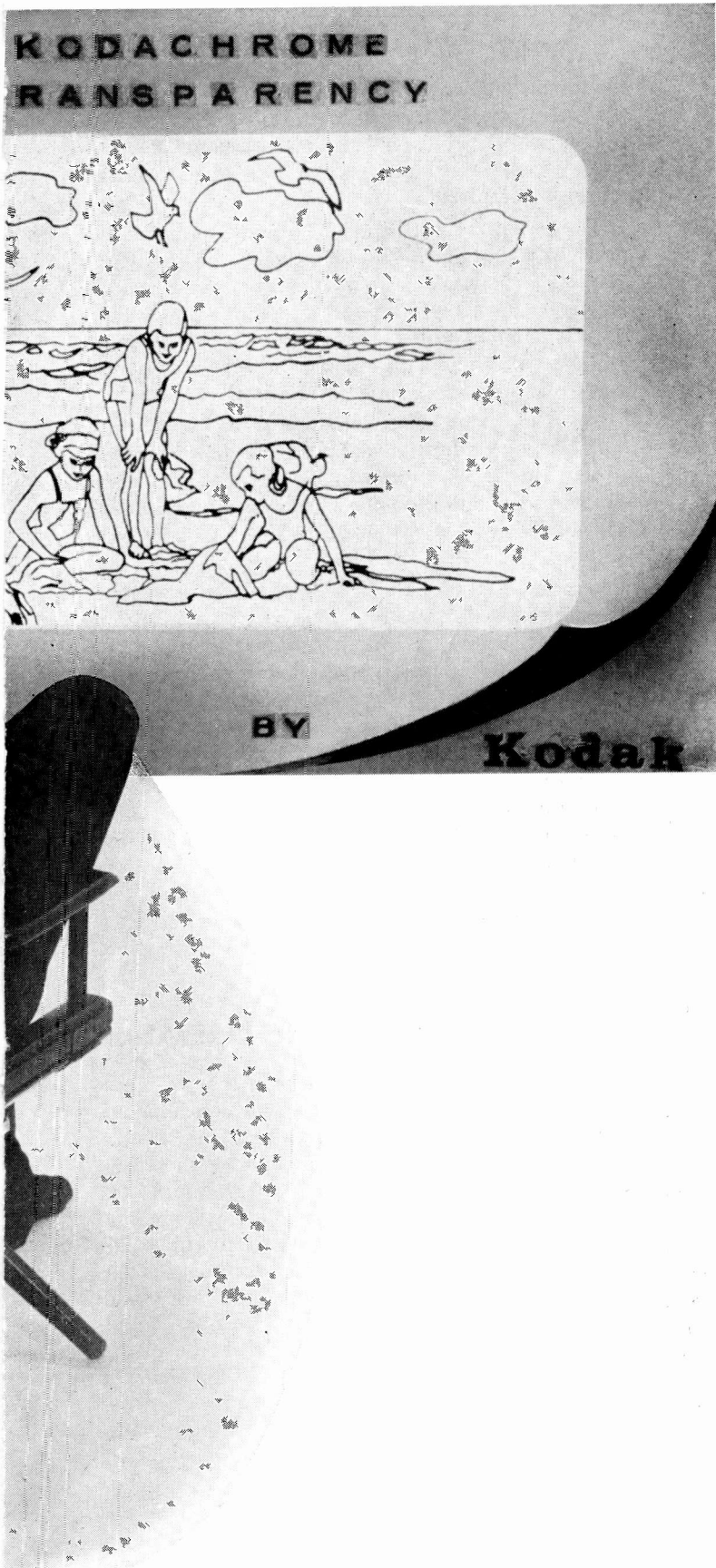
In its simplest form a slide-tape show utilizes a single slide projector and a tape recorder.

The first step in adding sound to a group of slides is to select those which best illustrate the story you wish to tell. Arrange them in some order. It may be chronological, geographical or in any appropriate order. Number the slides in sequence. Obtain a number of 3x5 inch file cards and mark them with numbers which correspond to those on the slides. We employ cards rather than sheets of paper to eliminate any possibility of recording annoying paper rustling as you read the notes they will eventually contain.

Next decide on the total length of the presentation. No single showing should be longer than twenty minutes if you wish to retain the undivided attention of your audience. In fact, 15 minutes is even more effective. When the program is longer it should be broken into 15 or 20 minute sections. No individual slide should remain on the screen for longer than 25 to 30 seconds unless it is highly detailed and requires a longer description.

Your slides are now marked in sequence. Project them and at the same time start your tape recorder. Just before you begin to speak, tap an empty water glass with a spoon or a pencil. Then describe the slide on your screen in a normal manner.





After you have completed your commentary for that particular slide tap the glass again. This sound is a signal which will tell you exactly when to change slides. When making this recording you need not be particularly careful with your commentary since its purpose is to obtain a rough description on tape. Get all of the facts relative to the picture on the screen, in this recording. We are not, at the moment, interested in how long it takes. The writer has found this method more effective than writing the initial description.

Project the first slide of the group and listen to your recorded commentary. Do not be disappointed, for unless you have had previous experience you will find, as explained earlier, your description rambles, drags, repeats itself and is marked by awkward pauses. You do not sound at all like your favorite commentator. Do not feel too badly, for despite his experience he would probably sound exactly the same if he had to speak extemporaneously. The commentator invariably employs a previously prepared script. This is exactly what we intend to do.

As you listen to your recorded commentary, while viewing the slides again, make notes on the corresponding card, choose only the most pertinent remarks. Explain when and where the picture was taken. Try to anticipate the questions most likely to be asked by the viewers. If you know an interesting story about the person or scene, write it on the card. Guide books and travel folders are a good source of prepared commentary.

After this information is noted on the card, edit your comments so that you have approximately 60 words. At the rate of $2\frac{1}{2}$ words per second, the speed of average conversation, the commentary for each slide should take about 25 seconds. You may find it a little difficult at first to make your comments brief. However if you persist you will find it can be done with most slides. An exceptional one may require a hundred words while others can be described with 50 or less, but you will find that 60 words is a good average to use. This elimination of superfluous wordage will provide a smooth flowing, crisp description which is much more entertaining.

Aside from his confident delivery, you may feel that your favorite commentator has an exceptionally pleasant voice. This is not necessarily true, he has however learned to use a microphone to emphasize its best qualities and subdue others which may be less pleasant. You can do the same. You have an excellent tutor, your tape recorder.

You should now be prepared to make your final recording. Project the first slide and turn the recorder to the record-position. Start the recorder and make your signal sound. Carefully read the first edited commentary. When this is completed make the signal again and stop the recorder, marking the point at which you hear the ending signal with an orange china marking pencil. Play the entire section you

Adding Sound To Slides

have just recorded to be certain it is satisfactory and that the commentary is smooth. A recorder is absolutely ruthless in exposing the slightest stumbling or hesitancy. If you are satisfied with the result, measure $18\frac{3}{4}$ inches of tape from the last marked point if you are recording at $3\frac{3}{4}$ inches per second. If you recorded at $7\frac{1}{2}$ ips, measure $37\frac{1}{2}$ inches of tape. Mark this spot and by hand move the tape back onto the supply reel, one turn. This unrecorded length of tape allows you approximately five seconds to change the slide before the narration for the next one begins.

When you are ready for the next slide start the recorder again, as soon as the marked point on the tape arrives at the recording head make another sound signal and begin to read the commentary for the second slide from the corresponding card. Repeat this procedure until you have as many recorded sections as there are cards and slides.

This form of recorded commentary is the simplest you can make. With the projector and slides ready, start the recorder. At the first signal sound flash the first slide on the screen. Begin to change the slide after you hear the signal indicates that the narration is complete. Be certain that the change is completed before you hear the next signal, the point at which the narration for the following slide begins.

When employing an automatic projector without the slide synchronization feature, the procedure is essentially the same as described earlier. However, the timing of the narration is more critical. The recorded commentary must be timed to match exactly the change cycle. Set the projector timing for a 30 second interval and restrict your narration to an absolute maximum of 28 seconds. This allows two seconds of silence while the projector is changing slides. As originally explained, the tape should be marked when the narration is completed. With this type of projector you need only measure $7\frac{1}{2}$ inches of tape when recording at $3\frac{3}{4}$ ips and 15 inches if recording at $7\frac{1}{2}$ ips since the required time lapse is shorter; then mark the tape again. These marks and their accurate placement are extremely important if sound and slide synchronization are to be maintained throughout the entire showing. They are your only indication of when to begin the narration for the following slide.

If you use an automatic or semi-automatic projector which has provision for a slide synchronizer this attachment is an excellent investment. It permits you to vary the length of time each slide is on

the screen and consequently the length of the narration employed. Its use also eliminates the necessity for the sound signals and the measurement of tape, for it automatically changes the slide when the narration is completed.

The recording procedure is exactly the same as previously explained. However, when the narration for a slide is completed, a momentary contact switch on the synchronizer is pressed for a half second. This records a signal pulse on the tape. Your narration for the following slide should begin immediately upon releasing the momentary switch.

Upon playback, after your narration for the first slide is completed, the signal pulse previously recorded on the tape automatically activates the slide tripping mechanism on the projector thus changing the slide before your narration for the next slide begins.

You should now have or be ready to make a tape of synchronized narration. You may stop at this point, certain that the sound accompaniment to your slides is a finished product which will enhance each showing and which will, probably for the first time, allow you to relax and enjoy a sandwich and a drink, during the showing.

Alternatively you may continue on to create a slightly more elaborate and much more professional form which employs a musical background for your narration. This form of sound track is no more difficult to make but requires a little more time and preparation, and can be made with older recorders and projectors without the aid of other accessories. More on this in our next article.

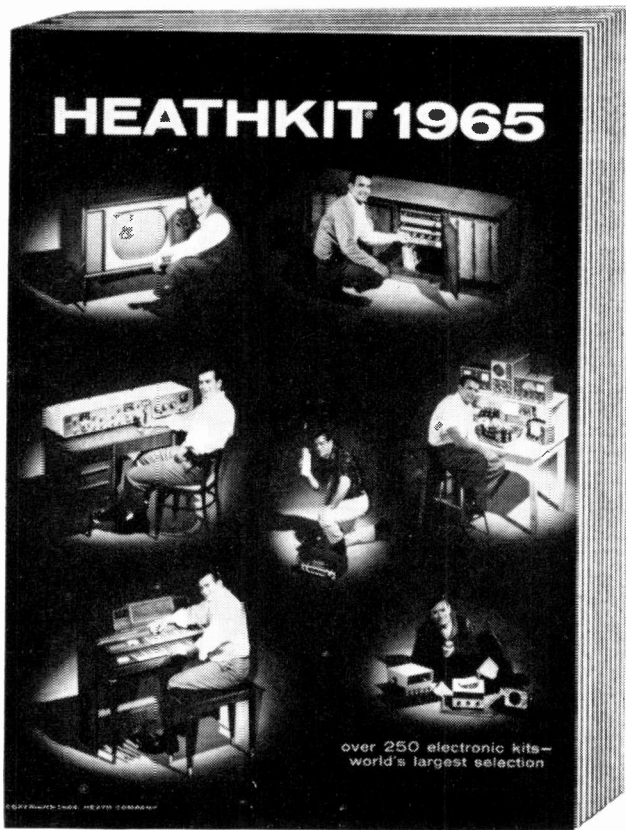
How to Improve Your Narration

The simplest recording to make is that of a single speaking voice. In recording narration, intelligibility and definition are of paramount importance. This simply means that the microphone should be placed fairly close to the narrator. A distance of one to three feet is usually correct for average conditions. The exact distance is dependent upon the acoustics of the room in which the recording is made. In a comparatively "dead" room, one with wall to wall carpeting and drapes and heavily upholstered furniture, the microphone should be placed closer to the three foot position to avoid the artificial, too intimate sound, characteristic of a room of this type. In larger or more "live" rooms, without hangings, rugs, etc.; the microphone should be placed closer to the one foot distance.

To determine the exact placement, for your particular voice, in the specific room you intend using, two simple test recordings are required. Choose a

(Continued on page 55)

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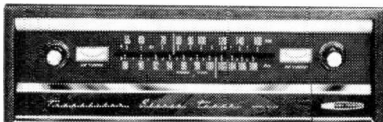
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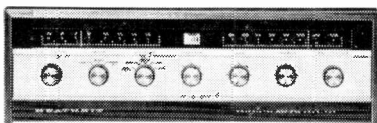
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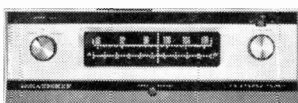
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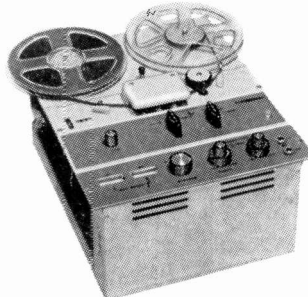


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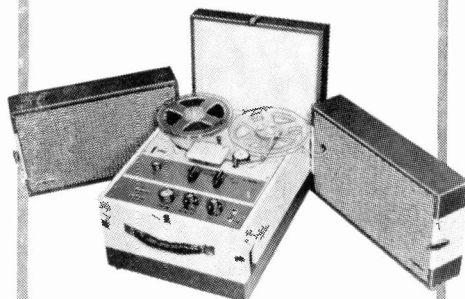


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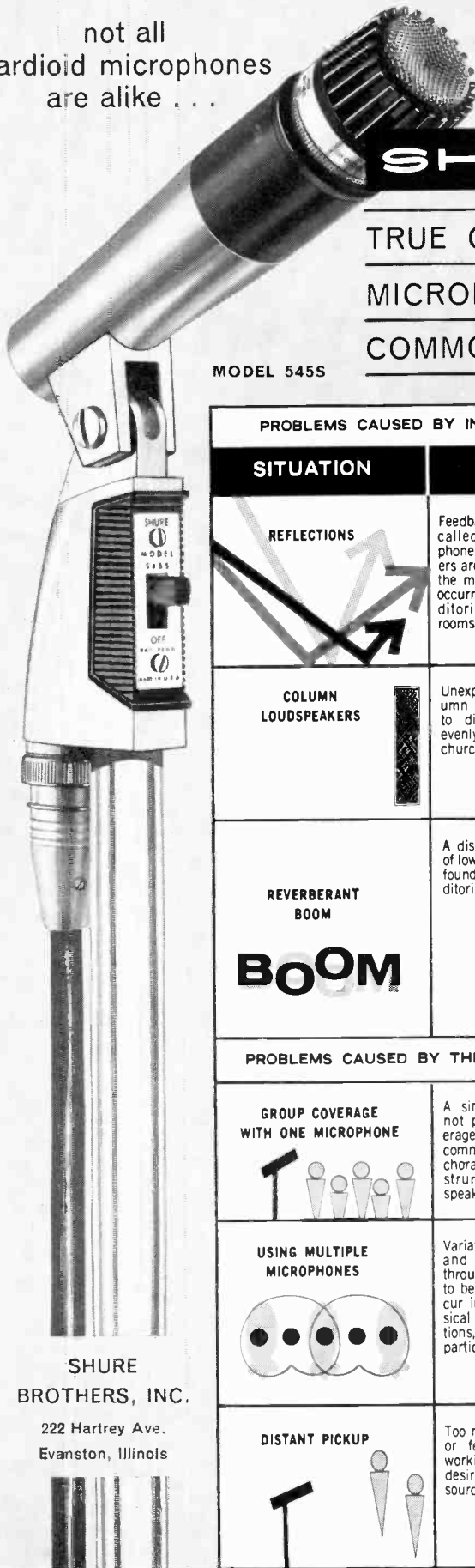
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MODEL 545S



PROBLEMS CAUSED BY INEFFICIENT REJECTION OF UNWANTED SOUNDS BY THE MICROPHONE			
SITUATION	PROBLEM	CAUSES	SOLUTION
<p>REFLECTIONS</p>	Feedback occurs where a so-called "cardioid" microphone is used and the speakers are placed to the rear of the microphone. A common occurrence in churches, auditoriums, and meeting rooms.	Sound bounces off hard surfaces on the walls, floor and ceiling, in and around the audience area and the microphone used is not effective in rejecting these sounds at all frequencies, and in all planes about its axis.	The Unidyne III eliminates this problem because of effective rejection of sound at the rear of the microphone with uniformity at all frequencies. Sounds bouncing off the floor or other reflective surfaces that reach the rear of the Unidyne III are rejected.
<p>COLUMN LOUSPEAKERS</p>	Unexplained feedback. Column loudspeakers are used to distribute sound more evenly to the audience in churches and auditoriums.	While column speakers direct the sound toward the audience, they also have side and rear sound lobes which may reach the microphone. Feedback occurs when the rear and side sound lobes of the speakers coincide with the rear and side lobes of a so-called "cardioid" microphone.	The Unidyne III solves this problem because it has no rear or side lobes. Thus it rejects the side and rear lobes of the sound column speakers.
<p>REVERBERANT BOOM</p> <p>BOOM</p>	A disturbing, echoing effect of low frequency sound often found in churches, large auditoriums, and arenas.	The particular "cardioid" microphone used fails to retain its unidirectional characteristics with low frequencies. In addition, its front response tends to accent low frequencies of the desired sounds. These factors result in pickup and reinforcement of the low frequency reverberation and boominess characteristic of many halls.	Using the Unidyne III Microphone will solve the problem because it maintains a uniform pattern of sound rejection in all frequencies, even as low as 70 cps. The frequency response also has a controlled roll-off of the low end. This prevents reinforcement of the low frequency reverberation and diminishes the effect of a boomy hall.
PROBLEMS CAUSED BY THE MICROPHONE'S INEFFECTIVENESS IN PICKING UP THE DESIRED SOUND			
<p>GROUP COVERAGE WITH ONE MICROPHONE</p>	A single microphone does not provide uniform coverage of a group. This is commonly experienced with choral groups, quartettes, instrumental combos, and speaker panels.	The particular "cardioid" microphone used lacks a uniform pickup pattern, so that persons in different positions within the general pickup area of the microphone are heard with varying tonal quality and volume.	The Unidyne III affords uniform pickup of the group with a resulting consistency in volume and sound quality among the members of the group.
<p>USING MULTIPLE MICROPHONES</p>	Variation in the pickup level and tonal quality exists throughout the broad area to be covered. This may occur in stage pickup of musical and dramatic productions, panels and audience participation events.	The pickup pattern of the microphones used is too narrow, causing "holes" and "hot spots". The off-axis frequency response of the microphones also varies.	The Unidyne III permits a smoothness in pickup as the true cardioid pattern gives broad coverage with uniformity throughout the coverage area. This eliminates "holes", "hot spots", and the variations in sound quality and permits blending many microphones with ease.
<p>DISTANT PICKUP</p>	Too much background noise or feedback results when working with microphone at desired distance from sound source.	So-called "cardioid" and particularly long range microphones being used are less directional with lower frequencies. In addition, they have lobes or hot spots that pick up sound at the rear, resulting in the background noise or feedback problem.	Use the Unidyne III to gain relatively long range with effective rejection of sound at all frequencies at the rear of the microphone.

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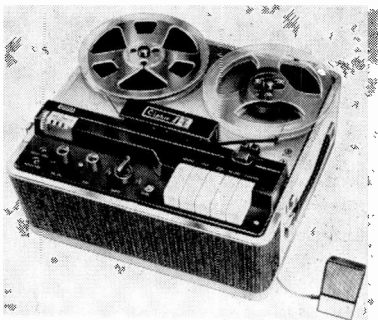
Manufactured under U. S. Patent D150, 864; Other patents pending

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tape

EQUIPMENT REVIEWS

Cipher I



This recorder may be the answer for the tape beginner who is more interested in value for his money than in stereo sound. While the suggested retail price is \$139.95, most dealers around the country already are selling it for less than \$100. What you get for your money is a three-speed monaural recorder mounted in a wood (not plastic) cabinet. The recorder comes with several accessories, including a dynamic microphone, earphone, patch cord, splicing tape and an empty reel. Features include instant stop and all-pushbutton operation.

Intermark Corporation, which distributes the recorder, makes no pretense that this is a high fidelity unit. Its frequency response claims of 70-13,000 cps at $7\frac{1}{2}$ ips are borne out by our tests. Response at the slower speeds, while not in the high fidelity class, certainly is adequate for the beginner in making tapes of family and friends, or recording music from radio or records for casual listening later. Here are our test results:

The company has been equally conservative in its figures for wow

& flutter. The former, in fact, was virtually unmeasurable at $7\frac{1}{2}$ ips, while the latter was 0.15%. The combined figure was 0.2%, a full half per cent less than the machine's published spec. Rewind time for 1200 feet of tape was a good deal less than the three minutes claimed by the manufacturer—in fact, only 2:22. Other figures include a signal-to-noise ratio at normal recording level measured by us at 32 db, both from the monitor output and the speaker output. We measured sensitivity Φ v u @ 1000 cps of 1.0 mv at the microphone and 250 mv for the phonotuner line. Total harmonic distortion record at -10 vu, $7\frac{1}{2}$ ips, amounted to 4.5% at the monitor output and 4.9% at the speaker output.

We found the machine to be quiet in operation. The instant stop is positive. A record interlock prevents accidental erasure of recorded material. When the tape is in either of the high wind modes, a tape lifter removes the tape from the heads. Unfortunately, there is no end of tape break shutoff switch. The accessories are adequate to get the newcomer to tape started, and all else that is needed to have a complete, useable system is a reel of tape. The controls are easy to operate and fully control the recorder, the speed selector being especially effective since it allows speed change during operation or with the recorder turned off. The piano key function controls are firm and require positive operation.

All in all the Cipher I is a neat, complete package which would make a fine tool for a student or beginning tape hobbyist on a budget. The recorder worked well and easily in the hands of a 13-year-old, giving clean, crisp voice recordings. Playback of recorded tapes was most satisfactory. We found the instruction book adequate—but would warn purchasers of the Cipher I to read it through before trying to operate the recorder.

Concord 330



This two-speed battery-operated mono portable (it weighs only six pounds) has many features for use as a business machine for recording reports, conferences, etc.—and it has several features which make it desirable for other applications. Two of these are automatic slide advance and automatic movie synchronizer. Its minimum resale price is \$149.50 and other features include automatic stop during playing when sensing tape has been applied to the tape, VU meter, remote control start-stop switch on the microphone.

The recorder can take any five-inch reel of tape and operates at $3\frac{3}{4}$ ips and $1\frac{7}{8}$ ips, which gives it a total recording time of up to six hours per reel. Speed change is accomplished by using a slip-on capstan for $3\frac{3}{4}$ ips operation. When not in use, the capstan is stored conveniently out of the way.

Signalling to a slide projector or to provide for auto-stop is accomplished by means of metallic tabs placed on the emulsion side of the tape. It was found that these tabs, to work the auto-stop and slide synch had to be just under $\frac{1}{4}$ " in length for the $1\frac{7}{8}$ ips speed. Longer tabs remained on the signalling contacts and overrode the start command.

The voice actuation feature makes

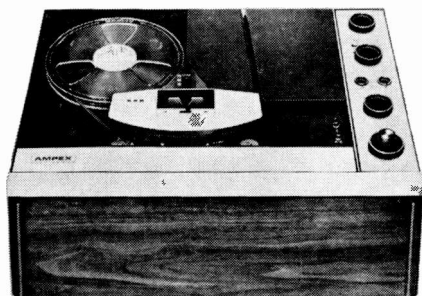
the recorder an ideal portable notebook, although the activation mechanism of necessity clips off the first word or two when the machine starts. In addition, there is no provision for backup of the tape to facilitate transcription by a stenographer. Nevertheless, we found the recorder quite adequate for recording business conversations and conferences and for electronic note-taking.

What about performance? We found comparatively low wow & flutter figures: 0.4% and 0.8% respectively at $3\frac{3}{4}$ ips, with a combined figure of 1.2%; slightly less at $1\frac{7}{8}$ ips. Signal to noise ratio, measured at 1000 cps and normal recording level, was 40 db at $3\frac{3}{4}$ ips and 46 db at $1\frac{7}{8}$ ips. Total harmonic distortion, on the model we tested, was 4% at normal recording level. It took this model two minutes and 57 seconds to rewind 600 feet of tape. Fast forward was slower, taking five minutes and 20 seconds for the same amount of tape.

The accessories provided with the 330 are a microphone with start-stop switch, earphone, sensing tabs, speaker extension cord, line input cord and carrying strap. An AC adapter is available as an optional accessory. Six D cells power the recorder, and the VU meter doubles as a check on their condition. The instruction book is both comprehensive and detailed, covering a number of possible uses for the machine. In addition to explaining the location and function of all the controls, it discusses adding sound to motion pictures and synchronizing slides and sound.

A high fidelity component this isn't. But it is an amazingly versatile recorder for the student or the businessman.

Ampex 2070



The Ampex 2070, at \$499, may just be the recorder for people who hate tape recorders. It is designed to thread itself, to reverse tape direction at the end of each reel, in short to do just about everything except turn itself on (it does turn off automatically). How does it do all of these things? And how efficient is it?

Self-threading, the machine's most distinctive feature, is accomplished by means of a unique take-up reel with a hub of teeth mounted on a single flange. A cover containing a slot into which the tape is dropped hides the reel from sight and simplifies its operation. When tape is dropped into the slot, the teeth grab it, looping it automatically around the hub for standard operation. The whole assembly can be removed if desired and an ordinary reel substituted.

Triggering the automatic reversing mechanism is a 20-cycle reversing tone which must be recorded directly on the tape. The recorder comes equipped with the device for generating the tone, which makes it possible to apply it to tapes already in one's library, or to commercially-recorded tapes (some recent Ampex recorded tapes already carry such a tone). The reversing action is rapid and positive. Reversal tones can be removed from the tape by the recorder's own erase head.

Like most recorders in its price range, the Ampex 2070 records and plays back four-track monaural and stereo tapes. It can be used to play two-track and four-track tapes as well, and operates at three speeds— $7\frac{1}{2}$, $3\frac{3}{4}$ and $1\frac{7}{8}$ ips. The machine loses its automatic threading feature when making recordings. It's necessary to use a standard takeup reel, so that reels can be switched at the end of the first track.

The machine uses three heads—a single erase head, mounted between two record/playback heads. The head mount is a precision block machined to give precise, permanent alignment of the heads. However, because of the location and type of heads used, the machine can be used to record in forward mode only, although it plays back in either direction. A unique feature of the unit is its dual capstan system, which assures proper tape tension and guidance regardless of the direction of

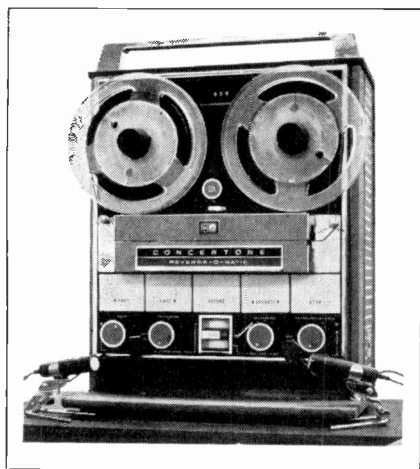
tape travel.

The direction lever, which determines the direction of tape travel in the normal or fast wind modes, is located in the center of the head cover. The normal and fast wind mode controls are located just above the direction lever. Above these is located the speed selector and to their left is the counter. The recorder responds quickly and gently to these controls. The amplifier controls are at the right side of the recorder, arranged vertically. At the bottom is the volume control for each channel, then a ganged tone control, the recorder indicator lamps (the unit uses neon bulbs in preference to VU meters), the mode selector switch, and at the top the stereo/mono switch. The mode selector switch has a spring-loaded position for placing reversing tones on the tape.

Now, about performance. The Ampex 2070 met or passed its performance specifications with ease. For example, its wow & flutter compare favorably with some of the better professional machines. At $7\frac{1}{2}$ ips, the figures were .01% for wow, .045% for flutter, for a combined figure of .05%. Even at $1\frac{7}{8}$ ips the readings were .2%, .1% and .2% respectively. Combined record/playback response at $7\frac{1}{2}$ ips is 30-15,000 $\pm 2\frac{1}{2}$ db; or 40-5300 cps ± 5 db. Rewind time for a 1200-foot reel of tape is slightly less than two minutes; the same for fast forward. Signal to noise ratio from 3% THD was rated by us at 50 db for the left channel; 48 db for the right.

The microphone jacks are located conveniently on the front of the recorder. The line inputs, preamp outputs, external speaker jacks and the projector actuator jack are located on the rear of the unit and are labelled clearly. Studs for cord storage are provided. Also supplied was a single Ampex model 2001 microphone. Presumably the buyer must purchase a second microphone if he plans to do any live stereo recording. While the instruction manual is complete, it is by no means clear. Some parts are unidentified in the drawings; instructions on how to make certain types of recordings are incomplete. One would think buyers of a tape recorder in this class are entitled to a better instruction book.

Concertone 801



The Concertone 801 two-speed recorder offers a number of interesting features at a price that's right for the serious audiophile—\$450—such as six heads, three motors, solid state construction and automatic reversal. It thus is ideally suited for providing uninterrupted programming for long periods of time without attention.

But what about performance? In some respects, the Concertone 801 received by our testing lab actually exceeded the published specifications. The manufacturer, for example, claims a signal-to-noise ratio of 50 db. Our test results showed that the figure was more like 55 db for the left channel, 52 db for the right, at a reference of 3% THD at 1000 cps. Rewind time for 1200 feet of tape is listed by the manufacturer at 45 seconds. Our sample unit did it in 40. As for other characteristics, we found wow & flutter at 7½ ips to be 0.1% for the former and 0.24% for the latter, or a combined rate of 0.3% in the forward mode. Operating in reverse, the machine did nearly as well: 0.13% wow, 0.23% flutter and a combined figure of 0.34%. The figures for 3¾ ips operation were even better—0.07% wow and 0.25% flutter, or a combined figure of 0.27% in forward mode; 0.1%, 0.2% and a total of 0.26% operating in reverse.

Other statistics of interest are those

for sensitivity (at VU record level @ 1000 cps, the microphone reading was 3.5 mv per channel. Line sensitivity was 234 mv for the left channel and 240 mv for the right. On the sample received by us for testing, the total harmonic distortion, recorded at -10 vu and 7½ ips was as follows:

	Left channel	Right channel
1000 cps	1.75%	2.2%
100 cps	1.5%	1.7%
10,000 cps	2.4%	3.0%

The unit's six heads include two each for record, playback and erase. Features in addition to the automatic reverse—which we found efficient and trouble-free—include true sound-on-sound recording, proper tape monitoring facilities, push-button controls to operate record, playback, fast forward and reverse and start-and-stop. These are large and easily distinguishable, but a bit noisy in their operation, probably due to the large area in contact with the front stop as the buttons move from the depressed position. The knobs controlling volume, balance, etc. are large and easy to use. Though there is no indicator to warn of being in the RECORD mode, it's difficult to erase a tape accidentally because of the sequence of control operation. Cueing by depressing both FAST WIND buttons simultaneously places rather high stress on the tape, probably too much for thin tapes. Tape pack in the normal forward and reverse modes was good. Reversing operation was smooth.

Live recordings with the dynamic microphones supplied with the recorder had a nice clean, crisp sound. The instruction book was clear and amply illustrated, and covered the operation of the recorder very thoroughly. The diagrams could have been larger, but are adequate for the user. The Concertone 801's packing was superb. It comes inside a polyethylene bag, bedded in beaded polystyrene packing inside an inner cardboard carton. The physical condition and appearance of the recorder when unpacked was excellent.

Norelco Carry-Corder



What's the best way to test a battery-operated tape recorder whose chief virtue is simplicity of operation? What TAPE RECORDING's test labs did was to put aside the oscilloscope and the other tools of the trade and turn the Carry-Corder over to a 14-year-old tape novice. Assignments: read the instruction book, take the recorder to the theatre, walk around Manhattan and come back with some interesting material. Herewith Our Girl Saturday's report:

"The Norelco Carry-Corder is a lot of fun to operate. It weighs only three pounds, although it feels heavier. But it comes in a leather-type carrying case, which makes it easy to handle. I put the batteries in myself, following the diagrams inside the recorder. I got the cartridge in the right way the first time, although the instruction book doesn't tell you which way it goes in and the cartridge doesn't either. It would be helpful if the cartridges were numbered on each side, like records are. You don't have to thread this machine like you do with the big ones. You just push the cartridge into place, and you're all set.

"The microphone is easy to handle and has a remote control switch on it, so you can start and stop recording without touching the recorder itself if you want to. There is one control for record, playback, fast forward and reverse. You push a red button as well as the record control to record. There are separate volume controls which I set too high for most of my recordings. A meter on top of the machine shows whether you're recording too loud. It also shows if your batteries are all right.

The cartridge holds 30 minutes' worth of tape. When you come to the end, it stops. Then you have to take the cartridge out and turn it over. You can then record for another 30 minutes. I liked it. It was fun."

To which we'd like to append some notes of our own. Power for the recorder is provided by five C cells, or an AC adapter (not provided) can be used both to power the unit and change its batteries. Norelco claims that battery life is about 20 hours. We have passed that point and still find the batteries useable. The cartridges are equipped with 300 feet of triple play tape only 0.15" wide. At a speed of $1\frac{7}{8}$ ips, this provides 30 minutes' uninterrupted recording and playback time. Rewind time on the Carry-Corder is quite fast—approximately 65 seconds for 300 feet of tape.

We discovered that recordings made on the Carry-Corder sound significantly better when played back through a component high fidelity system (a patch cord is supplied for this purpose) than when played back through its own 2" loudspeaker. The latter has a tendency to rattle with certain types of program material. We found that recordings of speech—whether made from the balcony of a legitimate theatre or surreptitiously in a living room—were much more successful than recording of music or sounds. The latter tended to distort, perhaps because our youthful assistant recorded at too high a level. Choruses and orchestral passages from a Broadway show tended to blur and distort rather badly, too, while spoken passages from the same show were recorded clear as a bell. The omnidirectional microphone, unfortunately, picked up a good deal of coughing and program rustling as well as the show.

What about recording music off the air? You can do it easily with the Carry-Corder — but the results, as played back through the unit's small speaker, are equal in quality to those from a \$30 or \$40 transistor radio. The Carry-Corder thus becomes ideal as a companion to the beach or on picnics. For recording street sounds — construction near Rockefeller Center, a New York subway train—the Carry-Corder is at best

quite good and it really shone in one recording of a street Santa Claus ringing his bell and an ambulance tearing across 42nd Street. All of these recordings sounded much better played through a large speaker system. Wow & Flutter, rated by the manufacturer at 0.35%, are well below the limits where they're noticeable to the ear.

Finally, the Carry-Corder is distinctly more reliable than many other battery-operated portables, and certainly more than most others selling for less than \$140.

Wollensak 1280



The Wollensak Model 1280 is a 4 track, dual speed stereophonic tape recorder/reproducer. It has dual matched amplifiers incorporating record/playback pre-amplifiers—providing three watts of power per channel. It can be operated in either the vertical or horizontal plane or any position in between.

Additional features of the 1280 include VU meters, independent volume and tone controls on each channel, automatic tape lifters in fast forward and rewind modes and built-in reel locks. The tape lifter mechanism is driven by a rubber tired cam and has a smooth, fluid like action which is very gentle with tape. A removable plastic strip at the bottom of the loading slot permits easy cleaning and degaussing of the heads and quite good access for editing.

The Wollensak 1280 tab control panel and independent channel circuitry provide flexibility and ease of operation. Four finger tip tabs control On-Off/tape speed, forward tape travel and record/play functions of each channel. The functional and unique tab control sys-

tem, while different from the control system found on most recorders will require some familiarization on the part of a new operator. The tab system allows one to record on both channels simultaneously in stereo or on either channel separately in mono. Since the tape travel tab operates independently one can set the recording levels and channel balance before starting the tape in the record mode. The machine with its interlocked controls affords easy operation, flexibility of performance and quality sound. The controls are so interlocked as to make it almost impossible to erase a previously recorded tape, but no indication is present that one has accidentally gone into record mode.

The Record/Monitor switch controls the output of the recorder's speakers so that during recording the speakers may be turned off to avoid acoustic feedback. With the switch in the monitor position one can monitor the signals being fed to the recorder, allowing monitoring of the program material being recorded. This is desirable for recording radio programs where one might wish to "active-edit" using the instant stop lever.

The high speed search lever is used to rewind tape or to fast forward to a previously recorded portion of a tape. It is interlocked to prevent operation when tabs are in record. Tape speed may be changed whenever desired, except during rapid forward or rewind operation.

Our tests revealed the 1280 to be a recorder which offers value for money. Record/playback response, measured at $7\frac{1}{2}$ ips, was 50-15,000 cps ± 5.2 db for the left channel, $+9$ db for the right. At $3\frac{3}{4}$ ips, the readings were ± 3.8 db for the left, ± 4.8 db for the right. Wow & flutter figures at $7\frac{1}{2}$ ips were .09% wow, .14% flutter and a combined figure of .18%. At $3\frac{3}{4}$ ips the figures were .23%, .27% and .3% respectively.

Rewind time per 1200-foot reel was two minutes and 12 seconds—while fast forward for the same length of tape takes only one minute and 34 seconds. Other test results showed satisfactory readings for sensitivity, harmonic distortion and record level. (Continued on page 58)

tape

CLINIC

Q. What's the difference between A-wind and B-wind? Is it true that B-wind produces higher fidelity?

*Daniel Katz
Chicago, Ill.*

A. A-wind and B-wind are terms belonging to the very earliest days of tape recording, and refer to whether the oxide on recording tape is wound outwards or inwards. All of today's raw and prerecorded tapes are A-wind. B-wind tapes simply show dull oxide on the outside before they're unsealed. A half-twist of the tape converts one to the other.

As to the relative fidelity of the two types, there's a misconception popular in Europe that B-wind is superior. Since the only difference between the two types is the location of the recording and playback heads in regard to the tape, there can be no difference in fidelity, assuming tape and heads of equal quality. The reason that American (and virtually all other) manufacturers standardized on A-wind was the belief that the exposed portions of B-wind tape can become scratched or damaged. Since A-wind tape has no such exposed portions, it has come to be accepted as the standard.

Q. I'd like to use the tone controls and filters on my amplifier to compensate for deficiencies in records when I'm transferring to tape, but the tape output bypasses all these controls. What do you recommend?

*Richard Minton
Long Beach, N. Y.*

A. One way is to tap the cable to your loudspeaker, using a patch cord equipped with alligator clips, rather than using the tape output. The best places to make such a connection are at the leads to the speaker terminals,

at the speaker taps on the amplifier itself or (if the speaker isn't mounted in an enclosure) to the wires which connect the speaker magnet to the cone and frame. When you've made such a connection, all the controls on your amplifier become operative, including the volume control. When making such a connection, be sure that the alligator clips don't touch each other or any metal which could ground them. Remember, too, that the farther you go from the output stage of your amplifier, the more chance you have of picking up distortion—and that tapping the wires in a speaker introduce all the distortion and idiosyncracies of that speaker. However, with certain types of recording—i.e. 78 rpm transfers—it may well be worth it.

Q. I am the proud new owner of a used two-track stereo recorder. Is anybody still making two-track stereo prerecorded tapes? How much do they cost?

*Sheila Balfe
Shaker Heights, Ohio*

A. The biggest library we know is that of Livingston Audio Products Corp. If dealers in your area don't carry them (and most don't these days), you might try the company direct at Route 46, Parsippany, N. J. Livingstone has approximately 100 two-track stereo tapes, most of them 30 minutes long. These include symphonies, dance and mood music and some folk music items and sell for \$11.95.

Q. I've noticed a lot of references recently to low noise tape. Is it something new? Does it have advantages over regular recording tape?

A. Even top quality standard re-

ording tapes contain a background noise which can usually only be heard when tapes are played at top volume, when recording level is very low, or occasionally between recorded selections. Manufacturers have reduced this tape hiss in the past few years to a level where it never bothers the average home user.

Not long ago Minnesota Mining developed a tape which dramatically reduced tape hiss. Other manufacturers followed suit. These low noise tapes are being sold at a cost about 25 per cent higher than that for standard audio tape. They are of value to the serious recordist who owns high-priced high fidelity equipment, and improve fidelity when recording music at slower speeds. Low noise tapes are likely to make little difference in sound quality to most owners of low-priced recorders.

Q. Recently had a request to make 12 copies of a tape recording but don't have the facilities. Do you know of any commercial firm which would duplicate such a small number?

A. There are several reliable tape duplication firms scattered across the country, some of whom are geared to handle small jobs such as this one. You might try National Tape Service in Parsippany, N. J.; Terry Moss, 1908 California St., Omaha, Neb.; or Magnetic Tape Duplicators, 7925 Santa Monica, Los Angeles, Calif.

Q. What's the difference between a "transistor" recorder, and a "transistorized" recorder?

A. An all-transistor tape recorder, obviously, uses transistors throughout to replace tubes. The same is true of a transistorized tape recorder (although the latter may not be *completely* transistorized. Only a careful reading of the specifications will reveal this).

World's Largest Language Lab

by Richard Ekstract



When the University of Friendship of Peoples opened in Moscow on October 1, 1960, it featured what Rector Sergei Runyantsev called the world's largest language laboratory. Friendship University needed a large language lab because its students are almost all young people from underdeveloped nations in Africa, Latin America and Asia who have come to Moscow to study medicine, engineering, sciences such as geology and mathematics, and the humanities. And while their native tongue may be anything from Bantu to Spanish or Tagalog, all of the courses at Friendship University—except language—are taught in Russian.

Friendship University is an idea of former Premier Nikita Khrushchev's. It provides free tuition, medical care, clothing and spending allowance, dormitory, and travel expenses both ways for some 3500 qualified students from underdeveloped nations. You don't have to be a communist to qualify—but it helps. The idea was to woo these students away from American or British universities where they would have to pay their own way.

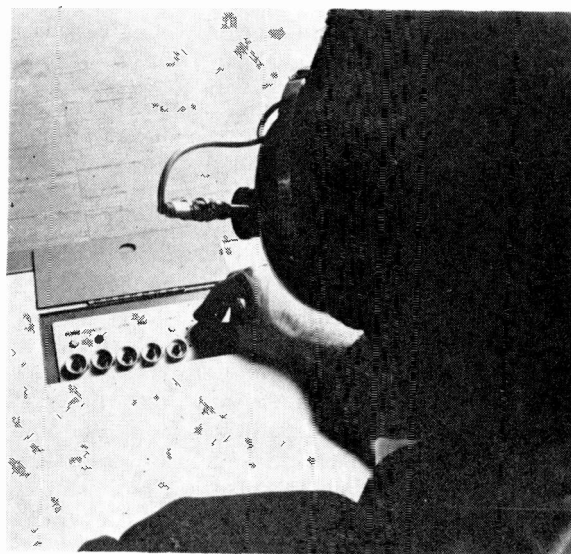
Although Friendship University is designed primarily as an educational institution—it's housed in a former school for army officers—it also serves an important propaganda function. Khrushchev himself let the cat out of the bag when he told the school's first 500 students, "If you would like to know my belief, I won't conceal it. I am a Communist. If some of you come to the conclusion that such ideology is to your liking, we shall not be angry." The *New York Times*, speaking editorially, saw Friendship University and its all-important language lab as a potential threat to democracy in the future because the school would attract tomorrow's uncommitted leaders of emerging Africa and Asia away from instruction in the West.

A student at Friendship spends all of his first year studying Russian—in some cases with an individual instructor, because of the wide variety of tongues and dialects spoken by students. Following this first year, he receives a regular four-year college course in science, engineering or the humanities, all of it taught in Russian by regular Soviet instructors (medical students receive a fifth year of training).

During that first year, the instructors use every teaching device there is to make the student not only proficient in conversational Russian, but with the technical terms he's likely to encounter during his following years of study. Tape recorders are used to



Students from Africa and Asia predominate at Friendship University.



Students get lessons in Communist ideology mixed with their language training.

World's Largest Language Lab

help the student learn proper pronunciation and to enable him to study by himself while the instructor is working with other students. No details were given by Professor Rumyantsev on the size of the laboratory other than the claim that it's the world's largest. Number of units, the length of time each student spends in the laboratory each day, and details on the equipment itself are unavailable.

After four years, it's evident that the language lab has been doing its job. The ratio of students flunking out because of inability to keep up with the class is slightly higher than one in 100—despite the fact that the classes are similar in content to those at Moscow University, where Russian students and American exchange students have similar curricula. For whatever reasons, the rate is dramatically lower than that for the language department of the average American university. One reason for the difference, according to the Soviets, is that students are provided with both the incentive to study and the opportunity to practice what they've learned.

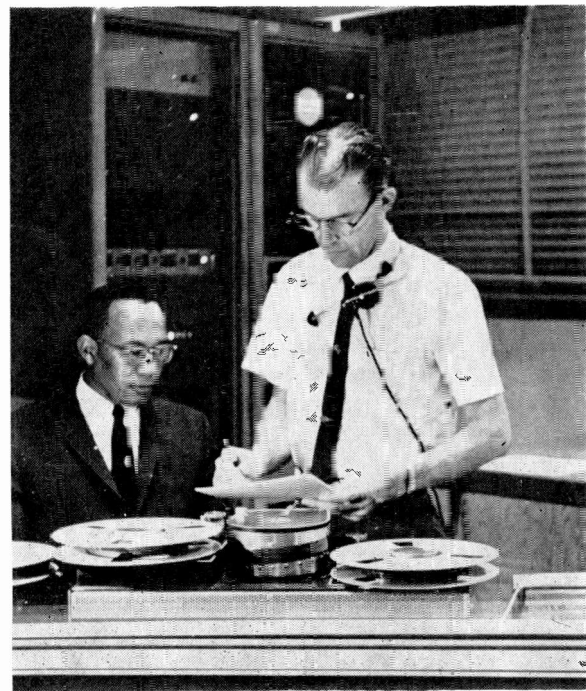
The language lab serves an important propaganda function, as well. Students learning a new language have to read something—so they're given the works of Marx and Engels. Conversation periods, according to one African student who dropped out, include discussion of world affairs from a definite pro-Soviet point of view. "I told my instructor at one time that she was trying very hard to indoctrinate me. She did not deny it. She told me that it was her job to indoctrinate me." This political orientation in language instruction has been an important factor in persuading some African and Asian students to return home before graduating, or to transfer to universities in West Germany, Britain and the United States.

There seems to be little question about the effectiveness of Friendship University's ability to teach a foreign language—an effectiveness not matched by any American university, although none have the same comprehensive type of instruction. On the other hand, the U.S.S.R.'s barely concealed attempts to subvert students from unaligned countries has annoyed both the students and their countries.

Has tape helped the Russians to steal a march on us? If so, how long can we allow this situation to continue? With the advanced tape recording equipment we have, the United States should be able to boast of having the world's largest language laboratories. We should take the lead in training students from the undeveloped nations in the fundamentals of democracy. It's up to each of us to request more and better language lab equipment in our schools—now.



Texts carefully prepared by Russian instructors reportedly are heavily laced with Communist propaganda. Whether for this or other reasons, each student receives much more individual help than is the case in American universities. Each lab station includes tape deck, earphones and dual controls for operation by student or to permit instructors to monitor their progress. Exercises include readings from Gogol, Ehrenberg and other prominent Soviet literary figures.



If videotape equipment of this nature is being used at Friendship University, it would indicate a hefty investment on the part of the Soviets in the latest type equipment for educational purposes.

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Taping FM Stereo

(Continued from page 26)

constant speed once its temperature is stabilized and its lubricants sloshed around a bit.

Be finicky about tuning in your station. For stereo, it's got to be right on the nose. Otherwise you lose stereo separation and the sound gets fuzzy. Don't rely entirely on the visual tuning indicator, if your receiver has one. Always confirm the accuracy of your tuning by ear, rocking the tuning knob back and forth until you get the clearest sound. Also, in the interest of sonic clarity, a quick dab of cleaning fluid on your tape recorder heads will prevent dull, muffled tapes due to dirt-clogged head gaps.

Next set the gain controls on your recorder for the proper level on both channels. Use as your test signal for this adjustment whatever program your station happens to be broadcasting before the concert. Most stations try to keep the transmission level constant between one program and another. So if the recording level on your recorder is set correctly before the concert, chances are that it will be correct during the concert. Commercials, however, frequently are broadcast at a louder level than the rest of the programs—so don't set recording levels while a commercial is on.

That Haydn symphony coming on at 8:30 won't last longer than half an hour. So a standard 1200-foot reel of tape running at 7½ ips will catch it all. Always try to estimate the music's playing time. One of the saddest sights is a recordist's face as he watches his tape run out in the middle of a once-in-a-lifetime performance. Some program bulletins published by FM stations give the timings for the various pieces of music. Otherwise, you can make a rough guess at the length of a symphony by checking in the Schwann record catalog how many sides it takes up on a recording, allowing about 25 minutes per LP side. Always load more tape on your recorder than you think you'll actually need. It's simple enough to clip off the excess later, and it's the only insurance against the loss of an irrecoverable program.

An adequate tape supply is rarely a problem. At 7½ ips, you get a full hour's playing time (in each direction) on a 7-inch reel of double-play tape. There are less than a dozen symphonies that long. In case of especially long-winded works, you can flip over the reels when the orchestra pauses between separate movements. With a little practice, you should be able to complete a flip in five seconds flat. Some recordists keep a second pair of reels already threaded next to the recorder, ready to slap on the machine when the music reaches a convenient stopping place. By using these "standby" reels they can shave a second or so off their flip time. Besides, it

assures that tape is recorded in one direction only, which facilitates later editing.

Of course, you can double the playing time per reel by recording at 3¾ ips. Sure, you might lose some highs, but modern recorders perform so well at this slower speed that the loss is not appreciable. Network broadcasts, for instance, rarely contain enough high frequencies to make the loss noticeable. But in case of locally originating programs or programs broadcast from tape, the 7½ ips speed might provide a discernible margin of quality.

In any case, keep in mind that what really counts is not the total playing time per reel (i.e. playing time in both directions) but the *uninterrupted* playing time (i.e. playing in one direction only). The orchestra won't stop in the middle of a movement just because you have to flip your reels.

The clock creeps toward zero hour. Start your machine about 20 seconds before broadcast time, so you'll be sure not to miss anything. You can always cut out that commercial later. Once the program is on, keep an eye on the recording level meters. If the level seems a little high or low at first, just let it go. Chances are that the engineer at the station will correct it. But if the engineer is asleep at the switch, by all means adjust the signal level. But do it discreetly. Turn the knobs very gradually, and turn both channels simultaneously. A good trick used by veteran broadcast engineers is to follow the expression of the music while you do it. If you must raise the volume, do it during a crescendo, hiding your maneuver under the natural swell of the music. Conversely, lower the recording level in a passage where the music naturally subsides. Frequent volume changes give the recording a broken up feeling. The best recordings are those with the least amount of knob twiddling.

At the end of a live musical broadcast, don't snap off the recorder at the last note. You might amputate the fading reverberation of the last chord, ending an otherwise fine performance with a jolt. Wait for the applause or the announcer to follow the music, then slowly fade out both channels in tandem.

In recording non-musical programs off the air, a good rule is to let the recorder run through everything. Don't start and stop the recorder to edit out stretches you think you don't want. You can always do that later, and you'll have a chance to decide at leisure what you want to keep. If you missed something in the original taping that turns out to be necessary for continuity, it's gone for good.

In The Next Issue

- The International Tape Underground
- Tape Teaching—Does It Work?
- Eight Track Stereo
- Tips From The Pros

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Circle 18 on Reader's Service Card

Inside Microphones

Here's a handy guide to microphones suitable for use in recording in the home. To select the proper microphone, try to find a use similar to the one you have in mind listed under one of the pickup patterns (listed

across the top of the chart). The use to which you plan to put the mike determines the type you'll need. The price you should pay for it depends on the quality of sound you want in your finished recording.

	Omnidirectional	Cardioid	Bidirectional
Price range	\$9-\$15 for crystal \$12-\$105 for dynamic	\$5-\$25 for crystal \$15-\$150 for dynamic	\$50-\$150
Uses	Recording business conference with single mike Recording on-the-street interviews Recording sound effects where there is no background interference for dictating in quiet room making letter tapes with a group	recording voice against background noise eliminating feedback from public address or recorder loudspeaker recording vocal groups in studio for dictating in noisy room making letter tapes with only one voice recording music or drama during performance	Studio recording of interviews Recording of piano-violin duets (or other similar duets) reducing feedback in difficult situations

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tape

REVIEWS

Beethoven

Concerto in D for Violin, *Joseph Szigeti, violin; London Symphony Orch. cond. Dorati, Mercury STC 90358, \$7.95*

◆◆◆ Music
◆◆◆ Performance
◆◆◆ Recording

This recording was made last year by a performer who had been before the public for some 40 years—and sounded it. As an exponent of this and other serious works for the violin in the 1920s when better-known violinists were treating the public to large doses of sugary pap, Szigeti has earned a right to make such a recording. But virtuosity is almost as important to Beethoven as understanding; and here he is hopelessly outclassed by Jascha Heifetz' fine recording for RCA Victor. Or, if you're in the market for something a little less showy, try Zino Francescatti's thoughtful performance on Columbia. For us, the Szigeti is a rather poor third choice.

Handel

Julius Caesar: Highlights, *Joan Sutherland, Monica Sinclair, soloists with New Symphony Orch. Cond. Bonynge, London LOL 90087, \$7.95*

◆◆◆ Music
◆◆◆ Performance
◆◆◆ Recording

Not so many years ago, the idea of music as esoteric as this appearing on tape at all seemed ridiculous. Now we are treated not only to the music, but to a performance of it by one of the world's leading sopranos, all recorded according to today's highest standards. To top it all off, for those owners of automatic recorders which work on sonic beeps, there isn't even any need to reverse this reel manually—the beep tone is already there.

Actually Miss Sutherland tends occasionally to indulge herself in

some vocal flourishes which might have puzzled Handel, and some of her text is unclear. But for the most part this is beautifully sung, beautifully recorded.

Mahler

Symphony No. 5, In C Sharp Minor, Berg: Wozzeck (Excerpts), *Phyllis Curtin (soprano) and the Sacred Heart Boychoir (in the Berg). Boston Symphony Orchestra, Erich Leinsdorf, conductor, RCA Victor FTC 7007, \$14.95*

◆◆◆ Musical Interest
◆◆◆ Performance
◆◆◆ Recording

Erich Leinsdorf leads a powerful, beautifully controlled performance of this huge variegated work. His pacing is precisely right: wonderfully exciting in the tumultuous first movement; breathlessly tender in the lovely Adagietto. Rarely has the fine Boston Symphony string section sounded so superb. In fact, this is definitely one of the best Mahler releases in years.

In the Berg excerpts, Leinsdorf's skill as an operatic conductor, together with excellent singing by Phyllis Curtin, result in a performance that seems frustratingly brief.

Purcell

Dido and Aeneas, *Mary Thomas (soprano), Dido; Honor Sheppard (soprano), Belinda; Helen Watts (contralto), Sorceress; Robert Tear*

(tenor), *Spirit and Sailor; Maurice Bevan (baritone), Aeneas; Oriana Concert Choir and Orchestra, Alfred Deller, conductor, Vanguard VTC 1692. 54 minutes. \$7.95*

◆◆◆ Musical Interest
◆◆◆ Performance
◆◆◆ Recording

Henry Purcell was probably the greatest composer England ever produced. Everything he wrote contained a measure of inventiveness and maturity found in few of his contemporaries. This delightful opera, composed for a girls' school just 275 years ago, is the first major Purcell to appear in the tape catalogue. Moreover, the performance, as conducted by Baroque musicologist Alfred Deller, is rich in dramatic emphasis and adroit characterization. The principals are well chosen and the singing of the Oriana Concert Choir is beautifully defined. The recording is good without being spectacular, and stereo separation is not accentuated. The work is recorded as a concert performance, rather than with simulated movement. Highly recommended.

Sibelius

Symphonies No. 2N4, L'Orchestre de la Suisse Romande, cond. Ansermet, London, LCK 80152, \$14.95

◆◆◆ Musical Interest
◆◆◆ Performance
◆◆◆ Recording

One can never accuse Ansermet of

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Performance

Uninteresting

Of interest to a specialized audience only

Of general interest

Of particular interest

Recording

Low-fi, totally lacking in stereo effect

Mediocre, lackluster

Comparable with today's recording standards—good average recording

Outstanding, with intelligent use of stereo effect

Music

◆ Poor

◆◆ Routine

◆◆◆ Good overall

◆◆◆◆ Outstanding, superior

TAPE REVIEWS

limiting his repertoire. The octogenarian conductor, having given us superb performances of Stravinsky, Debussy, Ravel, Tchaikowsky, recently produced some masterly Beethoven and Haydn "Paris" symphonies. Now he turns to the specialized material of Sibelius.

The results, unfortunately, are far from successful. Where one might expect Ansermet's attention to orchestral color to reveal new facets in these scores, his conducting simply produces two overly cautious, uninteresting performances. There is no dash, no arctic fire, none of the excitement generated by Ormandy in the Columbia tape of the Second Symphony. It's all a grey monotone.

His orchestra, usually one of the best co-ordinated ensembles in Europe, plays listlessly. It's all such a pity, because this is the first Sibelius Fourth in the catalogue, and both works are blessed with superlative recording. Moreover, this is one of London's bargain twin-packs, a point that may still attract some buyers to this release.

A French Program

Artur Rubenstein, piano, includes Ravel's *Valses nobles et sentimentales* and *La vallee des cloches*; Poulenc's *Mouvements perpetuels* and *Intermezzo*; Chabrier and Faure, RCA Victor FTC 2188, \$7.95

◆◆◆ Musical Interest
◆◆ Performance
◆◆◆ Recording

Rubinstein's first all-French program contains superb playing and much persuasive charm. The selections are delightfully varied, and all are performed with a high degree of polish. There is gallantry and bravado in Ravel's Valses; quiet tenderness in the lovely Faure nocturne.

And yet, I do find the performances rather meticulous. I miss the flowing colors of Casadesu or Gieseking, who have recorded this music on disc. They add a mysterious impressionism, merging the myriad thoughts and emotions into subtle compositions, like stained glass windows in rain, with the rich colors running softly into each other.

The piano sound is excellent. All the nuances of this delicate music have been captured with great

clarity. In spite of my one misgiving, I do hope that Victor persuades this magnificent pianist to record more from the French repertoire. A tape like this is a beautiful way to round out your late-night listening.

Johann Strauss

Die Fledermaus, Eberhard Wachter, Eisenstein; Anneliese Rothenberger, Adele; Adele Leigh, Rosalinde; George London, Falke; Rise Stevens, Orlofsky; Sandor Konya, Alfred; Erich Kunz, Frank; Vienna State Opera Orchestra and Chorus, Oscar Danon, conductor, Victor FTC 7004 \$14.95



Anneliese Rothenberger

◆◆◆ Musical Interest
◆◆ Performance
◆◆◆ Recording

Victor's recording of this beloved operetta is quite different from Von Karajan's dashing performance. The dialogue has been cleverly cut and the score is the original version from the Library of Congress. The new tape also avoids a gala treatment of the Orlofsky Ball, which lengthened the London version and increased its cost.

Apart from that, the new production reveals only two stars: Danon and Rothenberger. Danon's warmth and wit with this score is second only to Clemens Kraus. And Anneliese Rothenberger is captivating as Adele, as gay and coquettish as a Viennese waltz.

The rest of the cast is not inspired. Adele Leigh, as Rosalinde, sings well but lacks the cool sophistication of Hilde Gueden on London. Wachter

has no subtlety and simply shouts throughout his role. George London sounds too heavy, failing to capture the right idiom for this music. As Orlofsky, Rise Stevens is not only weak vocally: her characterization is grotesque.

The stereo sound is rich, with excellent separation. The entire recording is staged with imagination and vocal/orchestral balances are splendid. Considering cost, and Danon's sympathetic contribution, this would be the version to own.

Mahler

Symphony No. 2, "The Resurrection," Jenny Tourel, Lee Venora, N. Y. Philharmonic, cond. Bernstein, Columbia M2Q 604, \$11.95

◆◆◆ Musical Interest
◆◆◆ Performance
◆◆◆ Recording

There are plenty of fine performances of this apocalyptic symphony on disc: Scherchen, Walter, and two recordings by Klemperer. Klemperer's second version, a rather stolid, unimaginative reading, is the only other tape performance available.

In every case, the recording is inadequate. There are passages in the tumultuous final movement that require an immense dynamic range. In fact, other than the Berlioz Requiem and the Mahler Eighth Symphony, this is one of the most difficult scores to record.

Which brings us to Bernstein. Now, at last, the Columbia engineers have produced a recording that sonically does justice to the musical ideas. It is magnificent. Every detail is clear, every crescendo bursts forth without tonal thickening or distortion. It is a triumphant example of modern recording techniques at their best.

Coupled to this superb sound is Bernstein's exalted reading. It is quite clear that Bernstein is the finest Mahler conductor in America. A worthy successor to the late Bruno Walter. This is a powerful, dramatic performance with all the blazing intensity of Scherchen, all the grandeur and lyricism of Walter, all the shimmering detail and discipline of Klemperer. Bernstein is joined in his stupendous achievement by Jennie Tourel and Lee Venora. Both sing with great inspiration, and the Collegiate Chorale is excellent.

Mahler was only 34 years old when he wrote this remarkable score. It is a score that Richard Strauss treasured all his life because it contained musical ideas years ahead of its time. Perhaps it won't appeal to everyone, but it should be heard. And I can think of no greater performance to reveal its many splendors than this new recording by Bernstein. Don't miss it.

Bizet

Carmen, Leontyne Price, Franco Corelli, Robert Merrill and soloists Vienna State Opera Chorus Vienna Philharmonic Orch. cond. Herbert von Karajan, RCA Victor FTC 8009, \$21.95

◆◆◆ Performance
◆◆◆ Recording
◆◆◆ Music

Here's RCA Victor's answer to the *Carmen* released several months ago by London. As far as sound quality, theatricality and dramatic use of stereo effect are concerned, RCA has won the battle hands down. But there are some blemishes here and there in the performance. RCA's Franco Corelli is not noticeably superior to London's Mario del Monaco in his phrasing and singing; whereas London's Regina Resnik is our hands-down favorite as a singing actress in the title role. Von Karajan's tempos become downright lethargic on occasion. Our verdict: good—but not great.

Tchaikovsky

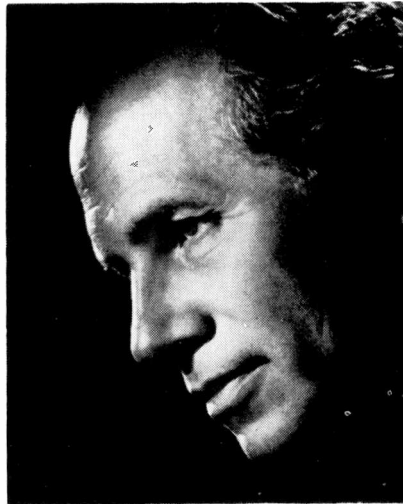
Overture 1812, Minneapolis Symphony Orchestra cond. Dorati (in the *Tchaikovsky*) University of Minnesota Brass Band

Beethoven

Wellington's Victory, London Symphony Orch. cond. Dorati (in the *Beethoven*), Mercury \$4.95

◆◆◆ Performance
◆◆◆ Recording
◆◆◆ Music

There's no other tape which even comes close to this one in its ability to deafen you with its cannon, muskets and carillon. The recordings are not new—dating back to 1960 and 1961. But they still rank supreme as demonstrators for fine stereo systems. Dorati's 1812 gets off to a peaceful



Antal Dorati

enough start—so keep your volume control in its normal position. The racket commences soon enough. *Wellington's Victory* is pretty lightweight Beethoven, but if you must have it, then this is the version to have.

Gershwin

Porgy and Bess: A Symphonic Picture, Minneapolis Symphony Orch. cond. Dorati (in the *Gershwin*)

Gould

Latin-American Symphonette, Eastman-Rochester Symphony Orch. cond. Hanson (in the *Gould*), Mercury SR 90394 \$7.95

◆◆◆ Performance
◆◆◆ Recording
◆◆◆ Music

"This album has been electronically created from the original monaural master tape" announces a tiny line at the top of the jacket. And so it has. Monaurally, both of these were fine high fidelity recordings when they were made back in the mid 1950s. Today their sound still is good, although there is nothing in the way of stereo effect. The Gould and Gershwin are two easily accessible pieces of American music which should convince just about anybody that "serious" music is worth listening to.

Tchaikovsky

Capriccio Italien, The London Festival Orch. cond. Black, London LCL 75004, \$7.95

Rimsky-Korsakov

Capriccio Espagnol, The London Festival Orch. cond. Black, London

◆◆◆ Music
◆◆◆ Performance
◆◆◆ Recording

Victor and Epic have recorded essentially the same program, with better performance but sound which isn't nearly as striking as this. London's Phase 4 treatment of these two warhorses more than makes up for performances which are outclassed by Dorati, Szell and Kondrashin (in the Tchaikovsky) and Kondrashin, Szell and Bernstein (in the Rimsky-Korsakov). Epic's Szell generously throws in two other standards—Borodin's *Polovtsian Dances* from "Prince Igor" and Moussorgsky's "Dawn on the Moskva River" for the same price. But for sheer sonic pleasure, London has no competition at all.

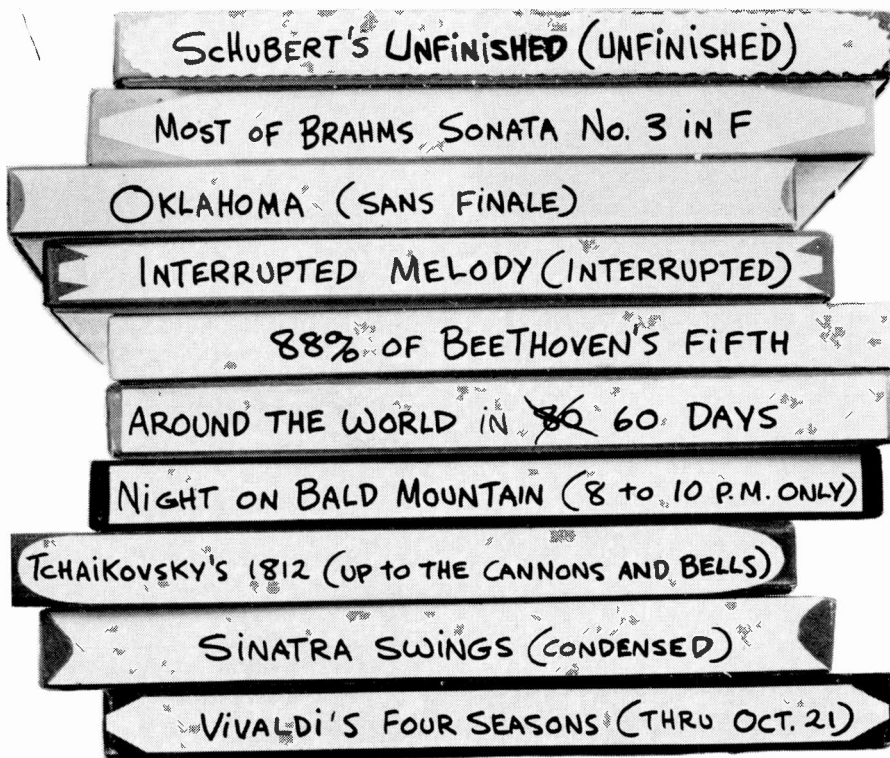
Tchaikovsky

The Nutcracker Suite, Philadelphia Orch. cond. Ormandy, Columbia MQ 689, \$7.95

◆◆◆ Music
◆◆◆ Performance
◆◆◆ Recording

Here's a healthy portion of "Nutcracker" in a sympathetic reading by Eugene Ormandy. The competition includes no less than five recordings of the complete score (at \$11.95 each), the best of them by Artur Rodzinski and the London Philharmonic on Westminster; and three 25-minute sets of excerpts. Essentially the same program as Ormandy's has been recorded by Fritz Reiner and Ernest Andermet. Of these three, the Ormandy, in our opinion, is the best of the lot with the Philadelphia Orchestra's lush strings singing out at every opportunity. The real question is how much "Nutcracker" you want. If 25 minutes is enough, we'd suggest Bernstein's recording, also for Columbia. But if you'd like a little more, this is your best bet. Recording is typical of the high standard Columbia has set in its previous Philadelphia Orchestra tapes.

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TAPE REVIEWS

None But the Lonely Heart,

Isaac Stern, violin, Columbia Symphony Orch. cond. Katims, Includes: Greensleeves, Ava Maria, Clair de Lune, Humoresque, Liebeslied, Hungarian Dance No. 5, Jamaican Rumba, etc., Columbia MQ 688, \$7.95

◆◆◆ Music
◆◆◆ Performance
◆◆◆ Recording

The last violinist we remember offering this kind of program was the late Fritz Kreisler, who is represented on this tape by his "Liebesleid." Here are pyrotechnics smothered in syrup—the sugary favorites from the classical and modern repertoires served up with Stern's accustomed fire. True, Aaron Copland's "Hoedown" does help to take the edge off things, but there's still all that Brahms, Tchaikovsky and Stephen Foster to wade through. The orchestra provides a lively and sympathetic background; and recorded sound is excellent, with perhaps a slight shrillness in some of the highs.

Shakespeare

Hamlet, Richard Burton, Hume Cronyn, Alfred Drake and Original Broadway Cast, Columbia DCQ 665, \$11.95

◆◆◆ Performance
◆◆◆ Recording
◆◆◆ Interest

This taped version of Richard Burton's *Hamlet* has one distinct advantage over the live production—the listener isn't distracted by actors wandering about the stage in modern dress. But he may find the recording a bit dry and uninteresting (stereo is rarely used here to create a theatrical effect) and he may prefer the more dramatically satisfying performance by the Marlowe Society on London S 86005. But if you want a souvenir of Richard Burton, here it is, all on a single reel of tape (recorded at 3¾ ips).

Sidney Michaels

Dylan, Alec Guinness, Kate Reid Original Broadway Cast, Columbia DCQ 666, \$11.95

◆◆◆ Performance
◆◆◆ Recording
◆◆◆ Interest

This is one of those tapes which will be played and replayed by students of the drama and lovers of

great theatre. It features the virtuoso performance of Alec Guinness as the poet Dylan Thomas and the sensitive portrayal of Kate Reid as his wife. Stereo effects abound here, virtually always adding to the sense of theatre. Recording is made at 3¾ ips, providing substantial tape economy and eliminating no less than four breaks found in the disc version.

Gil Evans

The Individualism of Gil Evans, *Verve VSTC 319*, \$7.95

- ◆◆◆ Music
- ◆◆◆ Performance
- ◆◆◆ Recording

This is the first album in three years by jazz composer, arranger, conductor and pianist Gil Evans. While his work is out of the ordinary, it is far from dull. It is intricate, highly stylized and highly intellectual. It offers a new direction and creates new opportunities for jazz musicians. Evans may prove difficult for some listeners at first, but his music is exciting.

Evans was at one time chief arranger for the Claude Thornhill orchestra and one of the first to use French horns in jazz. He uses flutes, oboes and English horns (the standard classical woodwinds) along with French horns and a few conventional jazz instruments to extend the scope of the jazz orchestra. Some of the sounds he creates may seem at first listening weird and unearthly, but they are intriguing and draw the careful listener back. Each listening enhances the magical Evans effect. This tape is well worth adding to your collection. The stereo effect, by the way, is subtle but superb.

The Incomparable Mantovani

Mantovani and his Orchestra, *London LPM 70088*, 35 minutes, \$6.95

- ◆◆◆ Music
- ◆◆◆ Performance
- ◆◆◆ Recording

Lovers of Mantovani and the lustrous sounds he creates will be pleased with this tape. Included are many old favorites: *Fly Me to the Moon*, *September in the Rain*, *I'll Be Seeing You*, *As Time Goes By*, and *Yesterdays*. And all are played in the rich, sweeping style that has been captivating millions for more than seventeen years. The recording has depth rather than width. It is warm and glowing, creating an ideal

mood for relaxed, late-night listening. Altogether, a most enjoyable release.

Al Hirt

"Pops" Goes The Trumpet, (*Holiday for Brass*) *Al Hirt & The Boston Pops with Arthur Fielder*, *RCA FTC-2171*, \$7.95



- ◆◆◆ Music
- ◆◆◆ Performance
- ◆◆◆ Recording

From the opening bullfight classic "La Virgen de la Macarena" Al Hirt is in command. This is a tour de force by a master ably backed by the Boston Pops. The traditional Hebrew melody Eili, Eili is done beautifully. His Carnival of Venice, Trumpeter's Lullaby, Toy Trumpet, Bugler's Holiday and Trumpet Concerto show Hirt at the top of his form. In fact, the only let down comes at the close of the album when Hirt plays his great hit, Java. The Boston Pops just doesn't swing enough to balance Hirt's great trumpet. But that's our only complaint. This is a fine listening tape.

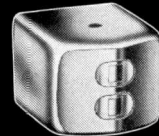
Jimmy Smith

The Cat, *Jimmy Smith*, *Verve VSTC 322*, \$7.95

- ◆◆◆ Music
- ◆◆◆ Performance
- ◆◆◆ Recording

In case you're not familiar with the swinging jazz organ of Jimmy Smith, this tape should serve as an excellent introduction. With tremendous energy and feeling, Smith puts his organ through its paces and is clearly the victor. He is heavily back-

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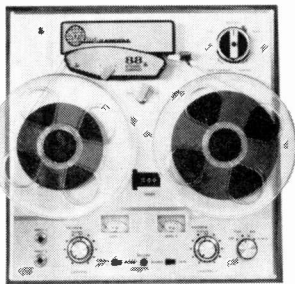
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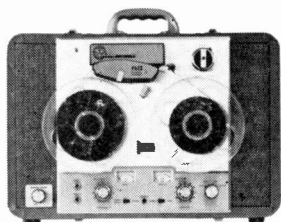


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TAPE REVIEWS

(Continued from page 49)

ed with brass including six trumpets, four French horns and four trombones (one manned by Urbie Green) and a tuba. In addition to bass, percussion and drums, he has Kenny Burrell on guitar. This session was arranged and conducted by Lal Schiffrin who has concentrated his efforts on showcasing the talent of Smith and his driving, moving organ.

Beatle Songs

Big Band Beatle Songs, Arranged and directed by Bob Leaper, LRL 74056, \$7.95

◆◆◆ Music
◆◆◆ Performance
◆◆◆ Recording

What has sustained the Beatles beyond the faddist stage is their material. The hit songs written for the group by John Lennon and Paul McCartney have easily remembered melodies and strong flexible chord progressions which lend themselves to a wide variety of rhythms and interpretations. To this reviewer Bob Leaper's big (19 men) brass dominated band gets in the way too often. I like the opening "Love Me Do" followed by "Please Me" on side one. The stereo separation throughout is excellent. However, except for some fine individual performances on side two, this big, driving band left me cold. So far, I prefer Arthur Fiedler's approach to Beatle orchestration.

Football Songs

Kick Off, U.S.A., University of Michigan Band, includes Maine Stein Song, Down Down the Field, Eyes of Texas, Fight Tiger, Navy Blue and Gold, Nittany Lion, Roll On Tulane and 15 others, Vanguard VTC 1691, \$7.95

◆◆◆ Performance
◆◆◆ Recording
◆◆◆ Music

This tape arrived a bit late for the collegiate football season — and, frankly, it's difficult to work up enthusiasm for it in the middle of basketball season. Suffice it to say that there are gridiron marches from 20 colleges across the country (plus 76 Trombones and the National Anthem) played as you might hear them any Saturday afternoon in an

Ivy League college bowl, but recorded in stereo with all the skill of Vanguard's engineers. A bit much for repeated or prolonged listening, however.

Johnny Mathis

The Wonderful World of Make Believe, Johnny Mathis, includes Camelot, La Mer, Shangri-La, House of Flowers, Alice in Wonderland, I'm Always Chasing Rainbows, Sands of Time, Beyond the Blue Horizon and others, Mercury STC 60913, \$7.95

◆◆◆ Music
◆◆◆ Performance
◆◆◆ Recording

Here are a number of slightly off-the-beaten-track tunes done in the Johnny Mathis style, which accounts for the fact that the album has already scored on the best-seller charts. Sound is adequate.

Sam Cooke

Sam Cooke at the Copa, RCA Victor FTP 1290, \$7.95



◆◆◆ Music
◆◆◆ Performance
◆◆◆ Recording

I came to this album with a "show me" attitude. Young Mr. Cooke showed me—but good. This was a dynamic, versatile young performer with a high degree of showmanship. It's obvious throughout that he had plenty of personal charm and had this Copa audience with him all the way.

Cooke is best on upbeat material and distinguishes himself with "Bill Bailey," "If I Had a Hammer," and the "Tennessee Waltz." On some of his numbers he begets almost a re-

ligious fervor which adds to his infectious quality. The album includes Cooke's first big hit, "You Send Me." He will. He was an artist.

Connie Francis

A New Kind of Connie, *Connie Francis, MGM STC 4253, \$7.95*



◆◆◆ Music
◆◆◆ Performance
◆◆◆ Recording

In some ways this is indeed a new kind of Connie. In fact, on "I've Got a Crush on New York Town," she exhibits a quality which reminded this reviewer of Eydie Gorme. This number is easily the best thing in the album and almost worth the price of it alone. It is destined to be a classic.

On side two Connie opens with a very fast and very good "Will You Still Be Mine" and follows with a beautifully paced rendition of "My Man" sounding very much like the old Connie Francis. She then lifts the pace with "More" and follows with a smashing version of "The Sweetest Sounds," the best number on this side. This is a tape any Connie Francis fan will enjoy—and one which may win her many new converts.

Caterina Valente

Valente & Violins, *London LPM 70089, \$7.95*

◆◆◆ Music
◆◆◆ Performance
◆◆◆ Recording

Caterina Valente is certainly a

distinguished performer. She is at home with a wide range of material and shows it in this album. She comes across very well in two numbers arranged in a Bossa Nova rhythm. However, Miss Valente sounds as if she's straining on a couple of numbers.

The addition of the violins as mentioned in the title doesn't seem very significant in the overall performance, which is good but not as lyrical as the liner notes would have us believe.

Osmond Brothers

All-Time Hymn Favorites, *The Osmond Brothers, includes In The Garden, My Task, Whispering Hope, Abide With Me, I Need Thee Every Hour, Now The Day Is Over, Oh My Father and others, MGM STC 4235, \$7.95*

◆◆◆ Performance
◆◆◆ Recording
◆◆◆ Music

Here are a dozen favorite old-time hymns sung tastefully by four personable boys who have developed their own following from TV appearances on the Andy Williams Show and the *Travels of Jamie McPheeters*. What this tape lacks in big-city sophistication it makes up in honest heartfelt sentiment. If you're looking for really good recordings of these sacred standards, you can't do better than this tape.

Knuckles O'Toole

Knuckles O'Toole Plays Again, *includes: The Band Played On; I'm Looking Over a 4-Leaf Clover; I Want a Girl; Kitten on the Keys; Beer Barrel Polka; Bye Bye Blackbird; etc. ABC-Paramount ATC 843, \$7.95*

◆◆◆ Music
◆◆◆ Performance
◆◆◆ Recording

What the box doesn't tell you is that there's a Mitch Miller chorus mixed in with this honky-tonk piano. Either one by itself would have made a first-rate tape, but the combination doesn't seem to us to be a good idea. The chorus doesn't appear in every number, which gives you some opportunity to hear one of the best ragtime pianists in the business at his very best. The piano is recorded

close-to, with plenty of presence. The songs are all old favorites. This isn't everybody's cup of tea, but if you don't mind a little sing-along with your ragtime, you may want to give it a try.

My Fair Lady

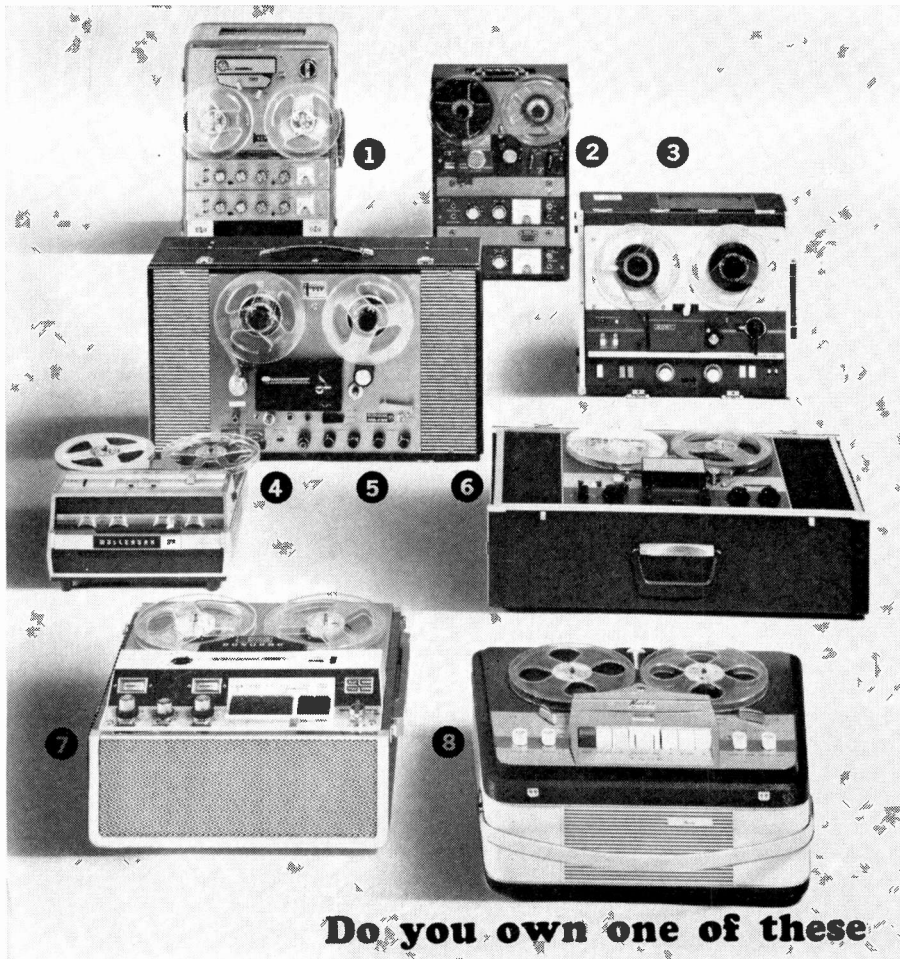
My Fair Lady, Original Sound Track Recording with Rex Harrison, Stanley Holloway, Columbia OQ 664, \$8.95



◆◆◆ Music
◆◆◆ Performance
◆◆◆ Recording

"My Fair Lady" is still the smash hit it was when it opened in New York on March 15, 1956. Here are all the familiar songs, beautifully recorded, to provide a worthwhile souvenir for the millions of Americans who are seeing the show for the first time on the screen. If you already have the original Broadway cast tape, however, you'll find little need for this one. Rex Harrison's performance on the screen isn't quite as crisp, and Audrey Hepburn's vocal stand-in on this tape is no match for the original cast's Julie Andrews.

Listed on the next page are each of the tapes reviewed in this issue of TAPE RECORDING. Use the coupon at the bottom of page 52 as a handy shopping list to take with you the next time you visit your tape dealer. Simply check off below those tapes which interest you, or those which you must have for your library.



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TAPES TO BUY

- The Wonderful World of Make Believe, Johnny Mathis, Mercury STC 60913, \$7.95
- My Fair Lady, Columbia OQ 664, \$8.95
- "Pops" Goes the Trumpet, Al Hirt & Boston Pops, RCA FTC-2171, \$7.95
- The Cat, Jimmy Smith, Verve VSTC 322, \$7.95
- Sam Cooke at the Copa, RCA Victor FTP 1290, \$7.95
- KickOff, U.S.A., Univ. of Mich. Band, Vanguard VTC 1691, \$7.95
- All-Time Hymn Favorites, Osmond Bros., MGM STC 4235, \$7.95
- Knuckles O'Toole Plays Again, ABC Paramount ATC 843, \$7.95
- Valente & Violins, London LPM 70089, \$7.95
- A New Kind of Connie, Connie Francis, MGM STC 4235, \$7.95
- Big Band Beatle Songs, London LRL 74056, \$7.95
- The Individualism of Gil Evans, Verve VSTC 319, \$7.95
- Beethoven Concerto in D for Violin, Szigeti, Mercury STC 90358, \$7.95
- Bizet, Carmen, RCA Victor FTC 8009, \$21.95
- Tchaikovsky Overture 1812; Beethoven-Wellington's Victory, Mercury, \$4.95
- Purcell-Dido and Aeneas, Vanguard VTC 1692, \$7.95
- Handel—Julius Caesar, Highlights, London LOL 90087, \$7.95
- Mahler—Symphony No. 5, in C Sharp Minor, Berg: Wozzeck (Excerpts), RCA Victor FTC 7007, \$14.95
- Beethoven—Fidelio, London, LGS 90085, \$21.95
- Gershwin—Porgy and Bess; Gould—Latin-American Synphonette, Mercury SR-90394, \$7.95
- Shakespeare—Hamlet, Columbia DCQ 665, \$11.95
- Sidney Michaels—Dylan, Columbia DCQ 666, \$11.95
- Johann Strauss—Die Fledermaus, RCA Victor FTC 7004, \$14.95
- A French Program, Artur Rubenstein, RCA Victor FCT 2188, \$7.95
- Tchaikovsky—Capriccio Italien, London LCL 75004, \$7.95
- Rimsky-Korsakov — Capriccio Espagnol, London LCL 75004, \$7.95
- Tchaikovsky—The Nutcracker Suite, Columbia MQ 689, \$7.95
- The Incomparable Mantovani—Mantovani and his Orchestra, London LPM 70088, \$6.95
- None But the Lonely Heart, Issac Stern, Columbia MQ 688, \$7.95
- Sibelius—Symphonies 2N4, London LCK 80152, \$14.95
- Mahler—Symphony No. 2, Columbia M2Q 604, \$11.95

Or if you prefer, just tear out this column and mail it to your dealer with your check or money order for the total amount of the tapes you've checked off. Be sure to fill in the following information.

Name

Address

City Zip Code State

tape

CLASSIFIED

Rates: Commercial ads: 30¢ per word. Minimum order \$5.00. Swaps: 15¢ per word. Minimum \$2.50. Copy must be accompanied by remittance in full.

Business Opportunities

Put your tape machine to work. Beginning and experienced recordists needed to tape special events, by assignment, in your area. Good money maker. For details write JBB Enterprises, Box 331, Granada Hills, California.

Educational Opportunities

"TAPE RECORDING For Pleasure & Profit" This tremendous volume a foot square, an inch thick is jam-packed with hundreds of money-making ideas using a Tape Recorder! Make Radio Commercials, Sound-On-Sound, Unusual Effects, Weddings, Industry, Business, Master Tapes, etc. An unlimited storehouse of uses! Unconditionally guaranteed! Not a book. A complete Home Study Course! Supply Limited. \$4.95 each, plus .30 postage. No C.O.D. Order Today! Hammer Enterprises, Asheboro, N. C.

For Sale

Like New Ampex 351 portable with cases. 3¾—7½ ips. Two channel Stereo. \$1500.00. Walter George Bergman, P.O. Box 214, Wellesley Hills, Mass. 02181 617-235-3700.

NEW! Tape automatic shutoff \$3.95. Reel adaptors: 10½" for regular, 7" for battery portables. Leeroi Electronics, Marengo, Illinois 60152.

What am I offered for 1962 Ampex Model 960? Four-track, two speed, normal amount of use but well cared

for. Shipped to highest bidder C.O.D. from New York City. Box 113, Tape Recording, 156 East 52nd Street, New York, New York 10022.

Luxor MP 423 for sale. Swedish-made three-speed four-track stereo recorder, used but in good condition. Complete with microphone and service manual. Your quote should include shipping from Danville, Pa. Box 119, Tape Recording, 156 East 52nd Street, New York, New York 10022.

What am I offered for used Norelco E1 3516 3-speed two-track mono recorder in top working condition? Also have used Magnemite 610 SD battery-operated tape recorder (7½ ips, mono, two-track) ideal for broadcast use, professional or scholastic field recordings. Highest offer C.O.D. from Brooklyn, N. Y. takes each recorder. Box 121, Tape Recording, 156 East 52nd St., New York, New York 10022.

Rentals

STEREO TAPE Rentals for the discriminating listener. Gold Coast Tape Library, Box 2262, Palm Village, Hialeah, Fla. 33012.

RENT 4-TRACK STEREO TAPES—All labels and titles—Prompt service and dependability our keynote—No deposit—Postpaid both ways (48 States)—Free BROCHURE and CATALOG—TRIMOR Company, Dept. MTD, P.O. Box #748, Flushing, N. Y. 11352.

Swaps

Interested in opera recorded off the air—particularly Metropolitan Opera broadcasts recorded in 1940s and

early 1950s, opera broadcast in Britain, Germany, Italy, etc. Willing to swap dubbings of rare 78 rpm opera vocals, etc. Prefer quarter-track mono or stereo recordings @ 3¾ ips for this type of material. Recorder: Roberts 997. Hamilton Carson, Box 111, Tape Recording, 156 East 52nd St., New York, N. Y. 10022.

Interested in comedy—off-the-air from 1940s by Fred Allen, W. C. Fields, Ed Wynn, Henry Morgan, Bob & Ray, etc.; film sound tracks like Arsenic & Old Lace, Never Give a Sucker an Even Break, etc.; Canadian or British comedy by Rawhide, Goons, Tommy Handley, Ted Ray, Steptoe & Son, etc. Have number tapes of similar material to swap. Prefer 3¾ ips quarter-track mono. Recorder: Norelco 401. George Robertson, Box 120, Tape Recording, 156 East 52nd St., New York, N. Y. 10022.

Tapes

USED MYLAR TAPES—1800 foot—7 inch reels. Minimum order 10 tapes for \$10.00. 20 tapes for \$19.00. 50 tapes for \$45.00. Postage prepaid in U. S. Send check with order. B. Freeman, 800 W. 87th St., Kansas City, Missouri. 64111.

SATIRE: John Paul Jones educational and philosophical tapes featuring integrated sound effects. Stereophonic sampler, \$1.25. Free catalog. Write SOUNTAGE RECORDING COMPANY, Box 176, Levittown, New York 11756.

Miscellaneous

BIG BANDS, air checks, collectors items. Box 322, Glen Head, New York.



WITH

EDITALL® Tape Splicers

(invented by Joel Tall, Pioneer Tape Editor)

- Patented curved groove holds tape snugly without clips for fastest, safest splicing!
- Tape edges stay ungouged—just like new!
- Spliced tape can be used thousands of times—splices won't separate—ever!
- Shattered bits of tape splice together quickly, perfectly!
- Precision made—stays accurate for more than 1 million splices!
- Used by professional broadcast tape editors all over the world!

S-2, 4 in. long, adhesive mtg.....	\$6.50
KS-2, includes S-2 plus accessories.....	\$7.45
S-3, 5 3/4" long, mtg. holes.....	\$8.00
KS-3, includes S-3 plus accessories.....	\$8.95
(complete with instructions)	

At your dealer or send check or M. O. (delivery postpaid) to:

THE TALL COMPANY 158 South Terrace Ave.,
Mt. Vernon, N. Y. 10550

Dealer Inquiries Invited.

Circle 23 on Reader's Service Card



Erases an entire reel
in seconds!

NEW

ROBINS LOW-COST BULK TAPE ERASER model ME-77

At last! A professional quality bulk eraser for the amateur recordist. The ME-77 completely removes recorded and unwanted signals from reels of tape up to 3/4" wide and 7" in diameter. Seconds after you switch it on—you have a fresh—sound-free and noise-free tape ready for recording. And since the ME-77 reduces background noise 2 to 4 db below normal erase head levels, future recordings will be as clear as the original. Easy to use, the compact ME-77 comes in a durable bakelite housing.

At dealers or write:

ROBINS INDUSTRIES CORP.
FLUSHING, N. Y., 11356

Circle 20 on Reader's Service Card

tape

CLUB NEWS

A plea for help in sending a spoken message from a gravely ill patient in England to his mother in Poland travelled from Amptill, Bedford, to Cheshire (England), thence to Dallas, Texas, U.S.A., over to Munich, Germany, and then by radio to Poland with the help of World Tapes for Education members in these many places.

Alojzy Matysek, bedfast and almost unable to talk from disseminated sclerosis, hoped to receive a taped message from his mother in Gornly Slask, Poland, in answer to his tape.

Bill Leggett, a member of the Toc. H. Hospital Social Services, set the wheels in motion for this unusual message when he asked members of the Bedford Tape Recording Club to help Alojzy tape the message. The local club sent an urgent letter to WTE Representative for the United Kingdom, John Davies of Sale, Cheshire.

An airletter from Davies to WTE Headquarters in Dallas was relayed to Alex Menhard, a WTE member who is in charge of radio programs beamed to Poland from the Radio Free Europe station in Munich, Germany. Alex immediately contacted the hospital in England, but the tape he received did not contain Alojzy's voice, only that of another person relaying his message.

Alex, who had already planned a short trip to London, left immediately with his portable recorder and soon arrived in Bedford, England. He recorded Alojzy's whispering voice in this message to his mother:

"My dear mother, this is your son Alojzy speaking. I send you warm greetings. I am in a hospital near Bedford. Perhaps it can be done, and I shall receive greetings from you on tape. This would make me very happy. Please do not worry about me. I wish you all the best. I wish

you a happy Christmas."

This message has been broadcast a number of times over Radio Free Europe, with an appeal to tape recorder enthusiasts in the town of Bytom, Poland to tape a reply. "Up till now, there was no reply from Poland," reports Alex Menhard, "but we hope it still will come, in spite of the official ban on sending tapes out of the country."

World Tapes for Education was recently ruled a non-profit corporation to which donations are deductible for Federal income tax purposes.

Many new volunteers have been received for the WTE Services for the Blind, directed by Bob Brunson, Oklahoma City educator. Following an appeal in TAPE TOPICS, the bi-monthly magazine which goes to all WTE members, several people have offered to do this valuable reading service for blind students and professional people.

The WTE Library, directed by Edward E. Cumbie, Homestead, Fla., offers more than 500 programs to members on a dubbing basis. The library now is facing the problem of securing tape and dubbing facilities so that each of the six branch libraries in other countries can be provided with a copy of each program.

For information about the activities of the International Tape and Cine Society and its magazine "Tape and Cine Reel," contact:

Roger Pirie, Secretary
83 Warrens Hall Road
Dudley,
Worcester, England

For news of the FRIENDLY TAPE NETWORK, contact Fred Reynolds, 544 Clarkson Street, Colo.

(Continued from page 30)

paragraph of this article and read the first sentence, with the microphone directly in front of you, at a distance of one foot, the second sentence with the microphone at two feet and the third at three feet. Leave as little empty tape as possible, between the sentences. Be certain the recorded level is the same with all three sentences; this means that the record level control will have to be advanced each time the distance is increased.

Play this test strip back and notice the difference in the character of each individual recording as compared with the others. The differences will be quite startling to anyone who has never made a comparison of this nature. You will notice that as the distance between the microphone and the narrator is increased the sound becomes more "alive," reverberant and fuller. The difference in the quality and timbre of your voice at the various distances is quite noticeable. Choose the distance and mark the setting of the record level control at which your voice is most pleasing.

The character of your voice may be further altered by utilizing another of the techniques employed in recording studios to obtain a more flattering recording. Any microphone becomes less responsive to the higher voice frequencies as the speaker moves off the axis of the microphone. Since it is these higher frequencies which are primarily responsible for the harshness and excessive sibilance found in so many voices, it is obvious that any reduction in the amount of high frequency pickup will also reduce the amount of harshness and sibilance recorded. Our second test recording will show this. For this test use the distance and recording level determined previously. Stand directly in front of the microphone and read the first sentence. For the second sentence stand at an angle of 30-35 degrees off the axis of the microphone. For the third, use a 50-55 degree angle. For the fourth sentence a 75 degree angle should be employed.

When you play this recording back you will find the difference in the high frequency content of each sentence is quite noticeable. If your voice has any tendency towards harshness or sibilance you will also notice how they disappear as the angle off axis is increased. Choose the angle at which your voice is again most pleasing. We might suggest you compare this last recording with one of your earlier ones, you will be quite pleased.

Local radio commentators around the country are conducting personal interviews with celebrities they've never even met. It's all done with magnetic tape. The interviews are recorded in Hollywood or New York with appropriate blank spots into which local announcers insert their own questions from a script provided with the tapes. This gives station listeners the feeling that their local broadcasters are acquainted with leaders in entertainment, the arts, politics and other fields from every corner of the globe.

Have you ever wondered how you stack up against the average tape user? According to a 1962 survey by Bennett-Chaikin, Inc., he's male, 25 to 45 years of age, a college graduate earning anywhere from \$7000 to \$15,000 per year; he's either in the professions or is a business manager or proprietor; has 12.3 reels of tape at home, 9.7 of which are recorded, and has owned a recorder for at least three years. Three out of four are married, one in ten uses tape to practice musical instruments, 14 per cent to rehearse speeches or sales talks. Surprisingly, only 30 per cent have tape recorders primarily as a means of supplying musical entertainment.

Pre-recorded 4 Track Stereo Tapes at Discount

Through Our Special Membership Plan Citadel Membership — Proven by thousands of satisfied club members because . . .

- **YOU DECIDE ON YOUR PURCHASES** — Buy as few or as many tapes as you want . . .
- **FREEDOM OF SELECTION** — Virtually any tape, on any label, by any artist is available.
- **FREE! COMPLETE TAPE CATALOG** — With membership you receive this current catalog of all 4-track stereo tapes.
- **PROMPT SERVICE** — Many orders are shipped the day received . . . rarely later than the next several days.
- **100% GUARANTEE** — All tapes are guaranteed factory fresh and free of defects.

(Special! All LP records also available under your Citadel Tape membership.) Membership dues is \$4.00 a year . . . a nominal amount when you consider that as a CITADEL MEMBER BUYING TAPES AT DISCOUNT PRICES, YOUR DUES WILL BE PAID FOR WITH VIRTUALLY THE FIRST PURCHASE YOU MAKE THROUGH THE CLUB. Additional savings mount up, permitting you to buy more tapes on your tape budget.

Try membership for 30 days. If not completely satisfied, your dues will be refunded immediately. Complete the coupon below, include your \$4.00 yearly dues and upon receipt we shall forward all membership material to you.

CITADEL TAPE CLUB

division Citadel Record Club ST-5
545 Fifth Avenue, New York, N.Y. 10017

Name _____
Street _____
City _____ Zone _____ State _____

Circle 4 on Reader's Service Card

Pictures on Tape

Here are the leading contenders in the home videotape sweepstakes, together with their vital statistics and technical information which has been made avail-

	<i>Cinerama-Telcan</i>	<i>Fairchild</i>	<i>Norelco</i>	<i>Loewe-Opta</i>
Price	\$160 or so	\$3000 for console or portable model	\$3000 for industrial model	\$2500
Availability	Telcan has declared bankruptcy	Promised for next month	Expected early this year	early this year
Recorder size	same as conventional tape deck	same as conventional tape deck	about the same as conventional tape deck	slightly larger than conventional deck
Tape	quarter-inch triple-play tape on 11 $\frac{1}{4}$ " reel	$\frac{1}{4}$ " triple-play tape on 11" reel	believed to use 1" videotape on 8" reel	1" videotape on 8" reel
Tape cost per reel	\$30	\$25	No estimate	\$25 estimated
Tape Recording Time	22 minutes uninterrupted, 44 minutes per reel	15 minutes uninterrupted, 120 minutes per reel @ 120 ips	unstated	1 hour
Tape speeds	120 ips	120, 60 ips	6 ips	6 ips
Number of tracks	2	8	unstated	1
Reverse	no	yes		no
Head life	100 hours	1500 hours		unstated
Head replacement cost	\$2	\$15		unstated
Heads	2-erase record/playback	2—record and playback. All tape must be bulk erased		2—erase and slant track record/playback
Type of electronics	transistorized	transistorized		transistorized
Type of motor	ordinary induction	ordinary induction		hysteresis synchronous
Connections to TV	audio, video & horizontal synch. Can be done by qualified TV serviceman for about \$15	audio, video & horizontal synch. Can be done by qualified TV serviceman		audio, video & horizontal synch. Can be done by qualified TV serviceman
Picture quality	unsatisfactory for prolonged viewing, comparable to early TV kinescopes. Vertical hold wasn't always reliable	Highly satisfactory compared to TV original. Picture shows slightly less contrast than original at 120 ips. No problem with vertical or horizontal hold	reported to be of very high quality	nearly as good as Fairchild, and quite satisfactory for prolonged viewing despite some darkness at picture edges
Sound quality	adequate — comparable to \$59 recorder quality	adequate, comparable to good table FM radio sound	reported to be good	comparable to FM table radio sound and equal to Fairchild sound
Video camera	\$160 extra	included in \$3000 price	\$500	included in price

able thus far about each. Information has been compiled from data supplied by the manufacturers and from a number of trade sources.

<i>Par Ltd.</i>	<i>Ampex Signature V</i>	<i>Sony Videocorder</i>
\$250 estimated	\$30,000	\$600+
still in experimental stage	on sale now	expected late this year
same as conventional deck	slightly larger than conventional deck	slightly larger than conventional deck
1/4" triple play tape on 7" reel	1" videotape on 8" reel	1" videotape
\$11.95		\$20 for 1 hour
24 min. uninterrupted 48 min. per reel @ 30 ips		60 minutes
60, 30 ips		7 1/2 ips
2		
yes		
unstated		
unstated		
transistorized		
four-pole shaded		
audio, video & horizontal synch can be done by qualified TV serviceman	comes complete with TV set	
only marginally better than Telcan at 60 ips, with a good deal of show and loss of picture clarity	well-nigh indistinguishable from TV original	unavailable at press time
nonexistent now, although Par hopes to have wide range stereo sound	equals TV reproducer's sound quality	stereo. Fidelity will be dependent on retail price
\$500 estimated	included in \$30,000 price	Yes, but price not set yet

RE Tandberg
MEETS A GREAT ARTIST



RICHARD TUCKER

acclaims the "Better, Clearer, More Natural Sound" of

RE Tandberg **MODEL 74B** 3 SPEED/4 TRACK STEREO MUSIC SYSTEM

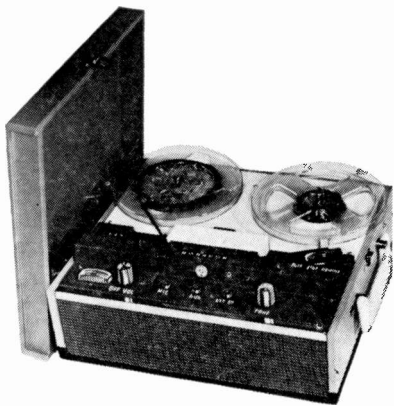
Mr. Tucker's choice of a tape recorder was based on the most exacting criteria . . . uncompromised sound clarity, unrivaled performance, unequalled dependability. Tandberg met and surpassed these standards, adding to them; compact size, ease of use, and overall fine quality. Listen to this Tandberg yourself. Compare the unparalleled record/playback frequency response — the lack of wow and flutter, the low tape tension. You'll agree that the Model 74B is perfect for you. Other features include — FM Multiplex filter, built-in speakers & amplifiers, 2 built-in cathode follower outputs, precision heads, "free" tape thread. At franchised dealers everywhere . . . \$449.50 (incl. carrying case).



ONE
YEAR
GUARANTEE

RE Tandberg OF AMERICA, INC.,
P.O. Box 171, 8 Third Avenue, Pelham, N. Y.
Circle 24 on Reader's Service Card

with this
solid state
AC operated
Monarch
tape recorder
you can



Model RT-300

- . . . listen to music
- . . . record from radio, TV or records
- . . . practice sales talks or speeches
- . . . have fun at parties
- . . . practice music
- . . . record family events
- . . . tape business meetings
- . . . improve your speech
- . . . add sound to home movies
- . . . learn a language
- . . . preserve your children's voices
- . . . dictate letters

and . . . (the best part)
it's only \$79.50

MONARCH ELECTRONICS
7035 Laurel Canyon Blvd.
North Hollywood, California 90601

TAPE EQUIPMENT

(Continued from page 36)

It is interlocked in this way to prevent tape spillage or damage.

Each channel's recording and playback volume is independently controlled and in conjunction with the separate VU meters is a great aid in balancing channels during stereophonic recording and playback and in maintaining uniform levels from tape to tape, whether stereophonic or monophonic.

The independent tone controls for each channel operate only during playback operation. The Hi-Fi position provides essentially flat playback response for playback through high fidelity equipment and is effective on signals from the pre-amp and external speaker outputs. During recording it is inoperative and has no effect.

The Wollensak 1280 has automatic high frequency erasure which removes previously recorded sound immediately before a new signal is recorded on the tape. The Wollensak 1280 provides all of the desirable features one expects to find in a quality recorder in this price class. The one notable omission was lack of a carrying handle.

The John F. Kennedy Memorial Library has asked some 40 world leaders to tape their impressions of President Kennedy for posterity. Among the first to accept were Harold Wilson of Great Britain and Paul Henri Spaak of Belgium. Among those invited to take part was Nikita Khrushchev, who may enjoy the ground rules. The leaders were told they could hold their tapes for release after their death or at any future date they might specify.

Dick Tracy may have his wrist radio, but the police in Philadelphia have their own battery-operated tape recorders for use in interviewing witnesses, interrogating suspects and making reports. The development of lightweight, reliable portables has facilitated field use of such equipment.

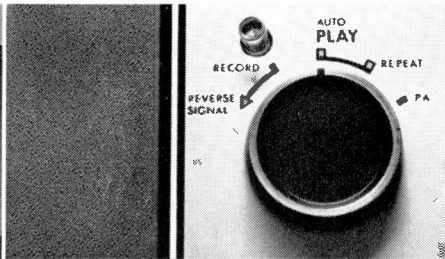
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Until another stereo tape recorder matches all the following features, the Ampex 2000 will set the standard in stereo tape recorders. Ask anyone who knows.



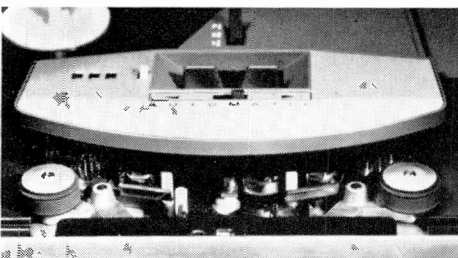
Automatic threading. Merely lay tape in slot and that's it. Thread tape in the time it took to read this paragraph.



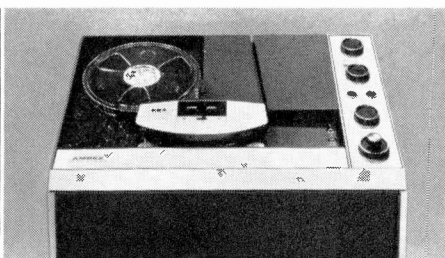
Automatic reverse. Subsonic signal can be added (by you) at any point on the tape. Result: continuous music with no fuss, no foil.

Frequency response at 7 1/2 ips
average (production run): ± 2 db, 30-18,000 cps
guaranteed minimum: ± 3 db, 50-15,000 cps
Signal-to-noise at 7 1/2 ips:
average (production run): 52 db
guaranteed minimum: 49 db
Wow & Flutter at 7 1/2 ips:
average (production run): 1/13 of 1% (.0007)
guaranteed minimum: 1/8 of 1% (.0012)

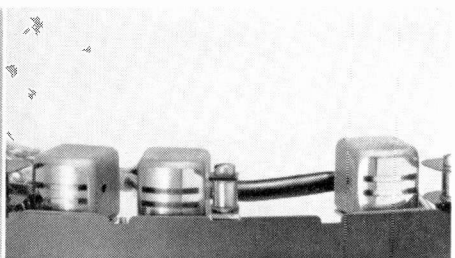
Guaranteed specifications. And only Ampex can dare do it. Reasons: only the best engineering, quality control, and materials (plus the Ampex name) go into every Ampex tape recorder.



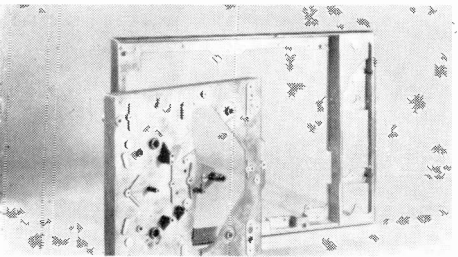
Double Capstans. Provide constant tape tension resulting in fidelity at 3 3/4 crowding that of 7 1/2 ips! Plus—eliminates the need of pressure pads. Benefit: no excess wear of the heads!



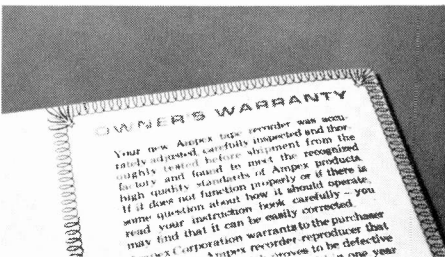
Styling. Note how form has followed function. No frills—just good looks that blend with any decor. And anyone can learn how to operate it in but minutes.



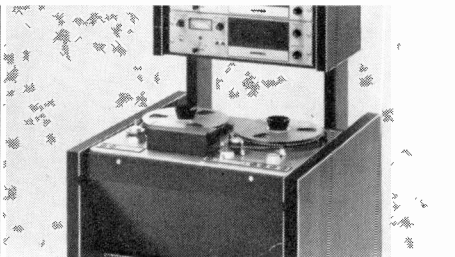
Ampex heads. The heart of the Ampex tape recorder; micro-calibrated, they're produced to professional standards and are the finest heads to be found on any amateur or semi-professional equipment.



Diecast aluminum frame (and rigid block head suspension). Built like a truck (try banging other units with plastic frames!). Keeps wow and flutter at an all-time low, low.



Quality control. Guaranteed by Ampex with their full year service on all parts and labor. Need we say more?



Professional heritage. Over 20 years of experience in every area of tape electronics for industry and the military. There's a reason why most recording studios use Ampex recording equipment.

Have we piqued your interest? We hope so . . . for we've got a most engaging and complete story to tell you about the Ampex 2000 stereo tape recorders. Write.

Ampex Corporation
Consumer Products Division
2201 Landmeier Road
Elk Grove Village, Illinois 60007
In Canada, write:
Ampex of Canada, Rexdale, Ontario.

Ask anyone who knows.



Please send me all available literature.

Name _____


Address _____

City _____ State _____

TRI

Circle 2 on Reader's Service Card

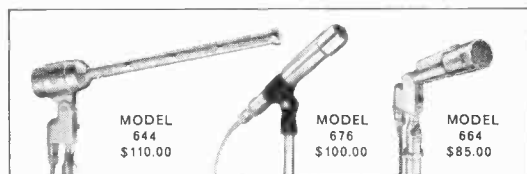
How does this 7 FOOT MONSTER help you to better tape recordings?

 The giant microphone shown here is the biggest microphone in captivity! The Model 643 is also the most directional microphone sold today. It helped E-V win the first Academy Award for microphone design in 22 years.

But beyond this, the 643 has been one of our most effective field research tools, offering a far-reaching insight into the nature of directional microphones, and their applications.

An obvious result of 643 research is our unique Model 644. Same E-V Cardiline™ principle*, but only 16 inches long. It reaches up to twice as far as any other general purpose unidirectional microphone to give you better long distance pickups than were dreamed possible a few years ago.

And this same basic research stimulated the development of our new Model 676 cardioid microphone. It uses the Continuously Variable-D® cardioid principle (a creative development from our exclusive Variable-D patent*) to provide smoother cardioid action—in a smaller unit—than any other comparable model.



But let's not ignore the most popular cardioid microphone of all, the Model 664. Here's where the Variable-D principle got its start. And since the introduction of our seven foot laboratory, the 664 has been further refined to offer better value and performance than ever before.

From such startling microphones as the 643, come continuing basic improvements—and the tools you need to significantly improve your tape recordings. Only E-V provides this kind of design leadership. With an E-V microphone you have a big head start toward better sound. After all, we're at least seven feet ahead of everybody else!

Model 643. \$1,560.00. Normal trade discounts apply on list prices shown.

*Cardiline Patent No. 3095084. Variable-D® Patent No. 3115207

ELECTRO-VOICE, INC.

Dept. 152TR, Buchanan, Michigan 49107

Electro-Voice®
SETTING NEW STANDARDS IN SOUND

Circle 9 on Reader's Service Card