

tape

50c APRIL 1965 recording

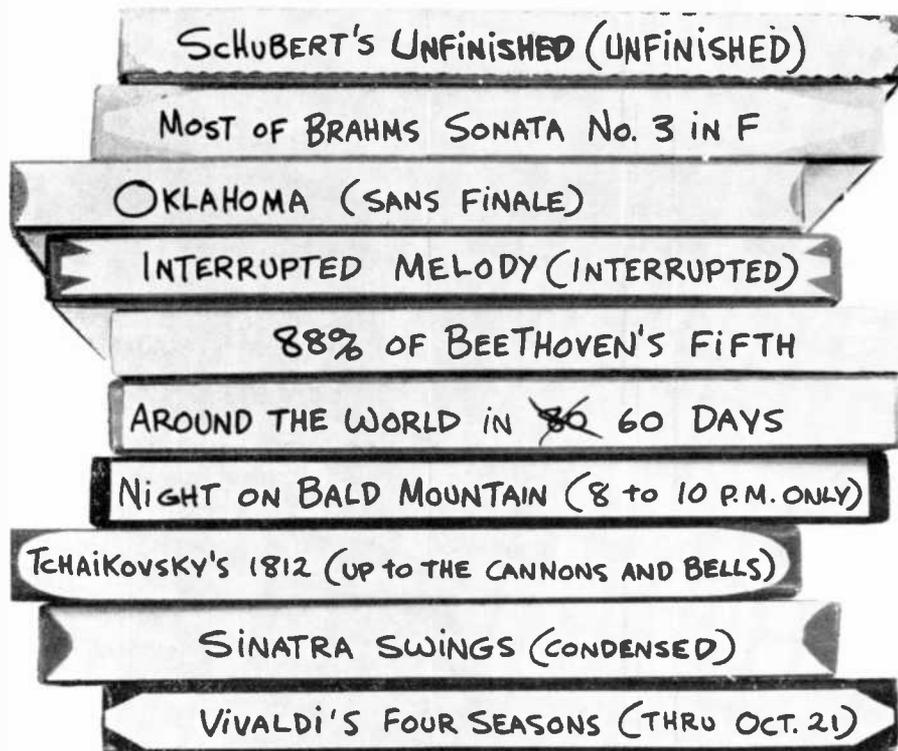
The Impact of Home Video Tape, by Douglas Edwards, Judith Crist, John Ciardi and Others / Black Market Tapes / Six Tape Recorders—How Good Are They? / The Low-down on Slow-Speed Tapes / Does Tape Teaching Work? / Tips from the Pros Broadway Shows on Tape.

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SIX HEADS ARE BETTER THAN THREE!

No matter how you look at it, six heads can outperform three anytime. And only Concertone's incomparable 800 has them. Six heads let you record or play four-track stereo tapes in both directions—without reel turnover. And Reverse-o-matic® gives you continuous music programming at the push of a single button. No one in the industry can give you six heads and Reverse-o-matic®. No one in Concertone's Series 800 price range can give you these features either.

Entirely self-contained. Twin speakers. Two microphones. Three motor system. Echo control. Sound on sound. Center capstan drive. You will be astounded at what you get with Concertone's incomparable 800. And it costs less than \$399. For complete details and the name of your nearest dealer, write Concertone, P.O. Box 3227, South El Monte, California 91733.

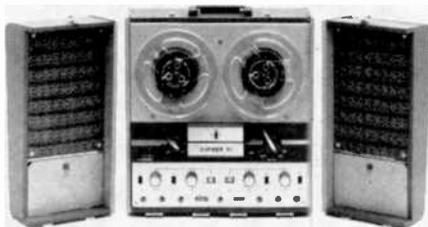
CONCERTONE 

IN CANADA: HARTONE ELECTRONICS, 298 BRIDGELAND, TORONTO, ONTARIO, CANADA
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Not shown: CIPHER V, 2-speed monaural tape recorder; \$79.50.



CIPHER I: a remarkable high-fidelity tape recorder with automatic push-button control; tape speeds $7\frac{1}{2}$, $3\frac{3}{4}$ and $1\frac{7}{8}$ ips; up to 7" reels; dynamic microphone; monitoring earphone; digital tape index; pure idler drive (no belts); \$139.95.



CIPHER VI: a 4-track stereo recorder with detachable speakers and 2 dynamic microphones; tape speeds $7\frac{1}{2}$ and $3\frac{3}{4}$ ips; 2 VU meters; automatic shutoff; digital tape index; pause control; plays horizontally or vertically; \$239.50.



CIPHER VII: a 4-track stereo recorder with detachable speakers and 2 dynamic microphones; tape speeds $7\frac{1}{2}$, $3\frac{3}{4}$ and $1\frac{7}{8}$ ips; 2 VU meters; automatic shutoff; plays horizontally or vertically; \$274.95. (Also available as the VII-D deck.)



CIPHER 800: a professional 4-track stereo recorder with 3 hysteresis-synchronous motors and 3 heads; plug-in head assembly (2-track also available); no pressure pads; tape speeds $7\frac{1}{2}$ and $3\frac{3}{4}$ ips; solenoid controlled; 2 VU meters; \$499.95.

So sorry.

It is not enough that a tape recorder is Japanese.

It must be Cipher, too!

After many years of research and development, the Japanese tape recorder industry has achieved a number of significant advances. Today, as in cameras, Japan sets a standard of excellence the West may well envy. Yet, while there are many Japanese tape recorders of good quality on the market, none measure up to the remarkable Cipher. The four Cipher models shown here are without question the most thoroughly engineered Japanese recorders seen so far. At the same time, they are priced significantly lower than tape recorders of comparable performance made anywhere else. That's why Cipher has been rated by experts as today's leading value. But don't take anyone's word for it. Ask your Cipher dealer for a demonstration.

For further information, write to Inter-Mark Corporation,
29 West 36th Street, New York, N.Y. 10018.

In Canada: Inter-Mark Electronics Ltd.,
298 Bridgeland Avenue, Toronto 12, Ontario.

CIPHER

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Tape Recording

tape

recording

MARCH-APRIL 1965

VOLUME 12 NO. 2

Articles

International Tape Underground by Hamilton Carson	15
Speakers Spread Your Sound by Hans Fantel	20
Building the Basic Tape Library (Broadway Shows) by Michael Uris	25
James Lyons Selects.....	27
Five New Slow Speed Tapes: A User's Report by Robert Angus ..	28
Stereo Microphone Techniques by John Milder	35
The Future of Home Video Tape	39

Features

Letters to the Editor	6
Tips from the Pros by Ed Zdobinski	8
Eight-Track Stereo	10
Taping FM Stereo by George Robertson	12
Tape Reviews	31
Tape Clinic	42
Tape Club News	43
Education: Tape Teaching Does It Work?—A Debate by F. Gordon Boyce and Judith Head	44
Tape Equipment Reviews	49

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Do you own one of these fine tape recorders?

If you do — and you don't own a set of Koss Stereophones — you've got a lot of fun still coming!

Koss phones are perfect for monitoring and editing in either stereo or monaural. Now you can group your favorite selections on one tape with no disturbance to or from others in the room.

Check the chart for the Koss phone which plugs directly in to your own recorder. If you don't see your recorder below, write us for a complete listing.

And for playback listening — well, prepare for an emotional lift! Just plug your Koss phones into your recorder's output jack and you'll be soaring on a solo flight of perfect sonic bliss. You'll hear every sound with startling clarity and a new "up-closeness" you've never experienced before.



SP-3X, SP-5NS, SP-5VW
\$24.95

PRO-4 STEREOPHONES
\$45.00



KOSS SP-3X
or PRO-4

SP-5NS
or SP-5VW

	1	2	3	4	5	6	7	8
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tape

LETTERS TO THE EDITOR

Washington, D. C.

The threats to civil liberty posed by electronic eavesdropping devices are not yet fully appreciated by the American public. Concerning my views on wire tapping, I have opposed such bills in the past, and I see no reason to alter my position at this time. I wish that the energy and imagination which go into developing such electronic devices capable of intruding on an individual's privacy could be turned toward developing devices to protect one's privacy.

Paul H. Douglas
U. S. Senator

Buffalo, N. Y.

Welcome back, old friend. You have been away too long for my own good—and yours. I notice that you have managed to pick up class since the old days. I knew you when. . . .

Seriously, it's a great mag, far better than it used to be. What happened? I had thought you would never come back, but when I opened my mail box this morning, there you were.

Let me know when my subscription is renewable. You have a fan here.

Ted Marks

New York, N. Y.

I usually have a wait-and-show-me - and - then - I'll - say - something-attitude. This time, I've seen it. You're great. Keep it coming.

Dennis McGuire

San Francisco

I think Mr. Arthur Whitman is a boob!

I doubt he knows anyone with the unlikely name of Horst Schwirkmann. If he does, he probably spends too much time sampling schnaps and swapping stories about the good old Bund Rally days with him rather than doing research about electronic eavesdropping.

I am a professional eavesdropper, and what I know, you wouldn't print.

Anonymous

SOMEDAY, THERE MAY BE OTHER FULLY AUTOMATIC TAPE RECORDERS LIKE THE NEW CONCORD 994



(WHY WAIT?)

The 994 gives you automatic programming. Plays or records automatically three different ways. Stops by itself where you want it to. Threads itself automatically. And, the 994 is available now!

With the transistorized 994, Concord introduces a new dimension to tape recording. Some might call it modernization, some might call it automation. We think of it as *convenience*—in playing, in recording, in starting and stopping, in threading, in hours of uninterrupted listening. You can't compare it to anything because the 994 is as different from the conventional stereo recorder as the old crank-type Gramophone is from the modern record changer.



AUTOMATIC PROGRAMMING. You can program the 994 to play or record one side of a tape from beginning to end and stop automatically. Or, to play/record first one side of the tape, reverse, play the other side, then stop automatically. Or, to play/record forward and back, forward and back, continuously, as long as you like—an hour, six hours, or all day. You may change direction of tape any time you like by merely pressing the direction change buttons. These same lighted buttons automatically show you direction of tape travel.

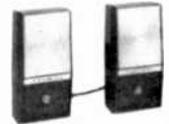
PUSH-BUTTON KEYBOARD. The operating controls are literally at your fingertips. This is the one recorder you can operate without arm waving, and with one hand! As far as threading, that's even simpler—the 994 threads itself automatically.



After all this, we didn't just stop in designing the 994. We kept going. As a result, the 994 offers superb performance and every conceivable feature required for your listening and recording pleasure. Here's a brief sample: three speeds with automatic equalization, four professional heads, two VU meters, digital tape counter, cue control, sound-on-sound, exclusive Concord Trans-A-Track recording, 15-watt stereo amplifier, professional record/monitoring system. The 994 may also be used as a portable PA system, with or without simultaneous taping.



TWO-WAY STEREO SPEAKERS. The split lid of the 994 houses a pair of true two-way speaker systems, each containing a tweeter, woofer, and crossover network. A pair of highly sensitive *dynamic* microphones is included.



The 994 is priced under \$450.* An identical recorder, Model 990 comes without speakers or microphones and is priced under \$400.* Both are at your dealer's now. So why wait? Drop in for a demonstration and find out for yourself what *fully automatic tape recording by Concord* is all about! Or, for complete information, write Dept. SR-4.

For Connoisseurs of Sound

Other Concord models from \$50 to \$800.

CONCORD 994

CONCORD ELECTRONICS CORPORATION, 1935 Armacost Avenue, Los Angeles, California 90025

IN CANADA: Magnasonic Industries, Ltd., Toronto/Montreal

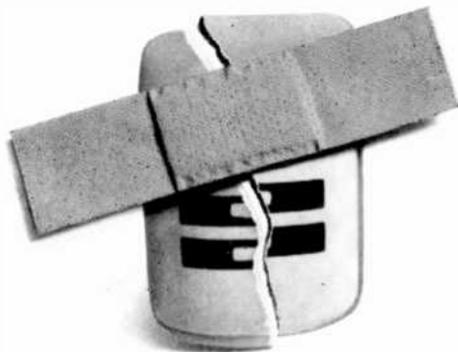
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have your head examined



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So try Reeves Soundcraft. You'll hear the clean, transparent, full-range Soundcraft sound with your very first reel. For detailed brochure on Reeves Soundcraft Tapes for every application, write today.



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tape

TIPS FROM THE PROS



EDMUND ZDOBINSKI

Edmund Zdobinski's technical background has been gained largely with Ampex Stereo Tapes, where he has more than five years' experience in perfecting tape duplicating processes.

Sooner or later, all of us have tapes to copy—either recordings we've borrowed from others and want copies of, or tapes we'd like to give or swap with other recordists.

Setting level controls properly is important in the overall quality of your duplicate. If the controls are set too high, loud passages will saturate your copy, causing distortion. If the level is too low, you'll pick up extra hiss from the copy when you play it back. Each time you transfer from tape to tape, you pick up approximately 3 db in tape hiss anyway, so it's important to take every precaution against adding unneeded hiss. At the studio to determine the loudest portion of a tape, we run it through a recorder in fast forward, checking those spots which sound particularly loud. Then we play those spots at the proper speed and check the volume levels on our duplicating units. This may sound like a very casual way of setting controls, but it

(Turn to page 48)

WHERE CAN YOU BUY 40 SOUND QUALITY FEATURES?

1. Modular construction featuring complete plug-in record amplifier, reproduce amplifier, and bias oscillator. 2. Fully solid-state electronics. 3. Hysteresis synchronous metering capstan drive. 4. Solenoid operated tape gate, brakes and pressure roller. 5. Separate reel drive motors. 6. Safely handles all tape, including half m.i.t. 7. Front panel microphone jacks. 8. Mixing inputs for high level line. 9. Front panel mode switch with tally lights. 10. Monitoring from tape or source. 11. Separate channel monitor and output switches. 12. Durable, easily cleaned, easy-on-the-eye professional vinyl finish. 13. Standard readily available American transistors and components. 14. Superior tape guiding. 15. Military type fail-safe differential band, brakes. 16. Sturdy die-cast main plate. 17. Signal switching available at remote socket. 18. Position for optional fourth head. 19. Remote "start/stop". 20. Local-remote front panel control. 21. Pushbutton-transport controls. 22. Record safety interlock. 23. New "cup" transport control. 24. Large, rugged hardened stainless steel capstan. 25. Ball bearing inertial stabilizer flywheel. 26. Payout compliance arm and tape break shut-off. 27. Automatic capstan motor stop for tape run-out. 28. Take-up compliance arm. 29. Regulated power supply. 30. Emitter-follower outputs. 31. Stereo-mono front panel earphone switch. 32. Simultaneous record and playback. 33. Double flywheel capstan drive. 34. Switchable equalization. 35. Auxiliary emitter-follower outputs. 36. Auxiliary high impedance inputs. 37. Standard "hi-fi" connectors. 38. Large "operator" type knobs. 39. Earphone monitor jack on front panel. 40. V.U. meter for each channel.

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DIMENSIONS: 19" wide, 15-¾" high, 12" deep.

Unprecedented in our industry, Magnecord, America's first manufacturer of magnetic tape recorders, now introduces a unique model. The NEW Magnecord 1024 offers you the highest possible quality at the lowest conceivable price! For professional sound, design simplicity, moderate price, engineered performance and quality throughout — BUY the most versatile of them all . . . BUY the NEW 1024!



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2-track model . . . \$347.95
Walnut enclosure . \$ 18.95



Viking OF MINNEAPOLIS, INC.

9600 Aldrich Ave. So. Minneapolis, Minn. 55420

tape

EIGHT TRACK STEREO

Now it's eight-track stereo. The head which does the job has just been developed by Nortronics Inc. of Minneapolis, Minn. Before you scrap your four-track stereo recorder and your library of four-track tapes, however, you may be interested in the advice from Nortronics that the head is designed for special applications rather than for ordinary or high fidelity home listening. "We created it in order to give us twice as much playing time on tape in car players," a Nortronics engineer told **TAPE RECORDING**. "You lose about 3 db in signal-to-noise ratio over a conventional four-track stereo head because you're recording a signal on less than half as much tape. This could prove annoying to the home listener. But with all the other noises in a car, who's going to notice it?"

Nortronics is concerned only with the manufacture of the head itself. But the engineer noted that a cam arrangement will be built in by manufacturers using it to enable the listener to shift back and forth among four sets of stereo tracks or eight monaural tracks. "It's engineered to be used at 3 $\frac{3}{4}$ ips, although there's no reason why it couldn't be used at other tape speeds as well. At this speed, the frequency response is about 100 to 10,000 cycles or so — substantially better than that of an FM car radio." He noted that the head lends itself to certain types of commercial sound installations as well as to auto tape players. "We'll be selling it through audio dealers as well as direct to manufacturers. If anybody wants to rip the four-track head out of his Ampex and substitute one of these, we're not going to stop him. But that's not what it's made for."

The new head records eight tracks, each 20/1000" wide, with a head gap of 100 microns.

Some plain talk from Kodak about tape:

Kodak
TRADEMARK

Sensitivity and frequency response

Controlling every electrical factor involved in the making and using of sound tape is a bit like trying to watch a three-ring circus . . . it can be done, but you need fast eyeballs. Let's discuss two critically important parameters: sensitivity and frequency response.

Sensitivity means the degree of output for a given input.

We put in a 400-cycle signal and measure the output. The result: low-frequency sensitivity. We choose 400 cycles for a number of good reasons. A 400-cycle note recorded at 15 inches-per-second gives us a wave length that the tape "sees" of roughly .0375 inches, and by a happy coincidence this wave length penetrates the entire depth of the oxide coating, but not the support material. Everything else being equal, low-frequency response is a function of the thickness of the coating. The thicker the coating, the better the bass response. We test at a frequency that penetrates the entire coating. We choose 400 cycles instead of, let's say, 20 cycles because the 400-cycle note tells us just as much—and has an added advantage. An engineer can *hear* 400 cycles, so we have audio monitoring as well as instrumented observation on a scope face.

Just as the low-frequency sensitivity test gives us an idea about oxide thickness, the high-frequency test gives us a fairly accurate picture as to just how smooth the surface of the tape is. Good high-frequency response is impossible on a tape having a rough surface. Here's why: The low points will represent gaps in the oxide and cause a loss of H.F. response. We test our high-frequency sensitivity at 15,000 cycles. (Inches-per-second divided by cycles-per-second gives us recorded wave length.) So at 15 ips the arithmetic looks like this:

$$\frac{\text{inches}}{\text{second}} \div \frac{\text{cycles}}{\text{second}} = \frac{\text{inches}}{\text{second}} \times \frac{\text{second}}{\text{cycles}} = \frac{\text{inches}}{\text{cycles}} \text{ which is wave length } (\lambda)$$

THUS:

$$\frac{15 \text{ inches}}{\text{second}} \div \frac{15,000 \text{ cycles}}{\text{second}} = \frac{15 \text{ inches}}{\text{second}} \times \frac{\text{second}}{15,000 \text{ cycles}} = \frac{1 \text{ inch}}{1000 \text{ cycles}} = 1 \text{ mil wave length}$$

At this high frequency (short wave length) we are recording only on the surface of the tape. If any roughness is present, big troubles result. If you have a surface condition where the amplitude of the roughness is just .0001 inches and your recorded signal has a 1-mil wave length, you will lose 5.5 db in high-frequency response! Let's rephrase the catastrophe. It takes a surface variation of just one tenth the wave length to knock down response by about 6 db. And this can happen at any frequency!

We are working toward making a point: KODAK Sound Recording Tape has a surface that is unsurpassed in smoothness, a surface that varies no more than 25-50 millionths of an inch from a theoretically perfect plane.

Frequency response is merely the arithmetic subtraction of high-frequency sensitivity from low-frequency sensitivity. Ideally the response is zero. It's quite an easy matter to juggle the characteristics of an oxide around so that frequency response is nice and flat. For instance, if your oxide has poor high-frequency sensitivity, you can reduce the thickness of the oxide layer. This will degrade L.F. sensitivity, and thus effect a flat response. But is the resulting L.F. loss worth it? We don't think so. That's why we designed our

coating to give us superior low- and high-frequency sensitivities, as well as a nice flat response.

Next time we'll chat about a few other basic considerations.



Choose KODAK Sound Recording Tape, Type 31A, for all general-purpose and low-print applications. Or Type 34A whenever you need high-output or low-noise characteristics. For extended playing times try our extra- or double-play tapes . . . or try the new triple-play tape—so thin you get 3600 feet on a 7-inch reel. KODAK Sound Recording Tapes are available at electronic supply stores, camera shops, specialty shops, department stores . . . everywhere.

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EASTMAN KODAK COMPANY, Rochester, N. Y.

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or
later...



you will demand the extra quality and precision of Nortronics tape heads! All Nortronics heads feature:



laminated core structures and deposited quartz gaps for superior high frequency response, and . . .



hyperbolic, all-metal faces for intimate tape-to-head contact—longer wear with minimum oxide loading.

Replace worn tape heads with Nortronics laminated core replacement heads—available from your Hi-Fi Dealer, Radio-TV Serviceman or Camera Store!

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tape

TAPING FROM FM STEREO

By George Robertson

Taping off the air, as Hans Fantel mentioned in these pages last issue, is a highly economical way to build a library of music on tape. It's also a great deal of fun. The purpose of this column is to alert you to some of the more interesting events to be aired during March and April, with an occasional tip on taping.

* * *

Metropolitan Opera live broadcasts during March and April include performances of Richard Strauss' *Salome*, Verdi's *Aida*, *Madama Butterfly* by Puccini, Giuseppe Verdi's early opera *Ernani* and Puccini's *Tosca*. Here are the approximate times for each act, as performed by the Metropolitan:

March 13— <i>Salome</i>	90 min.
March 20— <i>Aida</i>	
Act I Scene 1	20 min.
Scene 2	11 min.
Act II Scene 1	17 min.
Scene 2	25 min.
Act III	30 min.
Act IV Scene 1	20 min.
Scene 2	11 min.
March 27— <i>Madama Butterfly</i>	
Act I	48 min.
Act II	49 min.
Act III	32 min.
April 10— <i>Ernani</i>	
Act I Scene 1	11 min.
Scene 2	26 min.
Act II	27 min.
Act III	21 min.
Act IV	16 min.
April 17— <i>Tosca</i> (last broadcast of the season)	
Act I	45 min.
Act II	42 min.
Act III	30 min.

* * *

In most localities in the United States, the Metropolitan Opera broadcasts are available on FM as well as AM stations. No stations carry these programs in stereo,

however. If you're beginning your library of Metropolitan performances on tape this month, you'll probably be taping the broadcasts monaurally on a four-track recorder at 3¾ ips. Unless you live within range of the signal of WOR-FM in New York, which transmits the live signal direct from the Metropolitan stage, you're making no sacrifice of fidelity to do so. The telephone lines used to connect the Metropolitan's FM network are of lower fidelity than that of most good recorders operating at 3¾ ips. The playing time you gain by using the slower speed will help you avoid annoying interruptions in the middle of a scene or aria. Even listeners in the New York area who tape from AM radios or table model FM sets probably won't lose anything by taping at the slower speed.

* * *

Tape recordists in the vicinity of Meriden, Conn. who want to pick up some pointers on taping off the air, want to check their equipment, or are just interested in keeping up with what's new in hi-fi may be interested in *Hard Facts*, a weekly feature of WBMI. The program, hosted by WBMI's general manager Ray Hard, may be heard at 8:30 PM on Thursdays. "We use test tones, demo records, just about everything to help the home listener judge his own rig," Hard said in describing the show. Perhaps its most interesting feature, however, is a musical selection Hard plays during each show. He tells recordists just how long the record will run and plays its loudest passage before playing the entire record, to enable listeners at home to set their controls. The show, of course, is broadcast in stereo, enabling Nutmeg Staters to build a cheap library of stereo music.



Introducing 2 new additions to the widely acclaimed Stratophonic Series

the totally new
sound is why...

harman kardon

Stratophonic is the largest-selling all-transistor stereo receiver today

Clean, pure, *spacious* sound . . . a sound never before achieved in stereo . . . is the reason for the great popularity of the three Stratophonic FM stereo receivers introduced last Fall. Freed at last from the heat and distortion of tubes and output transformers, the majestic Stratophonics offer *Sound Unbound* in your choice of IHFM music powers from 36 to 75 watts, at prices from \$279* to \$469*. And now, with the addition of the two new components shown at right, the Stratophonic line includes five 100% solid-state instruments for every listening wish.

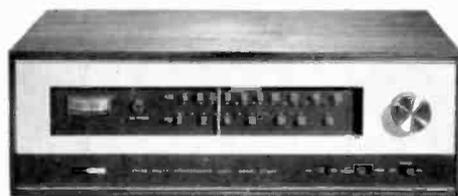
Harman-Kardon, Inc., Philadelphia, Pa. 19132. A subsidiary of The Jerrold Corporation.

LEADER IN SOLID-STATE STEREO COMPONENTS

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Model SA-2000 All-Transistor Integrated Stereo Amplifier. 36 watts IHFM music power (18 watts per channel). Response flat (± 1 db at 1 watt, normal listening level) from 8 to 25,000 cps. Direct speaker coupling without output transformers results in speaker damping factor of 25:1. Complete controls and stereo headphone jack. \$159*.



Model ST-2000 All-Solid-State AM/FM Stereo Tuner. No tubes (not even nuvistor tubes) to cause heat, drift, or distortion. This fine tuner handles strong input signals without overload or crosstalk. Multiplex separation 25 db. Usable FM sensitivity 2.9 μ V IHFM. AM sensitivity 50 μ V/meter. \$199*.

*Prices slightly higher in the West. Walnut enclosures optional.



International Tape Underground

by Hamilton Carson

As the applause died away and the lights went up at the Metropolitan Opera one evening recently, a heavy-set young man took something from under the coat he held on his lap, stuffed it into his pocket and slipped out into the night. The next day a midtown Manhattan record dealer offered his customers a complete recording of the evening's performance on tape—at a price of \$11.

These two—the young man in the auditorium and the record dealer—are just two members of an international group which, for want of a better term, have been dubbed the International Tape Underground. International because its members can be found in England, Italy, Germany, Canada, even Australia and Japan. Tape because this medium has made possible the recording and duplicating of music at extremely inexpensive levels and Underground because their activities are strictly illegal.

The idea of recording music off the air isn't exclusive with the International Tape Underground. All recorder owners do it. But the idea of selling music taped off the air or recorded in auditoriums such as the Metropolitan on a systematic basis is. The International Tape Underground, then, is an informal organization of tape recordists scattered around the globe who do the actual recording and who are affiliated with record dealers in major cities in the United States (and presumably in major cities elsewhere such as London, Hamburg and Milan), who buy the tapes and resell dubbings to customers at inflated prices.

Just what sort of tapes are these people selling? Why would anybody in his right mind pay up to \$30 for a monaural recording of an opera, frequently of dubious fidelity? The Underground's activities aren't confined to opera, although that seems to be one of its most lucrative areas. You can buy song recitals by the late Jussi Bjoerling, piano recitals by the late Artur Schnabel or Walter Gieseking, drama recorded in England by the BBC and jazz by Charlie Parker and others. But the mainstay of the Underground is grand opera—recorded off the air in Britain and the U.S., in auditoriums such as La Scala in Milan or the Met in New York.

Opera buffs for years have been playing a game called "What If—." It goes something like this. Player Number One asks, "What if we'd had tape recorders when Rosa Ponselle made her debut in *La Forza Del Destino* back in 1917 with Caruso in the cast?" And Player Number Two counters with, "What if somebody had thought to record Joan Sutherland singing Handel before she went to Covent

Garden?" Player Number Three pines for a performance by the Metropolitan of Gomez's *Lo Schiavo*—"They did it in Rio five years ago, you know." The game shifts from player to player, each offering his favorite daydream of what might have been.

What the International Tape Underground has done, insofar as possible, is to fulfill some of these daydreams—and to charge a stiff tab for doing so. The late Ezio Pinza, Giovanni Martinelli, Lawrence Tibbett and others such as Helen Traubel never appeared in complete opera recordings. But the International Tape Underground can supply you with a 1940 performance of *Lakme* featuring Pinza and Lily Pons. Or Lawrence Tibbett as *Rigoletto*, recorded in 1939. Of more recent vintage are Joan Sutherland as Donizetti's *Emily of Liverpool* and Renata Tebaldi, recorded off the air in Italy before she became an international celebrity. There are also recordings of recent performances by such artists as Jussi Bjoerling, Renata Tebaldi, Tito Gobbi and Fernando Corena who, because of contractual agreements with record companies, are never likely to turn up on commercial tapes.

The recording list offered by one Underground dealer runs to 22 single-spaced pages, and includes recordings made as long ago as 1937. Obviously, some of these early items weren't made on tape (investigation reveals they were made originally on home disc recorders and transferred much later to tape). The sound quality varies from poor to quite good—as is the case with many of the later recordings as well. No matter how bad the sound, the price is approximately 20 cents per minute of music, whether you have the tapes duplicated at 7½ or 3¾ ips. With the introduction of the wire recorder at the end of World War II and later the switch to tape, both the volume and the sound quality of these items picks up. The introduction of small transistor recorders with reasonably good fidelity in the last year or two has added even more material to the market, although these tapes frequently feature coughs and shuffling of feet rather than the music and singers they promise. To the collector who really won't be happy until he can show off his 1938 taping of *Simon Boccanegra* starring Pinza, Tibbett and Rethberg for his friends, \$25 is a small price to pay. In some cases, it's possible for him to amortize this high initial investment by splitting the cost with several collector friends, each of whom receives a dubbed copy.

What's illegal about all of this, according to the record companies and the performers, is that the members of the Underground are using the fruits

of other people's labors to make a buck. "They're nothing but thieves," says Angel Records former artistic director Walter Legge, whose wife, soprano Elisabeth Schwartzkopf, is a favorite performer of the Underground. Legge explains that when artists such as Miss Schwartzkopf make a recording, they receive a few cents' royalty on each record sold. This royalty stays with the Underground when they tape her off the air. Courts in the United States and most of the Free World have upheld this view, and have forced pirates (as Legge refers to them) to pay royalties when caught. Some artists have also argued (and the courts have agreed) that recordings made by amateurs under unfavorable conditions and then sold tend to hurt the reputation of the performer. The late Arturo Toscanini was one artist who refused to allow some of his performances to appear on records because he was dissatisfied with the sound. Some of these now are available through the Underground.

The largest target of clandestine recording in America, however, remains the Metropolitan Opera, which makes it easy for the Underground by broadcasting performances regularly each Saturday afternoon during the season. Is the Met aware of the situation? "Certainly," an executive involved in the Saturday broadcasts admits. "We know that thousands of people across the country tape the broadcasts, some of them in clubs. We know that there's an exchange of tapes among opera buffs—some of them using the columns of your magazine. And we know that a few people are out to make money. However, I doubt if there are more than a thousand or so people who are willing to pay the price for these pirated tapes. As long as it remains at that level, it would cost us more to investigate and prosecute than to ignore it."

Author David Hall has suggested that a national archive be set up which would include these tapes, as well as recordings of merit deleted by American and foreign record companies. Under Hall's plan, scholars and serious listeners could buy tape dubbings from the foundation administering the archive at a reasonable price. The fee would include the overhead involved in making the dubbing plus the necessary performer, broadcaster and recording company royalties. Such a plan, he feels, would help to offset the substantial deficits run up every year by performing organizations such as the Metropolitan and the New York Philharmonic.

"We do have something like that under consideration," says the Met's assistant manager Francis Robinson (an avid collector of rare recordings himself), "but the legal problems are enormous. First, there's the problem of looking up all the artists involved, some of whom are dead or have been out of the musical picture for years. We might put





something out and then find ourselves slapped with a suit by the heirs of one of the singers. Then, of course, there's the union problem." The Met, already has enough day-to-day problems with artists, repertory and budgets, so the prospect of dealing with a whole host of additional legal entanglements concerning royalties such as would be involved in a reissue of this type is not inviting. Still, Mr. Robinson's tone wasn't pessimistic, and if a way can be found to overcome the numerous barriers, the opera company, perhaps in cooperation with its loyal sponsor of 25 years, Texaco Inc., might cut off this major source of Underground material by making the tapes available itself at reasonable prices.

Even without the Metropolitan, however, the Underground has a number of sources for material. Just a few of them include Radiotelevisione Italiana, which regularly broadcasts performances of lesser-known Italian operas, frequently with young artists (some of the performers who have appeared in these include Franco Corelli, Maria Callas and Renata Tebaldi); NBC Television's Opera Theatre; Nordwest Deutsche Rundfunk, which specializes in German and modern works; the British Broadcasting Corporation, which has a little of everything to offer, frequently with artists like Victoria de los Angeles and Joan Sutherland; The Canadian Broadcasting Corporation, which specializes in modern works but broadcasts a little of everything during the course of the year; live performances recorded at the Rio de Janeiro Opera, La Scala, Covent Garden, the Hamburg and Rome Operas, and elsewhere. In some cases, the individual who records the original broadcast off the air may not knowingly be a part of the Underground. But if he swaps extensively with other opera buffs, his tapes eventually may wind up in the hands of someone who'll sell them to one of the Underground dealers. And a new title is in the Underground catalogue.

One such incident occurred one night in January, 1957, when a battery-operated portable recorder and a bespectacled gentleman took their seat at Carnegie Hall. The singer of the evening was Maria Callas, appearing with the American Opera Society, and the battery recorder was on hand to capture every note. Insiders always look on this evening with wry humor. For it was one of the first cases where a battery recorder was used inside an auditorium to pirate a performance. And what was it Mrs. Callas was singing that evening? A little-known Donizetti opera entitled *The Pirate*.

A sample page from one International Tape Underground catalog includes operas taped off the air in Italy, Germany, Austria and Britain, as well as the United States. In addition, it shows performances taped in New York's Metropolitan Opera, the Hamburg Opera, the Vienna and Salzburg festivals.

Artists include Maria Callas, and Boris Christoff, Kirsten Flagstad, the late Ezio Pinza, Elisabeth Rethberg, Lawrence Tibbet, among others. Note that the catalog page includes no prices. Black market dealers prefer to charge what they think the traffic will bear.

HIGH FIDELITY RECORDS • TAPES • AUDIO EQUIPMENT

VERDI

Il Trovatore Met 1961 Corelli - Price - G
 La Traviata NBC TV (in English) - G
 I Vespri Sicilliani-Cerquetti, Christoff, -RAI - G
 I Vespri Sicilliani-Callas Christoff- RAI - F
 Simon Boccanegra-Met opera 1960 - G
 Simon Boccanegra - Cetra set
 Aroldo - RAI - Turin - G
 Don Carlos Met opera 1955 - G
 Don Carlos Covent Garden - BBC 1958 - G
 Don Carlos 1958 Salzburg Festival - F
 Don Carlos opera 1960 - F
 Nabucco exc Hamburg State opera in German - F
 Quartet E minor - G
 Attila - RAI - (Itala Tajo) - G
 Simon Boccanegra- Met1938- Pinza, Tibbert, Rethberg
 Otello Met - 1963
 I Due foscari - RAI - G
 La Battaglia di Legnano - RAI - La Scala- Corelli- Stella-
 Ernani (Met-opera) 1962 Bergonzi,Prine,MacNeil, Tozzi - G
 L'Ampifarnaso

VECCHI

VERETTI

VILLA, LOBOS

VIRGIL, THOMAS

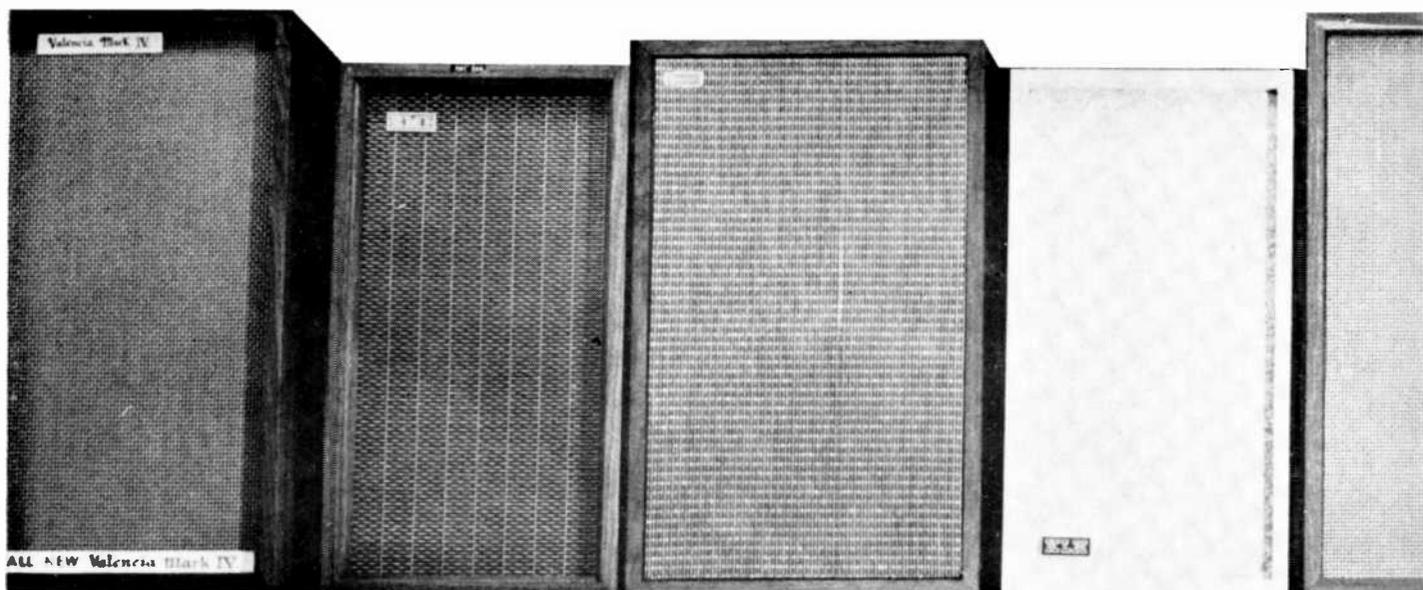
VIVALDI

VON EINEM

VORISEK

WAGNER

Burlesca (1 act opera) - RAI - G
 Quatuor
 The Discovery of Brazil oratorio imported Pathe
 Missa Pro-Defunctis- composer conducting - G
 Cello Concerto
 La Fida Ninfa - RAI- 1962- F
 Stundelied, cantata Hamburg Premiere- F
 Ballade for Orch-Szell, Salzburg- G
 Symphony D major - deleted Supraphon record
 Piano Sonata - G
 Wesendonck Songs- farell, Stokoski- deleted Victor
 Flagstad selections- deleted Camdan
 Rienzi-(2 hour Abr. Treptow, Heger
 Rienzi-(2 hour Abr. Kripps, Vienna Fest. - G
 Rienzi- Prayer Melchior,, from 78's
 Tannhauser Met 1936 Flagstad, Melchior- RP
 Tannhauser Met 1960-G
 Tannhauser Hymn to Venus, Rome Narrative- Melchior, 78's
 Das Liebesverbot (1½ hour abr.)
 Lohengrin Met 1943 Melchior, Thorborg, Cordon,-G
 Tristan Met 1949, Melchior- G
 Die Walkure (complete 2/17/40) Met opera Melchior, Flagstad
 Lawrence, Huehn
 Tannhauser Met 1942 (Melchior, Traubel, Kipnis, Thorborg)
 Adagio, Clarinet & String Quartet
 Die Feen (exc) Koing, Die Hochzeit- Dvertures -BBC-
 Fliegender Hollander- Complete-Solti, Vienna- London commercial
 Steerman's Song-Melchior- from78's
 Lohengrin - complete- Met 1940 Melchior,Rethberg-RF
 Bayreuth, 1959-
 Bridal Chamber Scene-Flagstad, Melchior- deleted Victor



Speakers Spread Your Sound

by Hans Fintel

If you've never connected your tape recorder to a set of full-range speakers, you're in for a surprise. You'll discover tonal details on your tapes you perhaps never realized were there. The thump of the base fiddle is likely to hit you with unsuspected force. The cellos and low brasses will emerge with a new feeling of weight, and more convincing reproduction of kettledrums will enrich the music with their profound punctuation.

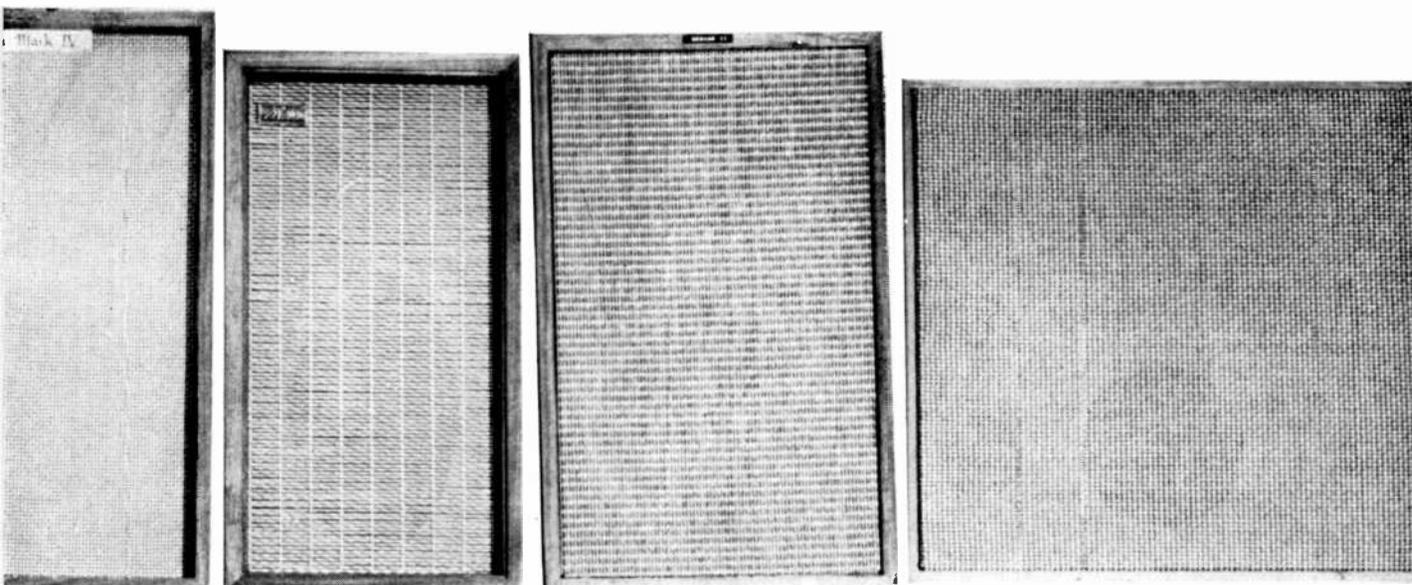
Fortunately, it's neither difficult nor overly expensive to obtain such gratifying performance. Most recorders have a special set of jacks, usually marked EXT SPKR (or words to that effect) for plugging in those auxiliary loudspeakers. And when the external speakers are plugged in, the recorder's built-in speakers automatically fall mute in most machines. The built-in loudspeakers on most machines are quite adequate for their intended task—monitoring your tapes. But for serious listening, they frequently have two drawbacks. Most are separated by only a foot or two, thus cramping the spread stereo is intended to give. And because they are comparatively small, they can't give the full-frequency reproduction of a wide-range component loudspeaker system.

There are three major types of speakers which you can use as companions for your recorder—those sold by recorder manufacturers and designed specifically for use with tape recorders, those standard component models which can be used with relatively

low-powered recorder amplifiers, and those intended to be used with more powerful amplifiers (either separate components or those found in the more expensive recorders). The current high fidelity catalogues abound with units in each group. Some of these may not rival the ultimate perfection of big speaker systems powered by 100-watt amplifiers, but they can provide fuller, more natural bass sound and a less boxy quality for all of your tapes.

To serve as an auxiliary to a portable tape recorder, a loudspeaker must meet two requirements: it must match the recorder's output impedance, and it must be efficient enough to provide full volume without straining the recorder's power capacity. The first of these points is easily settled. Impedance is a characteristic of electrical circuits measured in ohms. The output impedance of most tape recorders is eight ohms (though some are rated at four ohms). You may find this figure in the instruction booklet provided with your machine. Loudspeakers also have a specified impedance, which you'll find marked either on their backs or stated in their specification sheet. All you have to do is to make sure that the impedance rating of the speakers you buy is the same as the output impedance of your recorder. It's as simple as that.

Efficiency, however, is one of the best-kept secrets of the audio trade, to judge from most manufacturers' loudspeaker literature. Efficiency denotes how much amplifier power a loudspeaker needs to produce a certain loudness. To say that a speaker is inefficient casts no aspersion on its quality (indeed, some of the most sought-after speakers on the market today are very inefficient). It merely says that it uses a fairly large amount of amplifier power. Since most tape recorders deliver less than 10 watts output per channel (many even less than five watts), they require very efficient loudspeakers to provide room-filling volume. Since many recorder manufacturers are as eager to hide the power output of their recorders from the public as speaker manufacturers are to conceal the efficiency of their units, matching the two occasionally can be a chore.



Among the speakers sold by recorder manufacturers for use with their own or other tape recorders are models from Wollensak, Roberts, Tandberg, Ampex, Concertone and others. The Ampex and Tandberg models, for example, are indistinguishable from comparably-priced component bookshelf loudspeakers, both in terms of sound and styling. The Ampex 2015, for example, retails for \$79 and contains an 8" woofer and three-inch tweeter in a walnut enclosure. Like the model 1015, which costs \$10 more, it was intended originally as a companion piece for an Ampex tape recorder. But it's an excellent addition to any make of recorder, and its styling permits its use with just about any machine. Tandberg's CX-266, also priced at \$89, consists of an 8" coaxial loudspeaker mounted in a teakwood bookshelf enclosure. Wollensak's S-422 Stereo Twins are somewhat smaller in size and somewhat less expensive. Styled to be used primarily with Wollensak recorders, the speakers promise a frequency response of 60-15,000 cps \pm 5 db—or slightly less than the capabilities of the Ampex and Tandberg units. Lucor and Korting both offer moderately-priced small bookshelf systems styled to match the decor of their recorders.

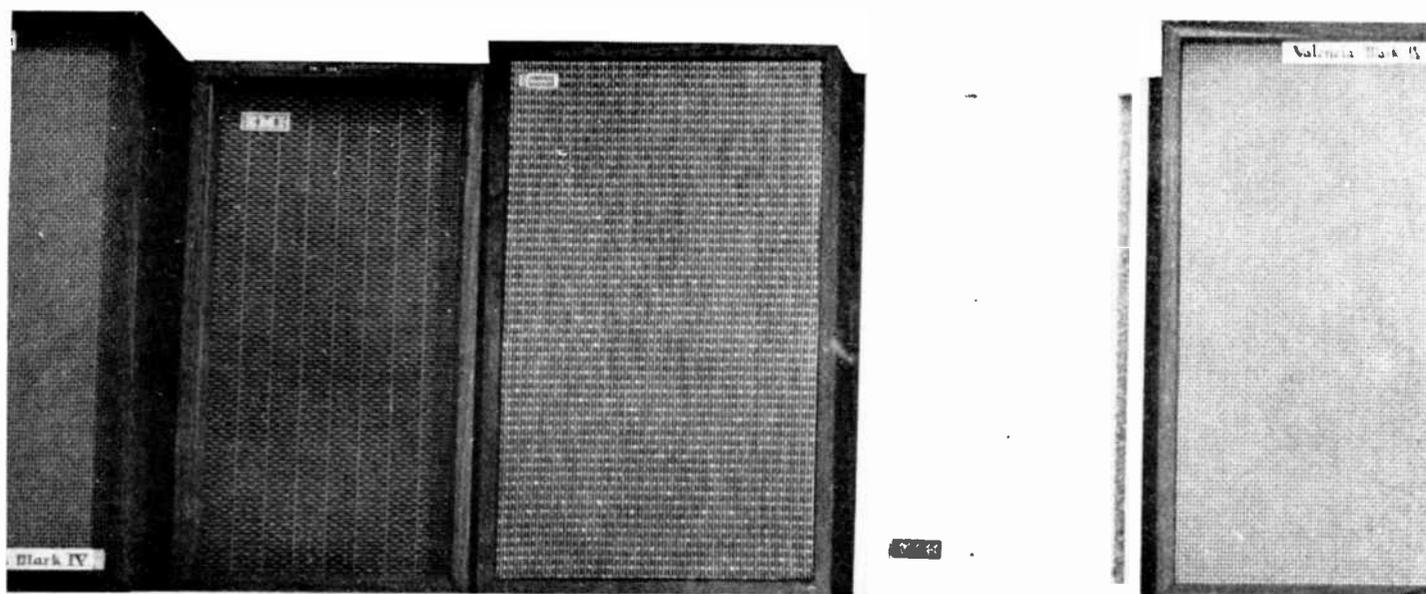
If you'd rather mount your speakers in corners than on bookshelves, Tandberg and Roberts both have speaker systems which may be of interest. The latter's S-903B, at \$120 per pair, are two corner luggage-type enclosures equipped with 8" full-range speakers. Tandberg's CS40 is priced at \$87.50. Like the Roberts, they're shaped to fit into the corners of your room and project their sound diagonally toward the center. They also can be mounted near the ceiling in order not to take up any floor space.

The least expensive among the current crop of small component-type high-efficiency speakers is the Heath AS-81. At a list price of \$17.50, it crams a six-inch woofer, a three-inch tweeter and crossover network into a box measuring $10\frac{3}{4}$ " x $6\frac{1}{2}$ " x $6\frac{3}{8}$ ". It's built specifically for amplifiers with limited power—in fact, it handles only about six watts' amplifier output, which makes it just about right for lower-

priced and medium-priced tape recorders. If your purse-strings aren't quite that tight, you'll find an attractively styled cabinet in the Electro-Voice Coronet speaker system, which sells for \$30. This model, styled in walnut with brass trim, comes in a kit rather than fully assembled. But don't let that frighten you. All the panels are pre-cut and pre-drilled so you can put it together in little more than half an hour. You don't even need any tools—not even a screwdriver. Wing nuts are supplied in place of screw heads, so you can do the job with your bare hands.

Among other speakers in this general area, one might consider the popular Frazier "Midget" which offers surprisingly good sound in an extremely compact enclosure for a price of \$30. For the same price you can get Eico's HFS-10 system, with a $6\frac{1}{2}$ " woofer, a 2" tweeter and the compact dimensions of 12" x 18" x $5\frac{1}{2}$ ". Either speaker is highly efficient and matches the 8-ohm impedance of most machines. And if compactness is a main consideration, you may also take a listen to University's Mini-Flex II, which sells for \$50, measures 15" x $8\frac{1}{2}$ " x 6" and contains a $6\frac{1}{2}$ " woofer and $3\frac{1}{2}$ " tweeter.

So far, we've been discussing add-on component speakers for recorders in the \$250 and under category. Now let's move up to some of the models which making fitting companions for an Ampex or a Magnecord. As a general rule, the quality of the extension speaker you buy should match the quality of your recorder. If you own an inexpensive machine that falls short of high fidelity standards, even the best external speaker can't make up for the deficiencies. Conversely, if yours is a first-rate unit capable of clean, wide range sound, you need an extension speaker of equal merit to allow all the potential sound quality to be heard. You'll find, too, that once you've got a good tape recorder, the least expensive way to a complete component rig is to add two quality loudspeakers. Later, you can add an amplifier, tuner and record player as your budget allows without the need for speaker replacement.



Ideal models for this purpose are available from a number of manufacturers, and include the Ampex and Tandberg models already discussed. Besides Electro-Voice and University Loudspeakers, those offering high-efficiency speakers ideally suited for use with a good recorder are James B. Lansing Sound and Wharfedale Loudspeakers. Take the JBL Lancer 33, built around an 8" full-range speaker mounted in an enclosure measuring 12¾" x 23¼" x 11¾". It produces sound from 35 to 15,000 cps. and sells for \$93 each. Another JBL possibility you might consider is the Lancer 77 at \$156.

Wharfedale's two bookshelf speaker models, W40 (\$83.50) and W60 (\$122.50), can be used with recorders having as little output power as five watts per channel. Both are approximately two cubic feet in size, and come finished in oiled walnut or polished walnut. Economy models of each are available at a saving of about 10 per cent. If you're looking for something a bit more elaborate, there's the W70, a lowboy system costing \$172.50 finished in a variety of styles and requiring six or more watts from your tape recorder.

There are a very limited number of relatively expensive recorders which have power outputs in excess of 10 watts. Or you may care to consider adding a component amplifier as well as a pair of loudspeakers to your rig. If you do, the choice of speakers available to you broadens considerably, for the extra power can drive speakers of less efficient design. Among these you might consider such recent compact models as the Fisher XP-5 (\$54.50), the Acoustic Research AR-4 (\$57), the Scott S-5 (\$60), the Jensen PR-50 (\$54) and the KLH Model 17 \$69.50. Without going into detail, it suffices to say that as a group, these speakers, despite their compactness and moderate price—and within a certain range of individual variation—live up admirably to high fidelity standards.

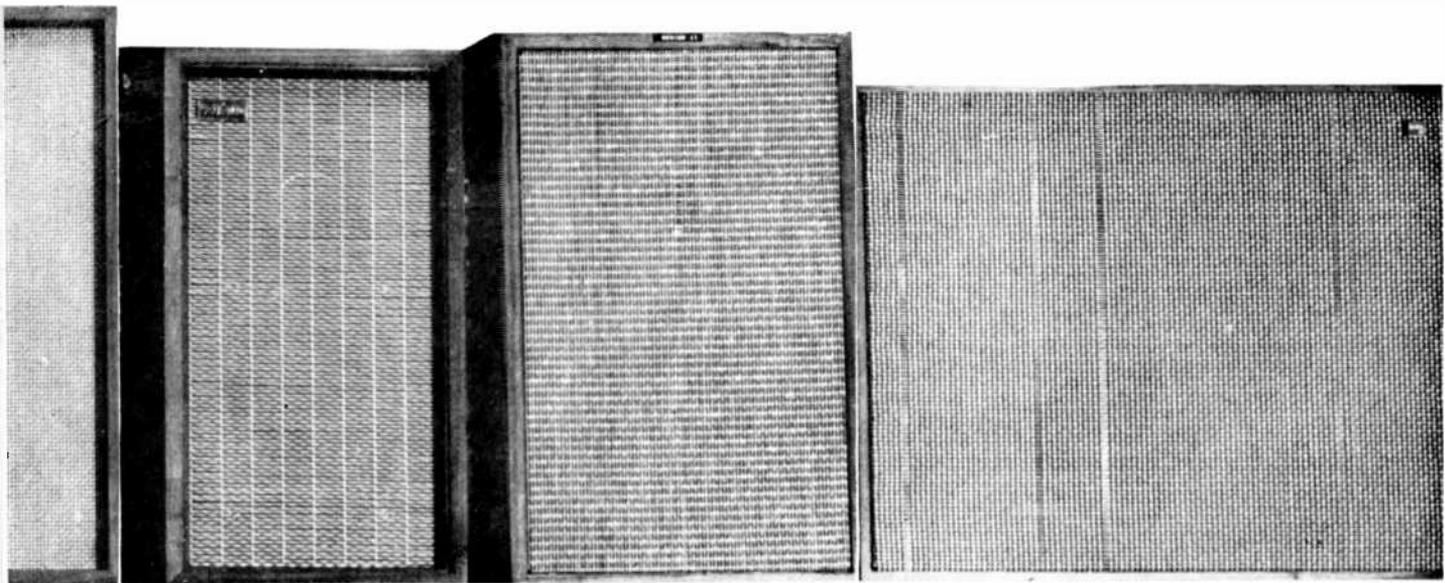
Judge any speaker with your own ears before you buy. Technical specifications such as frequency response don't really tell you how a speaker sounds. For a loudspeaker embodies many subjective factors of tonal character that can't be set down statistically

on paper. No two speakers sound exactly alike, even though their technical specifications may be identical. They differ as a Stradivarius violin does from an Amati, or a Baldwin piano from a Steinway. These variations are due to the coloration imparted by the speaker to the original sound. Ideally, such coloration should be at a minimum, so that the original sound of the music reaches you wholly unadulterated. But few, if any, loudspeakers are capable of approaching this ideal.

Within limits, these variations may prove helpful, for they allow you to choose a speaker whose tonal character matches your own taste. If you like to sit first-row center at a concert, a bright-sounding speaker will convey to you the feeling of being very close to the players. On the other hand, if you normally prefer a good balcony seat where the instruments sound more distant and better blended together, you'll find loudspeakers with a more remote and warmer timbre more to your liking.

Personal taste notwithstanding, there are a number of points by which you can judge a speaker fairly objectively. As you listen, keep the following questions in mind: Can you pick out the individual instruments in the orchestra? Can you separate the double bass from the tuba when both instruments are playing in unison? Do the violins have a silken sheen? Is there solid weight in the sound of the cellos? Does the percussion sound crisp and sharp? Does the brass come through with a tingling edge but without harshness? These questions will keep you alert to the important quality factors in loudspeaker performance. And to make sure the speakers you're considering really match your recorder, bring it to your audio dealer and ask him to connect the speakers to your machine.

One important rule in comparing loudspeakers: play them all at the same volume. If one speaker is louder than another, the ear fools you and invariably makes the louder speaker seem preferable. If a salesman, for reasons of his own, wants to get rid of a speaker fast, he'll always play it a little louder than the others. It's an old trick of the trade. Don't let him get away with it. Take your time. Hurrying



through a listening test puts heavy odds against your ultimate satisfaction. Relax. Sit down. Make yourself comfortable. Try to pretend that you're at home in your favorite chair. That's the best frame of mind in which to judge loudspeakers.

Once you've made your choice and taken your speakers home, the next question is where to put them. Placement of speakers in your living room vitally affects the quality of the sound you hear. Normally, stereo speakers should be placed at least seven feet apart, the recommended distance between speakers increasing with the size of the room. The speakers should be lined up along the wall opposite your favorite chair. You will obtain richer bass response if the speakers face the full length of the room, because the longer sound throw gives the longer bass wavelength a better chance to spread out in the room. Preferably, the speakers shouldn't face a naked plaster wall or a large window. If they do, you'll get harsh, strident sound. One way of avoiding this is to hang draperies along the wall facing the speakers or to break up the reflecting surface with something like a bookcase.

Greater bass projection results from placing speakers at floor level in the corners. If too much bass results, this can be modified by moving the speakers away from the corners or by raising them to eye level. Most systems, however, tend to be bass-shy rather than the opposite, so that corner placement of the speakers will in most cases give the best results.

Some people don't like to sit directly in the sound projection path of a loudspeaker. They prefer indirect, diffused sound, similar to that normally heard in the balcony seats of a good concert hall. To achieve this effect, point the loudspeakers away from you, bouncing the sound off the walls. You may even turn the speakers on their backs and reflect the sound from the ceiling. By doing this, you are apt to lose a little stereo directionality, but you gain a great deal of sonic spaciousness.

The freedom to suit the speaker placement to the acoustic quirks of your room is one of the great advantages of detached loudspeakers as contrasted to

the speakers built-in to your tape recorder. With a little experimentation you will soon hit on the optimum spot for your speakers. Once you've found it, you'll discover new dimensions of tonal richness and range in your tapes. You'll know why they coined the slogan "Music Sounds Best On Tape."

TAPE AIDS PSYCHIATRY

One of the more ingenious uses for videotape recorders involves the transcontinental interviewing of psychiatric internes by Stanford University's Department of Psychiatry. The brainchild of Dr. James H. Ryan of the Psychiatric Institute of Columbia University, the program involves 75-minute interviews in pleasant surroundings in New York of candidates for jobs at Palo Alto, California. Dr. Ryan asked Stanford's seven-man residency committee to submit questions to him needed in their search for internes. Then, Dr. Ryan interviews each candidate in his home in front of a closed circuit TV camera wired to Columbia's videotape recorder. A week later in Palo Alto, the Stanford committee can meet to watch each candidate as he answers Dr. Ryan's questions.

Dr. Thomas Gonda, chairman of the Stanford committee and associate professor of psychiatry at the university noted that it is important for committee members to observe the candidate as he responds, as well as hearing his answer. He explains that the university receives about ten applications for each residency opening, and noted that thus far the videotaped interviews had proved highly satisfactory. "By using videotape, interviews can be scheduled for the convenience of the busy committee members as a group, or even one or two members at a time," he says. "Either way, TV recording has the potential of presenting committee members the identical interview on which decisions can be made." And since the tapes can be reused, the total cost per interview is estimated at one dollar per hour.



The Basic Tape Library

Broadway Shows

By Michael Uris

In the hundred years or so since the premiere of the spectacular musical, *Black Crook*, an extravaganza with never-before-seen production effects and a chorus of 50 ballet girls, "damning to the soul to see," musical comedy has come practically full circle. The movement has been gradual but definite. What began as a mindless elaboration of the day's melodramas has evolved, by way of operetta, follies, scandals reviews and book musicals into the musical comedy of today. Musical comedy, which seems to have been created as a reaction to an ever-increasing stage realism, has now become the most elaborate exponent of that realism.

From 1866, when *The Black Crook* had its premiere until 1890, the musical theatre was dormant. American audiences were treated to an occasional touring company of Gilbert and Sullivan from England (or pirated American versions put on by enterprising American managers), notably those of *H. M. S. Pinafore* and *The Pirates of Penzance*. But it was not until the gay nineties, spurred by the growth of big business and the rise of the middle class as a social block in the cities, that the musical of the Broadway theatre began to appear. Musical extravaganzas and farces became the order of the day and vaudeville and chautauqua tents popped up everywhere.

An increasing number of musicals paraded across stages during the first decade of this century and the star system began flourishing on Broadway. The great stars of the theatre made appearances both in musicals and in individual vaudeville turns: Weber and Fields, Eddie Foy, David Warfield, Lillian Russell, De Wolfe Hopper and Faye Templeton and the Floradora Sextette were names of the day. They appeared in anything from the extravaganzas *Floradora* and *Fiddle-Dee-Dee* to the incipient book musicals of Victor Herbert. Concerning themselves with young love in elaborate plots and exotic situations, the Herbert operettas bathed youthful attempts at music-book integration in effusions of glowing music.

It was silly, but it was a start.

Even as early as 1903, one fourth of all the shows on Broadway were musical comedy or operetta. Herbert's *Babes in Toyland*, *Mr. Pickwick* and *The Red Mill* were early productions pointing the way toward book musicals.

The next two decades saw little in the serious development of the form but much in the way of elaboration. It was the era of George M. Cohan and Flo Ziegfeld's *Follies*—the height of the extravaganza. All the great stars of the day appeared in the *Ziegfeld Follies*: Cohan, Cantor, Jolson, Marilyn Miller to name only a few. If the *Follies* marked the peak of the extravaganza, it also marked the beginning of its decline.

While the *Follies* were still very much the thing, Sigmund Romberg appeared on the scene. The Romberg operettas seem at first glance to be little more than elaborations of the Victor Herbert type, but they carried Herbert's work a step further. More and more, the book was beginning to determine the profile of the play and fine songs grew out of the plot. The story may have been as silly as ever—operatic and overblown, but this simply reflected a late blooming of the romantic period in America. While student princes and gypsies, Arabs and Berbers may have run through the pages of the operetta, they were beginning to be motivated.

With the 1927 premiere of *Show Boat*, the era of the modern musical really began. Jerome Kern and Oscar Hammerstein II wrote it. As Hammerstein puts it: "It is lucky we became so emotionally involved with Edna Ferber's characters, because love rendered us blind to all the dangers our friends saw in the undertaking. People seemed to go out of their way to discourage us. 'How do you expect to make a musical play out of that?' they would ask. We realized that the story made a number of severe breaks with musical comedy tradition, but that was the very thing that endeared it to us."

It was these breaks with tradition that opened the door to the modern musical. At last we had emotional involvement with characters of more than visceral interest in plots that reflected reality. There were situations that might happen every day. Something had been needed to replace the enhanced glamour of the extravaganza in the public's mind and *Show Boat* was it.

From then on, the musical theatre began the about-face that would eventually bring it back to the reality it was created to counter-act. The characters in *Show Boat* had real problems and real troubles. Thanks to them the characters in all the best musicals that followed it have been drawn

with increasing psychological veracity.

The thirties brought George S. Kaufman, George Abbott, the mature Cole Porter, Vincent Youmans, Irving Berlin. It was the era of the musical of social protest embodied by Marc Blitzstein's *The Cradle Will Rock* at one end of the scale and George Gershwin and Morrie Ryskind's *Of Thee I Sing* at the other. The combination in the latter of musical comedy and topical comment (like that of Will Rogers) was one of the most important advances for the musical theatre, not only in terms of subject matter (political), but in terms of form. *Of Thee I Sing* was made from staple of the musical extravaganza: the pratfall, the topical joke and the music, yet Gershwin and Ryskind (and George S. Kaufman who directed) coalesced these elements into a new and striking form.

Probably the most important contribution to the American musical stage was made by the team of Richard Rodgers and Lorenz Hart, whose *Pal Joey*, while not typical in plot, more clearly typified a trend. *Pal Joey* is the story of a louse, and it proved an American musical could sustain an adult point of view. Joey is a nightclub dancer-gigolo who, after having a go with a rich matron, finally fades off into obscurity, his selfish ambitions unfulfilled.

Pal Joey is a mature, biting and sophisticated work and it showed music and drama could combine to tell such a story.

The nice thing about *Pal Joey* and, indeed, all Rodgers and Hart, is the balance struck between music and drama. The drama never suffers at the hands of the music. Songs grow out of plot effortlessly, and the lyrics always bite, always comment. At the same time, the music itself is satisfying, both as music and as an extension of the plot. This is perhaps the most important achievement of Rodgers and Hart and, to a more erratic extent Rodgers and Hammerstein.

On Your Toes added the dance to these arts. Dancing and ballet were assimilated into the plot of *On Your Toes* so that the heretofore superfluous production number—musical comedy staple—became, as with *Slaughter on Tenth Avenue* an integral part of the story.

During the forties and fifties, the Broadway musical really came into its own, with hits like *Oklahoma*, *South Pacific*, *Guys and Dolls*, *Kiss Me Kate*, *My Fair Lady*, *Brigadoon*, *Wonderful Town*, *West Side Story* and others. For much of this period, the reigning geniuses were Rodgers and Hammerstein, who brought psychiatry to the musical with *Oklahoma's* Pore Jud Fry; and took up the touchy question of racial discrimination in *South Pacific*.

But Rodgers and Hammerstein were by no means the only innovators during the period. Alan Jay Lerner and Frederick Loewe followed the tried and true Broadway formula of picking an exotic locale and time. They tied their music to the setting by turning to folk melodies and themes.



Ezio Pinza and Mary Martin in a scene from Rogers and Hammerstein's musical play of 1949, *South Pacific*.



Jan Clayton and John Raitt seen on the *Carousel*, 1945 Rogers and Hammerstein musical hit from Moluar's *Liliom*.

Paint Your Wagon, a story of the California Gold Rush, drew on music of the period, while their next endeavor, *Brigadoon*, resorted to Scottish tunes and harmonies to tell the story of two Americans who stumble into an enchanted village in the Highlands. And, who can forget the straight-from-the-music hall tunes of Stanley Holloway in *My Fair Lady*?

Frank Loesser scored a smashing success with his musical treatment of Damon Runyon's short stories, *Guys and Dolls*. Loesser, however, envisioned the possibility of a musical which would bridge the gap between Broadway and grand opera. In 1956, he selected Sidney Kingsley's novel, *They Knew What They Wanted*, as a text for a venture which proved more successful artistically than commercially. The show was *The Most Happy Fella*.

The fifties also saw several stage successes by Leonard Bernstein including *West Side Story* and *Candide*. During the decade, another team, that of Sheldon Harnick and Jerry Bock, appeared on the scene with *Fiorello* and *Tenderloin*, while Meredith Wilson earned fame with the *Music Man*.

Broadway is nothing if not responsive to fads. The fifties were the years of the non-singing actor in musical comedy. With the increasing importance of the book, it was felt that actors of greater ability were needed to portray the wider range of emotions being written into the new musicals: Rex Harrison in *My Fair Lady* and Robert Preston in *The Music Man* were particularly congenial examples of such casting, but audiences were not always so fortunate.

To my way of thinking, this trend has been detrimental to musical comedy. For as the importance of the book has increased, it has done so at the expense of the music. Music, which was integrated into the plot by Rodgers and Hart-Hammerstein and others, has more often been submerged by the composers of the sixties.

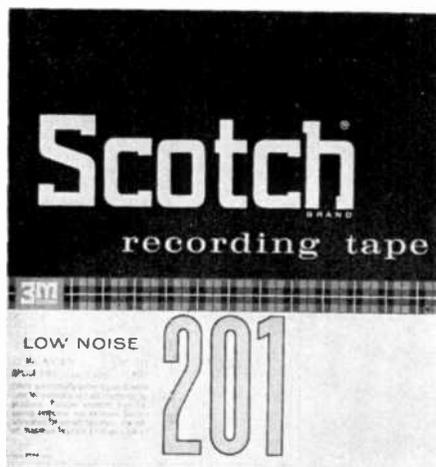
The three reigning hits of the sixties, *How to Succeed in Business Without Really Trying*, *Hello, Dolly* and especially *Fiddler On The Roof* all have what I consider to be mediocre scores. The age of the non-singing actor has bred the age of the non-composing composer all in the name of psychological veracity. But it does not work, for the form fights the content when music exists as a mere utilitarian appendage. The score may now serve an expanded, deepened story, but how often does it comment or make an impression of its own, except on the rare occasion when a Leonard Bernstein writes a *Candide* or a *West Side Story*?

What began as a reaction to realism has, both in plot and form, returned to that realism. But realism unenhanced by insight is literalism and only at its highest points does Broadway rise above such a level. Too often of late, the Broadway musical is merely a hollow echo of a day gone by.

James Lyons
Selects
Broadway Shows

I commend all 10 tapes listed here—and all of the shows on them—to anyone wishing to become familiar with the musical theatre.

1. *Carousel-Soundtrack* — Gordon MacRae & Shirley Jones.
Capitol ZW-694, \$7.98
2. *Finian's Rainbow*—Original 1960 cast—Jeannie Carson, Bill McGuire & Carol Brice
RCA Victor FTO-5003, \$8.98
3. *Funny Girl* — Original Cast — Barbra Streisand, Sidney Chaplin
Capitol ZO-2059, \$8.98
4. *Guys & Dolls*—Frank Sinatra, Bing Crosby, Sammy Davis
Reprise FS-2016, \$7.95
5. *King & I*—Barbara Cook, Anita Darian, Theodore Bikel, Jeanette Scovotti
Columbia OQ-655, \$9.95
6. *My Fair Lady*—Original Cast—Julie Andrews, Rex Harrison
Columbia OQ-310, \$9.95
7. *Oklahoma* — Soundtrack—Gordon MacRae & Shirley Jones
Capitol ZW-595, \$7.98
8. *Showboat* — Soundtrack—John Raitt, Barbara Cook, Wm. Warfield, Anita Darian
Columbia OQ & ROQ-467 (ATR & R3M Cart), \$9.95
9. *South Pacific*—Soundtrack
Victor FTO-5001, \$8.95
10. *West Side Story*—Original Cast —Carol Lawrence, Larry Kert & Chita Rivera
Columbia OQ-345, \$9.95



Scotch 201 low-noise tape is the product of the recording studio. It is designed to reduce tape hiss and improve signal-to-noise ratio at all speeds.



Eastman-Kodak 34A high output tape is sold at standard prices, can be played back at lower levels than other tapes, thus reducing tape hiss.

Five New Tapes: A User's Report

by Robert Angus

There has been a quiet revolution going on within the raw tape industry. Most casual tape users probably haven't noticed these changes, because tape packages have remained pretty much the same. Serious hobbyists may have noticed slightly stronger claims in tape advertising in recent months, but most important, they have probably noticed a distinct improvement in their tapes in regard to background noise and frequency response at tape speeds of 1 7/8 and 3 3/4 ips.

At the same time that manufacturers such as Audio Devices and Eastman Kodak have changed their oxide formulations to improve sound quality, three other manufacturers—Minnesota Mining, Ampex and Sony—have introduced entirely new tapes designed in part to improve slow-speed recording. While not all of these tapes are designed specifically for slow-speed home recording (Scotch #201 is the product of the recording studio, for example), and while their manufacturers don't sell them as exact replacement types for each other, we decided to try each one at slow speed. The tapes we used:

- Ampex 536 slow speed tape is designed specifically to improve high frequency response at slow tape speeds. It is marketed on a variety of mylar bases at standard prices and, according to the manufacturer, is not intended for professional or high fidelity recording at 7 1/2 ips or higher tape speeds.

- Audio Devices B-25 high performance tape is the result of dozens of improvements in tape development during the past 12 years. A company spokesman explains that "it is an evolutionary, rather than a revolutionary product," designed to decrease tape hiss by getting more sound on the tape. It is supplied at standard prices on the usual assortment of reel sizes and bases.

- Eastman Kodak 34A high output tape is similar in many respects to Audio Devices' B-25. It is supplied on Duroil and polyester, at standard prices. Duroil, according to Kodak, is a stronger base material than acetate, and is said to reduce print-through from one tape layer to the next. Like Audio's B-25, Kodak 34A claims high sensitivity and high output, which makes possible playback at much lower levels, thus reducing background tape hiss.

- Scotch #201 low noise tape, as noted above, is the product of the professional recording studio,

where it has been in use for more than a year in making exceptionally quiet recordings. It is being marketed now in the standard reel sizes and bases, at a price premium of about 25 per cent above regular tape prices. It is designed to increase the dynamic range by reducing tape hiss.

- Sony PR-150 recording tape is similar in properties and price to the standard tapes from most American suppliers (it is made in Japan). Sony recommends it for general recording use—not specifically for slow-speed recording.

To provide an index to recording characteristics, tape hiss and other factors, TAPE RECORDING made two test tapes—one, to be recorded at $3\frac{3}{4}$ ips consisting of six-foot strips of each tape type spliced one after another onto a single reel; a second identical tape in which the samples were three feet long for recording at $1\frac{7}{8}$ ips. Before recording on either test tape, we played them through on a Roberts 770 and B & O four-track stereo recorder at top volume. We then recorded sample musical passages on the tapes—quiet orchestral, loud orchestral, string quartet and solo piano—and played them back for several listeners without identifying the tape samples. Then longer recordings were made on complete reels of each brand of tape. It should be noted that Audio Devices and Kodak both recommend recording at a slightly louder than normal setting, and playing back at a quieter level. This procedure was not followed with our sampler tapes, but was when the longer recordings were made. The differences are noted below.

TAPE HISS on all of the tapes we tested has been reduced substantially—although some sound better than others. Scotch's new low noise formulation walks away with top prize. Following close behind—and almost indistinguishable in their low noise characteristics—are Audio, Kodak and Ampex. As noted, when manufacturers' instructions were followed with Audio and Kodak tapes, the hiss level dropped still further, eclipsing Scotch's initial lead. Sony's PR-150 showed somewhat more tape hiss than did any of these others. Interestingly enough, the competition for second place among Kodak, Audio and Ampex was so keen that positions shifted depending on who was doing the sample listening and which recorder was being used.

HIGH FREQUENCY RESPONSE has been boosted noticeably by all five manufacturers. We recorded several types of music plus standard test tones on our test tapes and played them back for the same listeners who had "auditioned" the unrecorded tapes. Recorder controls were set so that needles on the VU meters dipped slightly into the red on loud passages. At $3\frac{3}{4}$ ips, all of our test tapes showed excellent frequency response, virtually indistinguishable from recordings made on standard tapes at $7\frac{1}{2}$ ips. Results at $1\frac{7}{8}$ ips were quite good, although limited in our opinion by the capabilities of the



Sony PR-150, a polyester based tape, comes from Japan. It is similar to American equivalents.



Audiotape-B25 high performance tape is evolutionary rather than revolutionary product.



Ampex 536 is the only one of five tested specifically designed to improve slow-speed recording.

recorder. The tape which most of our listeners found most satisfactory in this category was Ampex 536, followed closely by Audio Devices B-25, Kodak 34-A, Scotch 201 and Sony PR-150, in that order.

LOW FREQUENCY RESPONSE has been improved by some manufacturers. Traditionally, recordings made at $1\frac{7}{8}$ ips have tended to have a boomy, mushy bass. Sony's PR-150 has made substantial improvements in eliminating some of the boom, as have the two high output tapes. The result is a more natural sound. The same problem, in our opinion, does not exist on recordings made at $3\frac{3}{4}$ ips with a good recorder. Here, all five brands showed uniformly good low frequency response.

AUDIBLE DISTORTION was present to some degree on all five of the tapes recorded at $1\frac{7}{8}$ ips. The two most consistent offenders when all were recorded at the same volume level were the two high output tapes, Audio and Kodak. Both tapes produced clearly superior sound, however, when manufacturers' instructions, as noted above, were followed. On our sample test tape, Scotch scored an easy victory, followed by Ampex and Sony. Our $3\frac{3}{4}$ ips test tape was somewhat freer of distortion, although again the high output tapes tended to overload when recorded at the same volume setting as the others. In our opinion, most tape users recording with any of these tapes on a good machine won't notice any difference in distortion between $7\frac{1}{2}$ ips and $3\frac{3}{4}$ ips. Tests on full reels of each tape showed that Scotch, Audio, and Kodak, followed by

Ampex, are best able to handle dramatic dynamic changes and pauses in music.

In spite of the fact that magnetic recording tape has been around for more than two decades, there is no universally-accepted practice for tape testing and standardization. What testing procedures there are generally apply to recordings made at tape speeds of $7\frac{1}{2}$ ips and higher, while in our opinion, more and more users are making recordings at the slower tape speeds. It should be noted here that when recording or playing back at $7\frac{1}{2}$ ips, other tape characteristics are as important or more so than the ones considered here. It should be noted too that many of the properties which make recordings made with these tapes sound so good at slow speeds may make them sound even better at higher tape speeds. Nevertheless, it's our opinion that the combination of one of these new tapes with a quality slow-speed recorder can produce highly acceptable fidelity at $3\frac{3}{4}$ ips—superior to that possible at $7\frac{1}{2}$ ips a very few years ago—and listenable sound at $1\frac{7}{8}$ ips.

Further, the testing procedures commonly in use within the industry measure such factors as tensile strength, retentivity, squareness of the sine wave and other items which, while important to the engineer, have little value for the non-technical recordist who simply wants to know which tape will give him the best sound under his own recording and listening conditions. To determine this, **TAPE RECORDING** has scrapped the normal test procedures and specifications, and tested by recording music from FM and records and test tones from standard test equipment.

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REVIEWS

Verdi

Messa Da Requiem, Lucine Amara, Maureen Forrester, Richard Tucker, George London. The Westminster Choir and the Philadelphia Orchestra, Eugene Ormandy, conductor. Columbia M2Q 656 \$11.95

Music Performance ◆◆◆
Recording ◆◆◆◆

Here is a choral masterpiece that is truly a conductor's score. The Verdi Requiem demands an interpreter of great fire, energy, imagination. Such a man was Toscanini, whose electrifying performance, still available on disc, set the standard for subsequent efforts. Now the Maestro must share the honors. Eugene Ormandy has given us one of the finest Verdi recordings in a decade.

So impassioned is this new reading, so dramatically and spiritually satisfying, that Reiner's Victor performance, in comparison, seems staid and deliberate. But Reiner does have superb soloists, particularly Jussi Bjoerling and Leontyne Price. There is a religious intensity and purity in Miss Price's delivery that Lucine Amara, in spite of her obvious enthusiasm, does not achieve.

The rest of Ormandy's soloists are generally fine. Maureen Forrester's rich deep contralto is perfect. George London is powerful without being majestic. And Richard Tucker's passionate approach has an appropriate Italian flavor. The well-trained chorus sounds inspired from start to finish.

The triumphant star, however, is Ormandy. His strong, dramatic temperament is ideally suited to this unique work. It is true that, occa-

sionally, subtle details are slurred, but Ormandy is building for an overall effect. And he is magnificently successful.

The recording deserves special praise. It is beautifully defined, with rich sonorities and proper attention to the percussive elements in the score. The balances are much better than those in the Reiner recording, and the dynamic range is phenomenal. Listen, for example, as the gigantic "Dies Irae" literally breaks open the heavens. Altogether, an enthralling addition to the tape catalogue.

Rachmaninoff

Piano Concerto No. 2; Rhapsody on a Theme of Paganini, Gary Graffman, piano; New York Philharmonic cond. Bernstein Columbia MQ 657, \$7.95

Music Performance ◆◆◆◆
Recording ◆◆◆◆

Here's one of those recordings which sounds infinitely superior on tape (when compared with the disc version). The reason is the playing time of the Concerto, some 33+ minutes which the engineers managed to squeeze onto a single LP side by tampering slightly with the dynamics and separation. Here we have the recording in its breathtaking original, with first-rate stereo effects. About the performance — suffice it to say that it is Bernstein at his best, with Graffman providing something of a restraining influence upon him. Graffman in the past has tended to be somewhat stiff and wooden; Bernstein, for our taste,

tends to get carried away with romantic fervor every now and again. But here is a happy blending of temperaments. Don't worry about competitive versions—there really aren't any.

Beethoven

Fidelio, Birgit Nilsson, James McCracken, Hermann Prey, Graziella Sciutti Vienna Philharmonic Orch. and Chorus cond. Maazel, London LGS 90085, \$21.95

Music Performance ◆◆◆◆
Recording ◆◆◆◆

If you've been waiting to add a first-rate recording of *Fidelio* to your tape library, you may have to wait a bit longer. This one has an overbearing Florestan, an average conductor and some lightweights in supporting roles. But there's no question about Birgit Nilsson's portrayal of Leonore, which is simultaneously understanding, powerful and heroic. One is tempted to wonder whether the opera couldn't have been squeezed onto a single reel of tape, for as it stands, it has the same number of interruptions as the disc version.

Three Penny Opera

Three Penny Opera, Original Sound Track recording with Sammy Davis, Jr., Martha Schlamme, Jo Wilder and George S. Irving, RCA Victor F105027 \$8.95

Music Performance ◆◆◆
Recording ◆◆◆◆

The adventures of Mack the Knife have finally been brought to the screen with Sammy Davis Jr. as the

Streetsinger. It's a subdued Sammy. Somehow, it's hard to believe this is how Sammy Davis would sing "Mack the Knife" were he given the option of arranging his own material. He sounds most like himself as we prefer him on "How to Survive."

Fans of the musical which had a record engagement in New York for many years and has been on the boards for more than a quarter century in all parts of the world, will probably enjoy this tape. However, for this reviewer, some of the charm of the off-Broadway revival of a few years back has worn off. Even Sammy Davis left me cold—and I'm a Davis fan. My advice is to see the film first, then decide whether or not this is for you.

Dusty Springfield

Dusty Springfield, includes *I Only Want To Be With You, Stay Awhile, 24 Hours From Tulsa, Mama Said, Mocking Bird, etc.* Philips PTC 600133, \$7.95

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

The album notes give no clue to the identity of Dusty Springfield except to indicate she composed one of the 12 songs—"Something Special"—contained herein. Dusty, in fact, was recently named as the best female singer in the United Kingdom by English reviewers. Her fame has also extended to the United States, where her "Wishin' and Hopin'" was voted one of the top 50 hits of the year. What lifts this album from rock and roll banality are the tasteful, imaginative musical scorings. This cannot be said of the voices accompanying Dusty in her bout with material, which at best, is rather tiresome. We suspect by the distortion that some of the voices are Dusty—multiple-taped. The fade-out endings of several selections tends to become monotonous. We hope Dusty gets around to doing an album of straight ballads so her real talents can better be evaluated.

Golden Boy



Golden Boy, Original Broadway Cast with Sammy Davis, Billy Daniels, Paula Wayne and Kenneth Tobey. Capitol Z02124, \$8.95.

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

I had little desire to see "Golden Boy" until I heard this tape. It helped me appreciate the excitement generated by the cast. The music is only slightly above average for a Broadway musical, but serves as an excellent showcase for the numerous talents of Sammy Davis. Stereo directionality is marked on the opening number, "Workout," and is startling in its realism and effectiveness.

The three best numbers, in this reviewer's opinion were the three longest ones. First is a tribute to Harlem, "Don't Forget 127th Street" which is both exciting and amusing and features a virtuoso Davis doing a remarkable impression of Ray Charles. Next is the musically satisfying and popular "This is The Life" featuring Davis and Billy Daniels. On side two, the 6½ minute "No More" transforms itself into a beautiful spiritual with a beat. It's excellent.

The orchestra conducted by Elliot Lawrence deserves special commendation for an outstanding performance.

Roger Miller

Roger Miller, includes *Dang Me, Chug-A-Lug, The Moon is High, Private John Q, Lou's Got the Flu, etc.* Smash STC67049, \$7.95

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

Roger Miller, ex-Oklahoman gone Nashville, belts out the 12 songs here in a style that is actually a group of styles, ranging from straight Western, through imitative, to burlesque. The material is entirely his own. "Dang Me" and "Chug-A-Lug" have already hit the top 100 hits of 1964 category. Roger has a tendency to use vocal "tricks," but instinctively drops them at the right point in a given selection to prevent the tricks from dominating. The recording can best be called spacious, a trifle on the echoey side, typical of cuttings made in a large hall. Excellent guitar work and a steady beat put this album in the "go buy it" category for those who like Nashville-pop material.

Ben Franklin in Paris

Ben Franklin in Paris, Original Broadway Cast stars Robert Preston, with Ulla Sallert and Susan Watson. Capitol Z02191, \$8.95.

Music	◆
Performance	◆◆
Recording	◆◆◆◆

By any possible standard that it may be judged, *Ben Franklin in Paris* to this reviewer is an utter failure. It is a repository for the most mediocre music and banal lyrics that have plagued Broadway for some time. And in Robert Preston, it has a star of the greatest charm and warmth who is allowed to display none of the qualities that might pluck the show out of its infinite doldrum.

The principal failure of author Sidney Michaels is that he has created neither a situation of any interest nor, in Ben Franklin, a character

of any but the most elementary drives. To be blunt, this Ben Franklin is a crashing bore and comes across like a dirty old man.

In Mark Sandrich, Jr., Michaels has found a collaborator to complement his own talent. Sandrich has composed music of such unendurable mediocrity that the mind boggles even at this late date. He goes through all the motions and makes all the noises that musical comedy composers should make, but march runs into ballad into chorus in a veritable textbook of what's wrong with musical comedy today. *Ben Franklin in Paris* is a paste-up job put together to pander to a pre-formed audience a formula that has been known to sell. It is all kind of incestuous.

Technically, the tape is excellent. Capitol having done its job with greater skill than the authors. Hohum.

The Brothers Four

The Big Folk Hits and More The Big Folk Hits, *The Brothers Four*, includes *Where Have All the Flowers Gone*, *Muleskinner*, *San Francisco Bay Blues*, *Scarlet Ribbons*, *Jamaica Farewell*, *If I Had a Hammer*, *Tie Me Kangaroo Down Sport*, *Walk Right In*, *We Shall Overcome*, *Michael Row the Boat Ashore* and 14 others, Columbia C20702. \$11.95

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

"Smooth" is a fitting one-word description for the hugely popular Brothers Four. A high degree of professionalism and consistency marks each performance by this group. Here we find no exception.

On this two-album tape are many of the most popular folk hits of the past few seasons. The material is varied in pace but, in spite of this, the Brothers Four begin to project a certain "sameness" after prolonged listening. It is suggested that the listener take a breather between sides one and two. Of the two sides, this reviewer preferred side one for both performance and variety.

Joan Baez

Joan Baez #5, includes: *Stewball*; *It Ain't Me Babe*; *The Death of Queen Jane*; *Bachianas Brasileiras No. 5*; *Go 'Way From My Window*; *The Unquiet Grave*; etc. Vanguard VTC 1696, \$7.95

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

This may best be described as a showcase for Joan Baez. The material runs the gamut from country & western and contemporary folk-pop to classical British balladry and aria; and the superbly lyrical Baez voice comes through with flying colors. The one jarring note is the excessive squeaking from the left hand sliding of the guitar strings in "It Ain't Me Babe," almost ruining an otherwise fine rendition. Fortunately, this one disturbing element is only a minor distraction in what is overall an outstanding performance.

Andre Previn



My Fair Lady, Andre Previn and his Quartet, includes *You Did It*, *The Rain in Spain*, *Without You*, *I Could Have Danced All Night*, *On the Street Where You Live*, *With a Little Bit of Luck*, *I've Grown Accustomed To Her Face*, *I'm an Ordinary Man*.

Wouldn't It Be Lovely, Get Me to the Church On Time, Columbia CQ-705 \$7.95.

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

This is a four-star tape in every category. The music is superb. Previn's arrangements show an appreciation not only for the beauty of the score but for its inherent wit.

This is Previn's second jazz interpretation of the smash musical. His first appeared almost nine years ago. This version was undertaken after Previn had completed his assignment as musical director of the recent Warner Brothers film production of the Broadway musical. The tape includes several songs which Previn had not recorded previously and new interpretations of duplicated numbers. This second album has benefited from Previn's greater familiarity with the score, his own growth as a composer-arranger-performer and, particularly, from his sophistication.

Even those who profess a disdain for jazz are likely to enjoy this tape. Previn hews closely to the original melodies and his musicianship is superb. The trio backing his piano never obtrudes. This tape is highly recommended.

Ian and Sylvia

Ian and Sylvia—Northern Journey, includes: *Little Beggaman*; *Texas Rangers*; *The Ghost Lover*; *Captain Woodstock's Courtship*; *The Jealous Lover*; *Brave Wolfe*; *Nova Scotia Farewell*; etc. Vanguard VTC 1695, \$7.95

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

The word is that Canada is experiencing a folk music revival that at least equals, if not surpasses our own. With the likes of Ian and Sylvia for inspiration, this is not difficult to understand. Few duos on either side of the border can match them for their fresh and enthusiastic approach, their spirit, and their versatility. The songs equally represent Canadian, British, and United States tradition, but most are Canadian

versions. The instrumental work, although tending to stress a heavy guitar beat, is more than competent and generally not too obtrusive. A highly recommended collection.

The Animals

The Animals, includes *House of the Rising Sun, Around and Around, I'm In Love Again, I'm Mad Again, I've Been Around, etc.* **MGM STC-4264, \$7.95**

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

One of several Beatle-Inspired groups from England, The Animals have done right well in the United States, landing among the top 50 tunes of 1964 with their compelling "House of the Rising Sun." Especially effective is John Lee Hooker's "I'm Mad Again," with a strong insinuating accompaniment featuring guitar and organ, well voiced. The organ provides a driving beat in "Blue Feeling" and "Baby Let Me Take You Home." Except for a few lapses into typical rock and roll delivery, the group achieves a quite authentic rhythm and blues sound in this collection. The recording has excellent "presence."

Chad Mitchell Trio

The Chad Mitchell Trio—Reflecting, includes: *Barry's Boys; The Virgin Mary; The Tarriers Song; Queen Elinor's Confession; Stewball; The Sinking Of the Reuben James; etc.* **Mercury STC 60891, \$7.95**

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

One of the best of the current crop of folk-pops groups in what is perhaps their finest performance to date. Within the overall mood of reflection and thought, there is something for almost every taste, ranging from the sharp, undiluted wit of "Barry's Boys" to the quiet reflectiveness of

"In the Summer of His Years." Paul Prestopino and his colleagues also rate a nod for their first-rate instrumental accompaniments. Finally, a word to Marv David, the compiler of the liner notes—"Queen Elinor's Confession" is no more Elizabethan, either in time or mood, than is "The Sinking Of the Reuben James."

Johnny Cash

I Walk the Line and Ring of Fire, Johnny Cash, includes *I Walk the Line, Ring of Fire, Tennessee Flat-Top Box, I'd Still Be There, Goodbye Little Darlin', Goodbye and 18 others.* **Columbia C20703, \$11.95.**

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

Only recently has Country and Western music achieved a status similar to other, more popular forms of what-we now consider folk music. One of the most popular country balladeers was Johnny Cash who won recognition for both his singing and composing. Generally recognized as one of the best songwriting talents in his field since the legendary Hank Williams, Cash presented on both albums comprising this tape, a large collection of his own material. Two of the best items are two of his best known: "I Walk the Line" and "Ring of Fire."

Cash showed unique imagination in several of his arrangements on this tape, particularly Ring of Fire, in which he captured the feeling of a Mariachi band with the background accompaniment of Mexican trumpets. His wry humor is much in evidence in "Bad News," "Give My Love to Rose" and "I'd Still Be There." One cannot help but feel "Tennessee Flat-Top Box" is autobiographical. For Country and Western fans, this tape is recommended.

Barbra Streisand

People, Barbra Streisand, includes, *Absent Minded Me, When in Rome, Fine and Dandy, Supper Time, Will*

He Like Me, How Does The Wine Taste, I'm All Smiles, Autumn, My Lord and Master, Love is a Bore, Don't like Goodbyes, People. **Columbia CQ686, \$7.95.**

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

The selections in this tape seem particularly suited to the Streisand talent. The opening "Absent Minded Me" followed by "When In Rome" are Streisand at her best, which is very good, indeed. The stereo effect on "How Does the Wine Taste?" is both subtle and arresting.

The opener on the reverse, "I'm All Smiles" has just the right mood and pace for Streisand. One is tempted to speculate that Miss Streisand selected these numbers herself because they suit her own musical tastes while providing a showcase for her talent as well. A perfect example is the closing "People." It has been recorded by many others since being introduced by Miss Streisand in "Funny Girl," but it remains her song. So it is with most numbers on the tape. Barbra's performance tops almost any others we've heard.

Serendipity Singers

The Many Sides of the Serendipity Singers, includes: *You Don't Know; Movin' In My Heart; Six Foot Six; Hi-Lili-Hi-Lo; Fast Freight; Let Me Fly; Beans In My Ears; New Frankie and Johnny Song; etc.* **Phillips PTC 600134, \$7.95**

Music	◆◆
Performance	◆◆
Recording	◆◆◆

This is essentially a one-song release. The Serendipity Singers appear to have that happy faculty—so necessary to the continued existence of such groups—of coming up regularly with a hit item, in this instance "Beans In My Ears." Other than this, the collection has little to commend it. Although "Hi-Lili-Hi-Lo" and "The New Frankie and Johnny Song" are a notch above the rest, there is a sameness of sound which tends either to induce a state of drowsiness in the listener or lead him to wonder when the tape will end.

Stereo Microphone Techniques

by John Milder

If you have yet to take the plunge into live stereo taping, you may be in for a bit of a surprise when you finally get around to it. Instead of making extra demands on the expertise of the amateur recording engineer, stereo actually makes matters easier and less critical. And the extra paraphernalia you need doesn't get in the way.

In general, even a poorly placed pair of stereo mikes can yield an intelligible recording—more intelligible in some cases than a carefully calculated mono tape. In stereo, the so-called precedence effect allows the listener to single out a voice or an instrumental line that would be obscured or totally lost in mono. Equally important, the use of a second mike—seldom employed by a non-professional for a mono recording—encourages a sonic balance not easily achieved with a single mike.

If even a casually arranged and poorly mixed stereo tape can sound surprisingly good, a little effort and experimentation can produce a stereo recording that's a thing of beauty and a joy forever. While it may not be possible to outdo the efforts of professional recording engineers your first, second, or hundredth time out, it definitely is possible to come up with tapes that are a pleasure to hear over and over again in your living room. And only a few basic techniques need mastering to achieve this objective.

Probably the most important idea to keep in mind at all times is that recording, like photography, is a highly artificial process. Just as camera lenses don't see in the same way the eyes do, microphones don't operate in the exact fashion of human ears. It takes some deliberate distortion of what would seem to be a normal perspective to come up with a recording that really sounds natural. You may have to spot a microphone a few inches from a subject to make the final tape sound as if it were recorded a few feet away. You may have to go to great pains to blot out the background distractions that your own ears automatically ignore. In this latter respect, stereo is far easier to work in than mono, since it helps to distinguish between foreground and background material. It's still important



to remember that such distractions as footsteps in the next room, a car passing outside the window, or a member of a living-room audience whispering a comment will sound much more prominent on tape than in their natural state.

One thing worth keeping in mind from the outset is that desired detail is lost as easily in recording as in photography. If you try to photograph a high school graduating class by backing away until you can get everyone in the picture, you wind up with an indistinct jumble in which caps and gowns could just as easily be flapper outfits. If you back off with a pair of microphones so that you'll have a nice, even shot of everyone in a chorus, the finished tape could be of a barber shop quartet in a cavern. Be prepared, then, to work reasonably close to your subject at almost all times—particularly since even a pair of stereo mikes can't focus in the same way a camera can.

Assuming for the moment that you don't intend to emulate the professional engineer with his special-purpose equipment, and that you intend to use your recorder pretty much as is, the chances are that the original-equipment microphones that came with your recorder are omnidirectional in their pickup pattern. If so, you will have to take care to avoid muddy sound on the finished tape. Ominidirectional mikes are prone to pick up the equally omnidirectional mid-bass frequencies that bounce around a room, which can make for an extremely soggy recording. Needless to say, they are also extremely efficient at coming up with background noise in any room. You must, then, work *very* close to your subject with standard omnidirectional mikes.

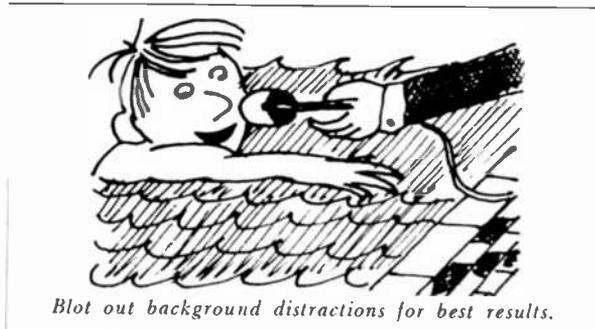


Spot a microphone a few inches from subject.

When recording a group, do as much rearranging of its members as you have to to give all the members reasonably equal access to the mikes, but don't move the mikes themselves very far back to get everyone in the picture. And if the room you're taping in has good acoustics, don't worry that you'll lose the room's sound by recording close-in: even when your mikes are six inches or so from a performer, the sound of the room will make itself felt on tape.

Even if your recorder came with relatively good dynamic mikes of its own, you may want to pay a slight premium for more flexibility. The idea here

is to supplement the standard omnidirectional dynamic with other types. A good first addition is a cardioid (unidirectional) mike to spotlight a performer or deal with a situation where a good amount of extraneous noise from various directions has to be eliminated. There was a time when an inexpensive cardioid for the non-professional engineer was considered impossible to make, but plenty of satisfactory entries are now available. Another possibility, often very useful, is the bi-directional ribbon microphone, which picks up sound in a



Blot out background distractions for best results.

figure-eight pattern to front and back. This can be a real boon for getting performers in the picture (on both sides of the mike) without moving too far away from them. It can also, through the gradual lessening of its sensitivity to the sides, help to tone down an instrument that keeps asserting itself too forcefully on tape.

Should you decide definitely to branch out with extra mikes, a mike mixer eventually becomes inevitable. Fortunately, transistors have reduced the cost of good mixers to a very reasonable level, and you now can emulate the flexibility of the engineer's control-room console for less than \$50.

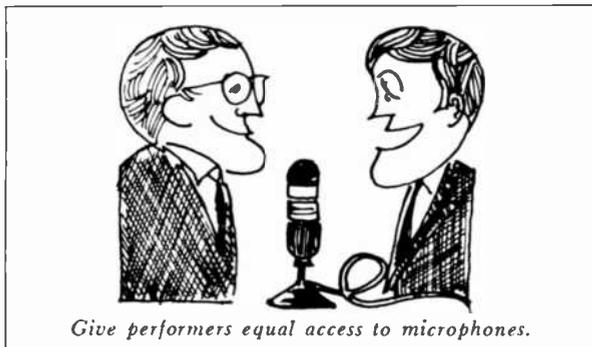
When settling down to make any kind of tape, whether of your local community chorus singing Bach or of your grandfather telling Spanish-American War stories, try to do some monitoring before the festivities actually begin. You'll get a more accurate idea of a recording's perspective if you listen over your recorder's or audio system's speakers than if you use headphones, but the latter usually are necessary either to blot out the on-the-scene noise that would distract your judgment or to blot out the sound of the recorder that would distract the performers before or during the actual recording session. When monitoring over a headset, keep in mind that the stereo image appears far more dramatic than it does during ultimate playback over a set of speakers. Room reverberation also is exaggerated over headphones. You need not worry about the reverb itself unless it asserts itself at the expense of the performers' intelligibility, but you should very definitely worry about getting *maximum* definition of the performers themselves and a *minimum* contribution from the room. (When you actually clamp on a pair of headphones, you will find this last

suggestion is not as esoteric as it sounds).

Whenever a singer's or instrumentalist's loudest notes cause overmodulation or shatter, check to see whether the right remedy is lowering the recording level or moving a microphone back a few inches. This may be the trickiest judgment you have to make during a recording session, and if you begin to go a bit dotty trying to find the right mike replacement and tape level for a leather-lunged soprano, it may help to realize that professional engineers often have just as much trouble. Patience!

Assuming that you've had no trouble in setting recording level, however, let's check the final precautions to take before a session gets under way. At this point, your main concern should be to track down and eliminate the most serious sources of extraneous noise. An easy first step is to make sure that your recorder itself is far enough away from your mikes to avoid pickup of its mechanical noise. Then look and listen—carefully—for other sources such as open windows and doors that let the sound of the outside world come in, mike locations that pick up sonic explosions when someone walks across the floor, and such possibly unpredictable noise-makers as a family dog.

Here, too, perfection is unlikely. Without the professional engineer's mike booms or guy wires, you won't be able to get rid of every floor-borne thump. And it's not often possible to keep all evidence of the outside world off your tape. But you



can take whatever practical measures are within your capability. (In my own last recording session, in a onetime-barn-now-guesthouse, I wound up suspending my microphones via their own cables from rusty nails hastily hammered—with a friend's boot—into an overhead beam. The results were just fine, thank you).

With a little bit of luck, and the help of stereo-phony itself, you can make consistently good recordings with only the few basics outlined so far. But if you're interested either in shaming the professionals or just in using your tape machine on location as often and successfully as possible, you'll need the help of a bit of gadgetry.

If taping in public or semi-public places is one of your main objectives, there are a couple of simple but important things you can do. The first

is to go out and buy about 100 feet of AC line cord to take along. One of the consistent irritations of taping in grade school auditoriums, high school gyms, churches, and you-name-it is that there is *never* a convenient AC wall socket. You'll have to go looking, with your own electrical cord. And when taping public performances in any of these locales, chances are that you'll have to make yourself and your recorder inconspicuous. This means long mike cables and a remote location for your tape machine. To make this possible, you'll almost certainly have to have the inputs of your recorder converted to low-impedance by means of input transformers, the only way to permit long cable runs without losses in high frequencies and/or volume. This in turn means that your mikes themselves must be low-impedance.

All of which helps us sneak up on an important matter: the replacement or reinforcement of the original-equipment mikes that came with your recorder. If your machine was provided with ceramic mikes, you can almost invariably improve your recordings with a pair of relatively inexpensive dynamics. This may require the use of a mike preamp in some instances to make up for lost output, but again the cost can be minimal. What you can hope to gain in most cases is significantly smoother and wider-range sound.

However ambitious you become, the key to successful taping will remain experimentation with mike placement. This is the main preoccupation of the professional engineer—and an important enough matter to keep high-priced performers in studios around the world cooling their heels until it has been done to everyone's satisfaction. And if *they* can do it, so can you.

Tape To The Rescue

Magnetic tape has taken some of the work out of looking for the right college for students at Rutherford (New Jersey) High School. Assistant principal Dr. A. Martin Bloom has compiled recorded interviews with the directors of admissions of some 35 colleges and universities along the East Coast—and the tapes are available at any time during the school year to students or parents. Dr. Bloom notes that the tapes cover such frequently asked questions as the background and location of the college, its plans for expansion, the curriculum and majors offered, residence and eating facilities, details on athletics and social life, how to apply, requirements for admission, financial assistance and job placement programs. Most colleges contacted by the school have gone along with the taped interviews, Dr. Bloom said, although some prefer parents to visit the campus to obtain such information.

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SUMMARY

The VKR 500 is a simple Video and Audio recorder recording both sound and television signal simultaneously on two tracks on 1/4" (6.0350 mm) magnetic tape. The two tracks occupy one half of the width of the tape consequently the other half of the tape may be recorded in the opposite direction. The magnetic recording tape moves at constant velocity past the fixed Video and Audio recording heads as in a normal audio recorder. The tape velocity may be selected by the user at 7.5, 10, or 12.5 feet per second.

The video track records the video spectrum up to 2 megacycles and is 70 mils wide and is placed on the outside edge of the tape. Between the inside edge of the video track and the center of the tape is the sound track, which is recorded on an FM carrier and is 20 mils in width. The system of vision recording utilized is direct recording of a pre-distorted video wave-form with a unique system of sync recovery in the replay model.

PURPOSE OF RECORDER

The VKR 500 was designed to meet the requirement for an Audio visual recorder with a medium specification for use in laboratory recording of CCTV signals, industrial CCTV systems, educational applications where the budget is restricted, and finally for a whole range of amateur applications. The most important being for direct replay home movies using a small I.T.V. camera and for the direct recording of T.V. shows off the air.

TECHNICAL DESCRIPTION

Record Function

The VKR 500 is a machine which operates in the direct mode. The magnetic flux density at any point along the recorded track corresponds to the magnitude of the video wave-form at that point. The tape is pre-magnetized in one direction with a permanent magnet before recording. This erases from the tape any previous recordings, but also has the effect that any further magnetization of the tape during recording must be relative to this point which is not in the linear section of the tape. Therefore the recording signal feed to the head must include some form of bias which in this case is a direct current. The synchronizing pulses are not fed into the recording head in their original form, but are differentiated, having an important effect on the design of the replay amplifier and sync recovery system.

The video signal is fed to the recording head from a special head driver unit which contains the driver transistor and certain critical inductive components which pre-distort the video signal. In the VKR 500 this unit is supplied complete tested and potted to ensure a constant standard of performance from unit to unit. The sound record section consists of a frequency modulated multivibrator which drives a conventionally designed sound head.

MECHANICAL

Extreme simplicity of design has been aimed at allowing the same expenditure on the more critical parts as one would expect on very expensive equipment. The layout of the transport is conventional, the tape leaving the take-off spool through a tension device, passing over the erase magnet and on past the sound and vision heads to the capstan and then to the take-up reel. The flywheel and capstan are belt driven by a 1/10 H.P. motor and the capstan is interchangeable for different speeds. Two function switches are mounted on the deck plate, one operating the pinch wheel motor switch and brake, the other being the record playback switch, which is mechanically linked to the printed circuit switches. The record playback switch has the erase magnet fitted, thus making the change over automatic. The assembly of the transport can be undertaken with simple tools and with confidence by the average technician.

CONNECTION TO T.V. SET OR MONITOR

The necessary modification of a standard domestic T.V. is easily carried out; the signal for recording being taken from the video detector and fed back into the grid of the video output stage. Full information for this modification being supplied in the manual. The audio signal is derived from the loudspeaker and fed back to the grid of the first L.F. stage. In the case of a video monitor being used with the recorder, the normal monitor input of 1 volt pp may be used. The output from a normal I.T.V. camera chain will feed direct into the record amplifier input.

REPLAY FUNCTION

The same head is used for record and replay both in the sound and vision sections. In the vision section the signal from the head passes into the replay pre-amplifier, which again is a factory tested potted unit. This is found necessary to ensure consistency of gain and signal to noise ratio from unit to unit. In the main replay section the differentiated signal from the pre-amplifier is fed into an integrator stage with a non linear input circuit which has an important effect in tilt correction and on to a number of stages of amplification with a critical low frequency cut feature. After sync re-insertion the output is fed into the T.V. receiver or monitor.

The synchronizing signal is recovered separately in an unusual 4 stage regenerator where the vertical pulse is recovered by a pulse counting technique, the sync pulses are now re-inserted in a combined clamp and gate circuit. In the sound replay section the sound signal from the head passes through a four stage amplifier and limiter to a diode pump de modulator and out to the reproducing compensating stage.

ELECTRONIC CONSTRUCTION

The entire electronics with the exception of the mains transformer and smoothing capacitor is constructed on a single printed circuit board, thus all the necessary switch connections are printed.

There are only the four head connections and eight other signal and power connections to make, all other interconnections being printed. The system is of course entirely transistorized employing 22 silicon transistors, 2 germanium transistors and 6 diodes. The single printed circuit board is mounted solidly on the main recorder deck.

EXTERNAL

Size 20" x 10.7" x 7.7"

Weight 28 lbs.

Mains Supply: 200-240 volts 50 cycles A.C. 109-117 volts 60 cycles A.C.

Maximum Power Consumption 200 watts.

SPECIFICATION VIDEO

Speeds—7.5, 10.0, 12.5 ft per second

Recorded Spectrum—2 Mcs. to 1 Kcs.

System Direct Recording with N.I.S.R.

Running Time—30 mins per side maximum at 7.5 ft. sec.

Spool Size—11 1/2" maximum

Tracking—2 Sound, 2 Vision.

Input—1 volt D.A.P. Vision.

Output—4 volts D.A.P. Vision.

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The Future of Home Videotape

Home video has burst upon the scene much faster than most of the experts believed possible. It now seems we may not have to wait much longer.

To get some idea of home videotape's impact, TAPE RECORDING contacted a number of leaders in the arts, in broadcasting, in education and in tape recording. Their statements, which appear on the next few pages, reflect dramatically just what home videotape can mean to you.

American Broadcasting Co.

The advent of home videotape recorders should be a step forward in the development of television. When mass production and marketing bring it within reach of the average viewer, the pleasure and usefulness of a television set will be greatly increased. The viewer will be able to watch his favorite television program when it is most convenient. He will be able to build a tape library of the best the networks and independent stations have to offer, and perhaps to buy or rent commercially taped sports or theatrical presentations.

Douglas Edwards

CBS News Commentator

Home videotape recording libraries will be bigger one day than all tape and record collections—if cost comes down. And it should. The possibilities for color recordings are enormous. The prices will be high, of course, but they will come down, as did the prices of television sets through research and mass production.

The recorder will be the answer to having to make choices of television programs. You just won't have to make them. With three major networks, no one can watch all three at once. You can't even watch two programs by channel switching satisfactorily. But you can watch one and attach your recorder to another set. If you're going to be away, for example, you could set up the recorder for your favorite program. Later you could play the program back at leisure.

Oh, yes, I would have a home videotape recorder. It's a marvelous educational item, a splendid idea. For example, you could have taped all of the documentaries on Churchill and preserved them for your children. Historically significant tapes would be a magnificent thing to have. As a research instrument, the spoken word could be used as the written word is now used. When the home videotape recorder is fully developed, it will provide a great plateau from which we can go on.

Jack Gould

Television Critic, New York Times

I confess to being puzzled about the present status of home video tape recording. There seems to be a good bit of confusion about just how advanced it is. . . .

Milton Shapp

President, Jerrold Electronics

A TV set is a lot like a hi fi amplifier, except that it produces pictures as well as sound. Now, a hi fi amplifier can be used with quite a variety of program sources, including radio tuners, record players, tape recorders and microphones.

It would be rather foolish to say that the use of hi fi amplifiers must be restricted to reproduction of radio broadcasts. By the same token, it is foolish to insist that reception of TV broadcasts is the only use to which you should put a TV set.

There are just as many possible inputs to a TV set as there are to a hi fi amplifier. I predict that TV sets will soon be used extensively with home TV cameras as well as home videotape recorders. Like their audio counterparts, videotape recorders will be used to record broadcast program material. But they will also be used to record "home movie" type programs. Just as we presently use microphones with our audio tape recorders, we will someday use TV cameras with our video tape recorders.

Pre-recorded video tapes will also play a big role

in our home entertainment. People will buy or rent tapes as they do records. This is a practical way in which people willing to pay for unusual or different TV programs can get them.

Let's not overlook the educational value of television, either. TV is being used more and more as a visual aid in our schools. The low priced videotape recorder will prove to be an especially versatile teaching tool.

A TV set is essentially a cathode ray tube capable of reproducing pictures and a speaker capable of reproducing sound. When looked at in this light, it becomes a very exciting center of home entertainment. According to TV Guide, 93.5 per cent of US homes own TV sets, which occupy fully 70 per cent of their leisure time. It is unquestionably true home videotape recorders will go a long way toward making those viewing hours more rewarding.

John Cushman

Federal Communications Commission

The FCC is interested in home videotape recording development from an engineer's viewpoint. Our engineers know what is going on but it is a matter of interest, of keeping informed, rather than of jurisdiction. The FCC has no jurisdiction over the private person, and there has been no special research by the FCC concerning property rights versus the private person.

It is likely that no further legislation would be needed to govern home videotape recording. There is already provision for home tape recording of programs broadcast over the air. In general, the tape recording enthusiast has nothing to fear unless he gets into the position of trying to use recordings for profit.

Judith Crist

Film Critic, N. Y. Herald Tribune

One of the flaws of television is, of course, its transitory nature. Once a live or even taped program is missed it is *gone*. Capturing the sight as well as the sound of news, special events and public affairs programs can be of vast educational value. One can not only see history in the making but preserve it.

Further, so many of the best programs and of our major news-feature or special programs are presented at hours that preclude students', working people's or early-to-bedders' seeing them that a record device is invaluable. How a teacher could have used day-after tapes of the early-morning or late-at-night Churchill tributes, for example! And consider the individual's ability to share with others a particular program he alone happened to "catch." And of

course for sheer entertainment—well.

The only non-winner I feel will be the movie buff who would want to take television-revivals off the screen, instead of renting or buying his own 16 mm. prints of what's available. The way television butchers old movies to provide time for commercials is deplorable. On the other hand, perhaps by the time videotape recorders are in wide use, television stations will have become a bit more responsible.

We're talking purely speculatively, of course, but I think the cost of videotapes of theatrical or educational films (now available, of course, on a rental or sale basis to owners of home projectors), of stage plays (and I don't think Theatrovision indicates that *plays*, rather than performances, can be recorded in action) or "educational programs" will predicate their popularity. It will still depend on whether the producers permit such reproductions.

I therefore think the major value will be in preserving television offerings—and suspect that use of videotape recorders could well signal the doom of pay-television—infanticide though it would be.

Leonard Burkat

Vice President, Columbia Records

Videotapes, recorders and playback equipment are so far as I know still far beyond the reach of the average American consumer. If they come somewhat closer in the near future, it will then be possible to gauge their potential social, cultural and economic effects.

Robert O'Brien

Caedmon Records

The home videotape recorder won't stimulate drama on television. There aren't enough people willing to watch it now. How many viewers would there be to tape television dramas?

John Ciardi

Critic, The Saturday Review

I don't know anything about videotape recorders, but I'll tell you this: last May our television set went out of commission and we threw the blessed thing out. We started to talk to each other again at my house, and it was the best thing we ever did for family life. Now I don't have to go up to the attic to read.

I have faith in educational television and if something serious, such as "Three Days in November" came on, we'd go out and get a set. But despite the good work on educational television, I've never turned on the set with the intent to improve my mind.

Robert Margulies

Vice-President, Ted Bates, Advertising

There is no doubt in my mind that videotape machines in the home will come. Just as we have high fidelity record players in the home, just as we have high fidelity soundtape at home, so we will have videotape at home. Some day I am sure I will be able to walk into a videotape store and buy the complete world series, the complete opera Carmen, certain types of feature motion pictures, cartoons for my children, cooking shows for my wife, etc., etc., etc.

I do not believe, however, that the advent of home videotape will substantially harm the motion picture business as we know it, commercial television as we know it or live entertainment as we know it. I believe the separate industries will so be regulated and will so regulate themselves so as not to do away with each other. Home videotape will be accepted as part of our everyday life as the radio was and as television is. Momentarily, of course, any given industry can suffer as happened when television first came into our homes. We still have legitimate theatre, live concerts, museums and galleries, sports events, etc.

As the American economy progresses, we find ourselves with more and more leisure time. Videotape in the home with all other forms of entertainment will help to fill this time.

C. I. Alden

Mag. Prod. Div., 3M Co.

A bright, new round of business growth is inevitable with the development and possible introduction this year of video tape recording and playback units inexpensive enough for the American home.

As a manufacturer of magnetic recording tapes of all kinds, we are tremendously interested in this whole, fascinating concept. 3M Company introduced video tape to the world under its "Scotch" brand name in 1956 and has since then been a major supplier. As a matter of fact, many of the sound tape and video tape recorders that have been built over the years were designed to take advantage of 3M tape. That is still the case with some of the new recorders that are being developed and refined.

Several companies, including Sony, Telcan, Fairchild, Par Ltd., Loewe-Opta and Philips of Eindhoven, The Netherlands, have already demonstrated prototypes of relatively inexpensive video tape units. They have shown surprisingly good results. One of the established companies has a model at about \$30,000. Several others have models at between \$10,000 and \$15,000 but the companies we're talking

about, if their plans come true, intend to market the so-called home video tape recorders at prices somewhere between \$300 and \$3,000.

Our greatest interest has been to produce quality tape for all the machine manufacturers so that, first, they would have the materials with which to carry out the necessary research and refinement and, second, so they can assure buyers of a reliable source for their future tape needs.

While the better video tape systems will find their immediate market in the educational and industrial fields, in athletic coaching and newsgathering, much of the ultimate use will be in the home. The systems will be used to record and play back television programs, to monitor nurseries or yard play, to capture special family gatherings and to record and play back the sights and sounds of our children as they grow.

The day is not far off when we'll be able to rent or borrow from tape libraries full-length features, entertaining comedies, magnificent musicals, great orchestras in stereo sound and see the best Broadway plays with their original casts. We'll see the major dramas and documentaries of the world, eventually in color, on video tape played back through these units that are being developed for our own living rooms.

Because of this new and greater concept, business growth is inevitable. There will be growth in the theater and in fields that support the theater, growth in the recording business, in sales of pre-recorded tape productions, in the manufacture of home camera systems and light industrial cameras, in the electronics manufacturing fields as well as in the manufacture of the recording and playback machines and the video tape itself.

As people all over the world take to this new concept of entertainment in the home, it will spark the biggest new consumer business since television itself.

OUR NEXT ISSUE

The June issue of **TAPE RECORDING** will be devoted entirely to tape out of doors and summertime recording fun. Look for these features:

- **Tape in Your Car**—A report on the car tape cartridge players.
- **Music for Summertime Listening**—A guide to help you plan your summer listening.
- **Tape Your Vacation**—The Hows and Whys of sound snapshots.
- **Tape in the Back Yard**—Some pointers on taking tape out of doors.
- **Tape Goes to the Beach**—A rundown on battery portables suitable for providing music at the beach, on picnics, or just about anywhere you decide to go this summer.

Erases an entire reel
in seconds!



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tape

CLINIC

I'm still not convinced of the advantages of transistors in recorders which are intended to be used primarily in the home. What do you think of them?

Thomas B. Norman
Alexandria, Va.

Transistors are used in large portable recorders for a variety of reasons—among them elimination of unwanted heat, reduction in size and weight, possible reduction of hum level by eliminating output transformers and the promise of greater reliability. We say "promise" because at present, most of the better tube units are just as reliable as the good transistor models. Heat, however, is a problem with tubes, particularly in compact recorders. At present, in our opinion, other factors—such as features, value for the money, etc.—are more important in considering a recorder than whether it's made with tubes or transistors.

I had always understood that the VU meter was the best type of volume indicator on a tape recorder. Now I discover that some of the more expensive machines like the Ampex use other types. Which type is best?

John B. Crain
Drexel Hill, Pa.

Whatever the type of volume indicator used on a recorder, its chief virtue should be accuracy. Some types of VU meters are less accurate than others—and are less accurate than some of the better cat's eyes and neon tubes currently in use. Accuracy frequently is a factor of price—that is, the VU meters used on the more expensive machines are inclined to be more reliable than those on less expensive models. A second virtue should be readability. Some non-professionals find cat's

eyes or neon tubes easier to read than a good VU meter because they are slightly less sensitive (thus less likely to react instantly to every dynamic burst). But most serious recordists continue to prefer the accurate VU meter as the best guide in making their recordings.

My tape recorder has only three watts' power output per channel while I have a Fisher Stereo receiver with 30 watts per channel. I also have a rather good pair of loudspeakers which I'm using with the Fisher which I'd like to hook up directly to the tape recorder from time to time. Can I do it, or is the difference in power too great?

Sidney Meltzer
West Hartford, Conn.

The figure which should concern you isn't the power output of each amplifier, but rather the efficiency of the speaker. You should also be concerned with the resistance of the speaker as compared with the output on your tape recorder. If your speakers are high efficiency units, such as some Electro-Voice and University models, the chances are that your tape recorder will supply plenty of power for them. On the other hand, it takes most of the Fisher's 30 watts to power some lower efficiency speakers such as the Acoustic Research and KLH units. As a result, your tape recorder will produce poor results with them. For more details, see Hans Fantel's article on page 20.

Why haven't the raw tape manufacturers come up with a more attractive package for tapes—something like those tissue boxes, where the advertising comes off with the wrapper, for example?

Helen G. Brown,
East Norwich, Conn.

Good question.

tape

CLUB NEWS

Always looking for new members to join: Tapeworm's International Club. Benefits include: a monthly sound magazine on tape; world-wide membership; rosters. Round Robins, both mono & stereo services for blind members, etc. Membership fee is only \$1.00 per year. For further information contact: Charles F. Brown, 307 Main Street, Chatham, Mass. 02633 or Bob Piedot, 105 North Church Street, Neenah, Wisconsin.

A new and exclusive club has been inaugurated by a small nucleus of sound quality enthusiasts from Cheshire, England. It is called the British Ferrograph Owners Club and is open to all those who possess a Ferrograph machine.

Although the B.F.O.C. is not part of the Ferrograph Company, it is officially recognized by them, and has their blessing and promise of assistance. Already the company has supplied literature on their products and a sound history of the Ferrograph recorder which is being made available to members. Overseas owners will be welcomed into the Club. For further information write (with a stamped, self-addressed envelope, please) R.D. Littler, The Secretary, B.F.O.C., Kingswood, Silverne Drive, Ellesmere Port, Cheshire, England.

A recent issue of FLORIDA EDUCATION carried an article on classroom tape exchange entitled "Geography on Tape," by Sanford L. Glassman, 6th grade teacher at North Hialeah (Fla.) Elementary School. Mr. Glassman's pupils have exchanged tapes with New Zealand, Wales, Germany, Norway, and South Africa.

"I consider the exchange of tapes as a valuable teaching aid that stirs pupil interest and prompts creativity when it is adapted to the many areas within our curriculum," said Glassman.

For a subscription to TAPE SQUEAL, the monthly newsletter of the Indiana Recording Club, Inc. contact Mazie Coffman, Secretary, 4770 East 39th St., Indianapolis, Ind.

The Amateur Tape Exchange recently began its sixth year of operation to encourage home recording as a hobby. The association now has a library of about 200 tapes.

The Club's magazine DECIBEL and the association's news letter FEEDBACK will be amalgamated and circulated free to all members during the first week of every month.

An intensive publicity campaign has been started to increase membership. It will point out that tape letters are only one facet of the home recording hobby and emphasizes the free circulating library that demonstrates many other interesting hobby angles.

To insure democratic membership representation future executive discussions will be recorded and edited on tape. Sufficient copies will be made to distribute to all members willing to take part in policy making. Decisions made will include recognition of these members' comments. Address inquiries to: Mr. Joe Cain, 4285 Gouin Blvd. East, Montreal, North Quebec, Canada.

Tape recording fans in the New York area are invited to join a new club currently being formed by Harry Bergman, 1675 Andrews Avenue, Bronx, New York 10453.

With the aid of this magazine, Mr. Bergman hopes to present many interesting speakers and a wide variety of special features.

A new tape club, Teen Tape Club, has been established. Membership is

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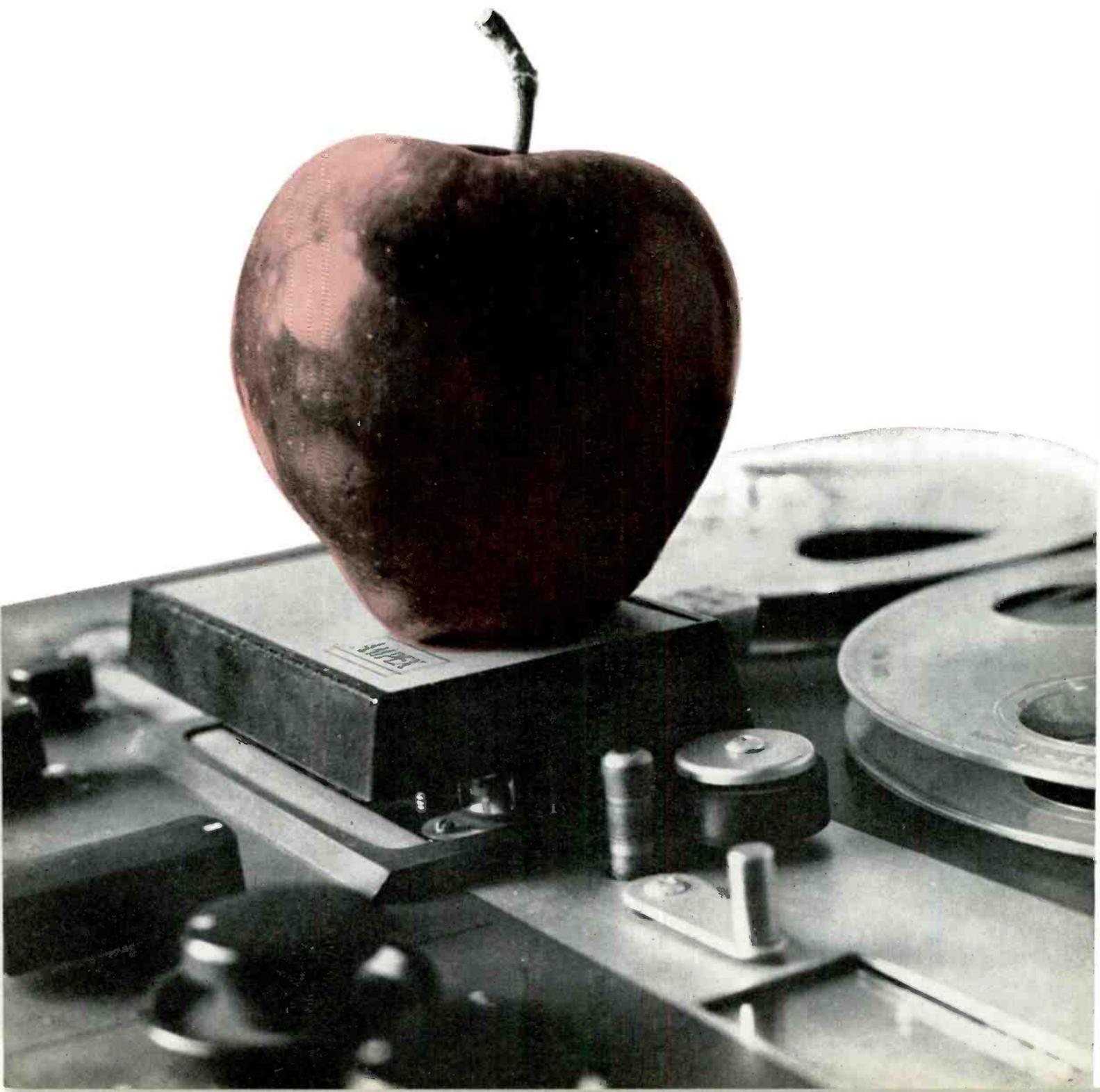
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not restricted to teens; pre-teens and adults are also invited to join this new club. It will strive to send out a monthly round robin tape on which is recorded club news, music, and other things of special interest. More information can be obtained by contacting:

John Rinker
Teen Tape Club
1906 No. 87th Street
Omaha, Nebraska 68114

Tape Teaching – Does It Work?



— A Debate

by F. Gordon Boyce

F. Gordon Boyce, a former newspaper reporter and freelance writer, is president of the U. S. Experiment in International Living, the oldest and largest international educational institution of its kind in the world. Intended originally to prepare American students to live abroad in the homes of Europeans, Asians and Africans, the project was expanded first to provide indoctrination and language instruction for foreign students planning to study in the United States. These two services were offered jointly to American colleges and universities—with particular emphasis on intensive language instruction. With the coming of the Peace Corps in 1961, the Experiment became the leading training organization dealing with language instruction and background on customs in the countries to be visited. At present, the Experiment has provided language instruction for more Peace Corps Volunteers than any other private voluntary organization.

One of the most useful tools technology has given educators is the language laboratory, which, since its introduction in 1953, has improved both the quantity and quality of students studying foreign languages in public schools and colleges. In 1953, for example, the Modern Language Association reported that some 1.4 million high school and college students were studying at least one foreign language. Today, the figures stand at better than 2.7 million—and today's students have better language skills than did the students of only 10 years ago.

One recent study showed students from schools which have language laboratories score 12 per cent better on vocabulary tests than students who do not have this advantage—and a whopping 31 per cent better on oral examinations. The reason, of course, is obvious. The language laboratory offers each student a chance to hear himself recite—to speak the language he's studying. It also makes it possible for the instructor to spend his time more efficiently with each student, correcting errors as they occur. (*Please turn to next page.*)

by Judith Head

Judith Head, Chairman of the Department of Language Instruction at Institut International in Montesano, Switzerland, recently completed a six-month tour of language departments in high schools and colleges in the eastern United States and Canada. A native of Wellington, New Zealand, she is a graduate of St. Albans College in Auckland, N. Z. and McGill University in Montreal. She has done post-graduate work in modern languages at Exeter College in England and at the Sorbonne. Her Ph.D. was conferred by the University of Caen. Her work at Institut International includes the supervision of students from some 14 countries in Western Europe, Africa, and North America, preparing for entry into American colleges and universities. It also includes helping American students studying abroad to become familiar with the language and customs of the countries they're visiting. Institut. International was founded in 1931.

Judging from the students we receive from school systems using language laboratories as opposed to those from non-lab schools, it would appear that the labs actually interfere with language learning—whether the language is French, German or English. It seems unlikely, but students from non-lab schools consistently score higher on written grammar and vocabulary entrance examinations than do students who have used labs. This phenomenon isn't limited to Institut International. It has been uncovered in the United States as well where, in 1963, Columbia University Teachers' College published a report which showed a substantial difference.

If nothing else, it has been argued, graduates of language laboratories have better pronunciation than do textbook students. That's true if the teacher who programs the system has excellent pronunciation. If she doesn't, she may be no better than no teacher at all. Part of Institut International's activities include bringing students into contact with families and social groups in Switzerland where they are unable to speak their native tongue, whatever it may be. Each year, we discover that a cer-

Until the postwar years, languages in American schools and colleges were something of a poor stepchild. Parents questioned the need for language instruction at all. School systems were hard put to find teachers who had been any closer to France than a weekend in Quebec and a language course in college. As a result, as late as 1954, the shortage of language instructors threatened the college accreditation of some 200 or 300 high schools across the country. In others, the quality of instruction was questionable. Students had no opportunity to practice the language they were studying, or to hear it spoken as they can in a language laboratory. It was the exception rather than the rule when the child carried his language learning beyond the classroom. How many reading this article, for example, continued language learning beyond school?



At the time of the Big Change, language instruction still was geared to the world which existed before 1939. Latin and French were the languages offered exclusively by all but the most progressive school systems—partly because the only use parents of college preparatory students could envision for language was a possible trip some day to Paris. During World War II, it became clear that Americans would have to learn to speak a variety of

tain number of students who may have scored well on language examinations before they came to us are totally at sea. They seem unable to associate the sound of a word or phrase with its appearance on paper. And, more often than not, these students have had the benefit of a language laboratory.

I've mentioned the ability of the instructor. This is one of two factors in language study which determine how well any child will do. The other is motivation.

A student who is motivated will learn a language, if he has to do so in the gutter. One who isn't, won't. An excellent example are the children of U.S. and Canadian military personnel stationed in Germany. Younger children attached to these military bases quickly pick up German—or at least enough to make themselves understood—because the local children with whom they play can't speak much English (it might be noted that this process works both ways; the German youngsters also learn English). Teenagers and young adults, however, learn very little German because they have very little contact with the local population. They do their shopping at the PX, they date sons or daughters of other GIs, they go to the Post movie and listen to Armed Forces Radio. I'm told that some youngsters who speak fluent German at six are unable to pass vocabulary tests by the time they're fifteen.

Motivation accounted for the rapid rate with which GIs during World War II picked up foreign languages, at least as much as the methods used to teach these languages. If you know you've got to learn a language to get along—whether it be for travel, business or some other reason, you're much more likely to learn than if the only ostensible reason is to pass a test to get into college. American colleges and universities are beginning to realize this and are organizing semesters abroad so that students can practice the languages they're forced to learn.

In the late 1950s, American public school systems, aided with National Defense Education Act funds, went on a building binge. One suburban community would open a spanking new language laboratory, and show it off to the taxpayers as an example of how excellent the school system was. The community just down the line couldn't sit idly by. It had to open its own language laboratory—with an extra flourish or two that the first one had overlooked. Before long, language labs were mushrooming wherever a local school board found itself with a little extra money—and this happened at the expense of other needed improvements.

The next step, of course, was that ratepayers in Town A began boasting to their neighbors in Town B that "Our language lab can lick your language lab." This physical plant became, in the popular mind, a criterion for judging the worth of a school system. All of this happened at a time when language instruction became very popular—when it

tongues in the postwar world—including such “outlandish” languages as Russian and Japanese—if we were going to get along. Slowly, some school systems added German, Italian and Spanish. But as recently as 1961, French and Spanish accounted for 37.5 and 28 per cent respectively of all students studying a foreign language in colleges and high schools. Language laboratories made possible the addition of Russian, Hebrew, Japanese and other more practical languages for today’s world.

To understand the role of the language laboratory in today’s language instruction program, it’s important to realize the things a language laboratory can do and those it can’t. Many educators and parents make unrealistic demands on school and university language departments because they’ve been oversold on the wonders of language labs. A language laboratory can help a child to learn by providing him with the tools for intensive training and study. It can, if he’ll let it, provide him with speech skills which never could have been obtained from a textbook. It can help him improve and practice speech patterns. It cannot, of course, provide motivation for the child who doesn’t want to learn. It can’t replace the incompetent teacher—but it can enable the gifted teacher to give more children more individual attention than ever was possible when textbooks alone were used. The language laboratory, in short, is limited by the instructor who is in charge of it.

In our own case, last year, we subjected 59 college students who had had one year or less of a foreign language to an intensive 17-day program prior to their departure for a summer abroad. The program involved 30 hours of classroom drill supplemented by laboratory work each week. Since the laboratory was open at all hours of the day, it served as a vital extension of the teacher in such an intensive program. At the end of the 17 days, each student was given the Modern Language Association Cooperative Foreign Language Test in his appropriate language by the Educational Testing Service, and these scores were compared with norms for students who had completed one year of language study. Those who had never studied the language before scored in the 67th percentile in speaking; in the 39th percentile in listening; and in the 26th percentile in reading.

These students then spent a summer overseas and were retested. This time they scored in the 90th percentile in speaking and listening; and in the 71st percentile in reading.

The language laboratory is by no means a miracle worker. But in the hands of competent instructors in a well-planned program, it is a highly effective and extremely useful device. It is popular with students, as well. Some 90 per cent of our participants take the view that the audio-lingual method is the best and only way to learn to speak a foreign language fluently.

was considered “cute” for tots of seven and eight to come home and practice their French or German, despite the fact that the youngsters had no interest whatever in the language and no incentive to learn it (as opposed to those children in Germany who had plenty of incentive).

The fact is, unfortunately, that there are far more poor language instructors in North American public and private schools than good ones. In the hands of a good instructor, a language lab can fulfill an educator’s dream. But in the hands of the average small-town French instructor, it simply wastes an hour a day of the student’s time. The excellent language teacher must know her subject, must be able to communicate it and—most important of all—create an interest in students where no interest exists. Personal contact is required.



The statistics revealed by the Columbia University Teachers’ College study and my own observations tend to argue that language laboratories magnify the faults in language instruction. I think they tend to gloss over incompetence, making it possible for the poor teacher to hide behind a bank of tape recorders. I know that some students who come to us with excellent language grades from language laboratory systems are shocked when they see the results of our exploratory exams (and I’m shocked, too). Some of these same problems show up with students from less progressive schools—though usually not as seriously and not in as great numbers. The latter always are much stronger in vocabulary and grammar than the former, and frequently pronounce things better. There’s no doubt in my mind that they are better able to correlate the spoken and written version of a language.

No, I’m not unalterably opposed to language labs, any more than I’m opposed to chalk and a blackboard. What I am opposed to is the spending of money for equipment with the assumption that this automatically will turn out students proficient in French or German or English. We’ve got to get better people programming these systems. And we’ve got to show students sound reasons why they should study and learn a language.

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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.

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TIPS FROM THE PROS

(Continued from page 8)

is remarkably accurate. The same principle can be adapted to recorders which keep the tape away from the heads while they're in fast forward by playing a tape recorded at, say 3¾ ips, at 7½ ips (or whatever the fastest speed on the machine may be). A slightly less accurate way (although certainly better than guessing from the opening bars of the music, which is what many home users do) is, if you know the music you're duplicating well, to pick out the loudest passage you remember and set your volume controls while playing it.

If the tape you're duplicating is a slow-speed talk tape, you can duplicate it in half the time or less by upping the speed of both recorders. It's possible to record an hour-long tape recorded at 1⅞ ips in just 15 minutes by operating both machines at 7½ ips. However, don't try the same procedure with music. The recording curves built into all home recorders are different for 7½ ips than they are for 3¾ ips—the high frequency boost present at the slower speed is dropped at 7½, so 3¾ ips recordings duplicated at the higher speed lose a significant share of high frequencies. As a result, your duplicated music tapes may sound flat and uninteresting.

Many recordists transfer bits from a number of tapes onto a single tape as a means of keeping their collections within manageable proportions. Frequently the transfers are a bit disappointing—because the original recordings were made at different levels and transferred without proper compensation and because there's an annoying click between each selection as the recorder is turned on or started. The level problem can be solved by remembering to sample each selection before transferring. This can make for a difference in the level of tape hiss between one recording and another, however. My answer for this is to take a virgin strip of tape, record on it with no sound input, then cut it into short strips and splice it between the selections, cutting out the original connection (if there was one). The result is a sustained level of tape hiss 'way in the background, and an absence of abrupt changes or clicks.

tape

EQUIPMENT REVIEWS

We believe that there are four major categories of recorder on the market today, each serving a different need and each requiring a different type of testing to produce the maximum amount of information for a prospective purchaser or user. These are the economy models, primarily designed for tape beginners on a budget; moderately priced machines for general home use; component-quality recorders and decks; and battery-operated portables. The first group, which generally includes those machines priced under \$200, are judged on the basis of value for money, ease of operation, features and durability of construction. Those in the middle price range (from \$200 to about \$350) are judged on these bases plus their high fidelity characteristics. Since some purchasers will be interested in sound fidelity, we publish those test results which best indicate the capabilities of the unit to the user. For component-quality recorders and decks (those priced above \$350), we include full test results and discussion of construction as well as data on features, ease of operation, etc. Since most battery-operated portables are admittedly of limited fidelity, our reports concentrate on reliability, quality of construction, ease of operation, portability and other factors more likely to be of interest to the portable user. Those few battery-operated portables which do claim to be component-quality units will be reported on with full technical details.

We have adopted this procedure of testing and reporting because we believe it can best help readers to find the right machine for their particular needs and because it seems to us patently unfair to compare the technical capabilities of a \$149 recorder with one designed to sell for twice or three times as much.

Magnecord 1024



If you've owned a couple of tape recorders, your component system has reached a point of refinement where you would like to equip it with a truly professional recorder and you are willing to part with \$655 to do so, then you would do well to consider the Magnecord model 1024. Your first impression may well be that it looks like a battleship, but the resemblance doesn't stop there. It's built like one, too, and probably would last you the rest of your days. It is a plain looking machine, without much decorative effect, but looking in depth will convince you that nothing was left to chance mechanically or electrically. The recorder we tested came with a "pedigree" sheet attached, showing the factory final test results.

The tape transport and electronics are separate packages. The transport is built on a solid die casting and is equipped with two split capacitor reel motors, one for each reel, and a two-speed hysteresis synchronous motor, which drives the capstan through a flat belt. Three flywheels smooth out the tape drive. A large flywheel, into which a cool-

ing fan is cast, mounts on the rear of the capstan motor. Another large flywheel, which serves also as a drive pulley, is mounted on the capstan shaft. Drill marks around the rims of the flywheels indicate that they have been dynamically balanced.

At first the electronics package may strike one as having an abundance of knobs, but one soon learns that this recorder makes use of all of them. The electronics are completely transistorized. The record amplifiers and bias oscillator each are built on a plug-in modular card. Separate gain controls are provided for each microphone and line input. These, with the master record gain control, form a built-in mixer. A third pair of line inputs, directly to the master gain control, are brought out on the rear, permitting the mixing of three pairs of inputs, provided those going in direct have their own level control.

Each playback channel has its own gain control for balancing while the playback master gain controls both channels at once.

Microphone jacks are on the front. There are two outputs per channel, both can be used simultaneously to feed two stereo systems or two other devices. The earphone monitor jack is on the front panel. A switch selects stereo operation for the phones, or monaural phones operation on either of the channels.

Meter and monitor switches permit visual and aural monitoring of source or tape and a check on bias when in record mode. A channel selector switch allows the choice of recording in stereo or monaural on either channel, with lights to indicate which record channels are functioning.

Operating tape speeds are $3\frac{3}{4}$ and $7\frac{1}{2}$ inches per second. Since speeds are electrically switched, they may be changed at any time. Equaliza-

Test Report

Make: Magnecord

Model: 1024

Wow & Flutter:

7.5 Ips.

Wow

.05%

Flutter

.04%

Combined

.15%

3.75 Ips.

.1%

.07%

.2%

Rewind Time: 7 inch reel, 1200 feet

1 Min., 20 Sec.

Fast Forward: Same reel

1 Min., 20 Sec.

NAB Playback Response:

7.5 Ips. —10 VU.

L ch. R ch.
+ 1 db., —0.5 db. +0.75 db., —0.75 db.

Maximum Output:

—10 VU tape @

400 cycles

L ch. R ch.
3.15 v. 3.10 v.

Signal to Noise Ratio:

Re: 3% THD @ 7.5 Ips.

@ 3.75 Ips.

L ch. R ch.
—53 db. —53 db.
—54 db. —55 db.

Record/Playback Response:

7.5 Ips —10 VU level

3.75 Ips —15 VU level

L ch. R ch.
+1.75 db., —1.5 db. +1.25 db., —1.0 db.
+1.0 db., —1.5 db. +2.25 db., —1.0 db.

Distortion:

@ 400 cycles

2nd harmonic

3rd harmonic

L ch. L ch.
0.2% 0.2%
0.8% 0.85%

Sensitivity:

Mic.

Line

L ch. R ch.
1.6 Mv. 1.7 Mv.
70 Mv. 80 Mv.

Record Level:

Re: 3% THD

L ch. R ch.
+7 db. +8 db.

tion is on a separate switch and this will have to be kept in mind.

The Magnecord 1024 easily met its published specifications and, in fact, well exceeded most of them. In operating tests of reproduction of commercial tapes, it was superior to anything, except professional machines costing considerably more money. Record and playback at fast speed was flawless. A considerable amount of A-B ing was necessary to distinguish differences at the 3¾ ips

The recorder is equipped with quarter-track erase, quarter-track record and quarter-track play heads. Space is provided for a fourth head. (The manual suggests a half track play head in this space). Switch and wiring for the fourth head are already installed. The tape gate provides superb tape guiding and controlled wrap.

The transport handles tape with ease and gentleness. Response to all controls was immediate and positive.

Fast buttoning from rewind to fast forward and back again showed no tendency toward tape looping. The brakes, pressure roller and tape gate are solenoid operated. The pushbutton controls are centrally located, clearly labeled, and easily reached with either hand. There is a record interlock which must depress simultaneously with the record button or prior to pushing the record button. There is an extra button marked "cue," which when depressed, locks in, lifts the tape to the heads, releases the brakes and puts low torques on the reel motors, allowing the tape to be rocked freely for cueing and editing. The Cue button may be released by depressing it again, or by going into a normal forward mode. During fast wind the Cue button will lift the tape to the heads. Ordinarily the tape is off the heads in wind modes. Head covers are easily removed, providing access for cleaning, degaussing and editing.

In spite of its rather plain squarish

look, the Magnecord 1024 is a lot of tape recorder, that will be best appreciated by the demanding recordist with an equally good component system. The Magnecord 1024 is, in a word, excellent.

EICO RP 100W



The EICO RP 100W is manufactured by Electronic Instrument Co., Inc. The list price is \$395. It weighs approximately 35 pounds and has dimensions of 15¼" W X 13⅜" H X 7" D. The electronics are transistorized except for the bias oscillator and its power supply. Separate record and playback pre-amplifiers for each channel permit monitoring for source or tape during recording. Construction of electronics is unitized. Level indicators are meters in the record amplifier circuits. This confines them to measuring record level only. There are separate inputs and separate gain controls for microphone and line in each record channel, allowing mixing of two inputs to each channel.

Microphone inputs are unbalanced and the use of low impedance dynamic microphones is recommended with the transistorized record amplifiers. Recommended impedances for the microphones are between 30 and 500 ohms. There are separate equalization controls for the record amplifiers and the playback pre-amplifiers. When using the recorder it is necessary to set these two controls and the speed selector control as well. There is a single output for each channel, with a nominal output of one volt. The outputs and the line inputs are not grounded automatically, but must be tied together and all grounded to a grounding connection provided for that purpose. We found this to be a rather sensible way to avoid ground loop problems that often plague installers of hi-fi equipment.

The tape transport is equipped with three motors. Two induction motors drive the reels, while the capstan motor is a hysteresis synchronous single speed type. Speed change is accomplished by shifting the "O" ring drive belt between two levels on the drive motor pulley. Action of the belt shifter is positive and it can be operated at any time. Dynamic braking and hold back tension is accomplished by applying predetermined amounts of direct current to the reel motors. The tape path is catenary and tape lifters hold the tape away from heads in the high wind modes. The tape break switch functions only when operating in the normal forward modes. There is a standard-type three-digit counter. The plastic

head cover removes easily to allow cleaning and demagnetizing of the heads and for editing. When changing operating modes it is necessary to go through the stop mode. No warning light for record is provided, but the required use of two push buttons to go to record mode precludes accidental erasure of a tape.

As would be expected with a hysteresis synchronous motor driving the capstan, wow and flutter were quite low: .1 per cent at 7½ ips and .15 per cent at 3¾ ips. Though the manufacturer makes no claim for NAB equalization, a check with an NAB tape showed consistently good response to 10KC. Overall record/playback response was somewhat better. At 7½ ips it was 3.5 db plus 4.5 db on the left channel and minus 3.5 db plus 5.25 db on the right channel. At 3¾ ips, the left channel was minus four db plus eight db and the right channel minus 5.5 db plus 8.5 db.

To sum up, the Eico RP 100W is probably not as eye-catching as some other recorders, but it gives a very satisfactory account of itself when compared in areas of performance and construction.

Roberts 1630



A nice recorder for the tape enthusiast with a limited budget. It doesn't have some of the convenience features and facilities found on more expensive recorders, but those it has are adequate and work well. Before proceeding with any of the instrument tests, we recorded on both channels with a low priced microphone and found that the Roberts 1630 gave a most pleasing account of itself. Later we recorded multiplex FM from an unfiltered tuner and found not a trace of beats from mix-

ing of the pilot and re-inserted carriers with the bias. Furthermore, the quality of tapes when played back, listening with earphones, was indistinguishable from the sound during recording. We noted that the recorder cannot be laid on its back with the phones plugged into the jack, since the plug extends beyond the feet. The sound levels into the earphones are adequate for listening in a boiler factory. (Due to the fact that the speakers are so close together in the case, stereo effect from the speakers is hard to distinguish from monaural listening.) White noise from the amplifier is noticeable when listening on a set of good phones.

The microphone jacks are conveniently located on the front. The one VU meter serves both channels for record and playback. There is a separate record/playback gain control for each channel, to permit easy channel balancing, and a ganged tone control which functions only in playback. The record switches are mechanically interlocked to the start lever and each time the recorder is stopped it returns to the play mode of operation. A convenient neon lamp indicates when the recorder is in the record mode. The Roberts 1630 is equipped with a very handy pause lever. The two operating levers for the mechanism are interlocked and are simple and positive in operation.

Because the earphone jack and other input and output jacks are located on what would be the bottom if the recorder was placed horizontally, it appears that it was intended for vertical operation, and it works very well that way.

Monitoring from the tape is not possible since the Roberts 1630 switches its dual amplifiers for record and playback. The 1630 is equipped with a quarter track erase head and a quarter track record/play head. Tape guiding is minimal, but very highly effective. There are no pressure pads and tape is lifted from the heads in high wind modes. The tape break (runout) switch is located between the payout tape guide and the head mount. The three digit program counter was found to have high accuracy. Storage space for two reels and the line cord is available in the front cover, allowing the Roberts 1630 to become a fairly easy portable

machine. Two operating speeds: $7\frac{1}{2}$ and $3\frac{3}{4}$ inches per second, are available through capstan change and a convenient stud is provided for storing the fast speed capstan when it is not in use.

The Roberts 1630 met the wow and flutter specification at 7.5 I.P.S. tape speed. Rewind time for 1200 feet of tape on a seven inch reel was two minutes and 34 seconds, while fast forward time was just a bit slower, two minutes and 42 seconds. Preamplifier output levels were 1.5 volts left channel, 1.7 volts right channel from a zero level tape at full playback gain. This output is more than enough to drive any preamplifier or power amplifier. Signal to noise ratio measured 38 db. below the three percent total harmonic distortion point. Microphone sensitivity was measured at 1.15 Mv. and 1.25 Mv., left and right channels respectively. Line input sensitivity measured 120 Mv. and 140 Mv. Zero indicated record level was found to be 4.5 db. below 3% THD for the left channel and 5.5 db. for the right channel. The VU meter was found to be accurately calibrated. Distortion on the left channel for zero record/zero playback was found to be 2%. For the right channel 2.5%. A separate switch controls the speakers, which may be used for monitoring during record, in the normal manner for playback, or muted to avoid acoustic feedback when using microphones in close proximity to the recorder.

Oki 111



For the student who wishes to record lectures or exercise his foreign language, or for that matter his English vocabulary, the Oki 111 is ideally suited. It is a light weight (approximately 14 pounds), compact ($11\frac{7}{8}$ " wide, $12\frac{5}{8}$ " H x 6" D) monaural half track recorder having a small power amplifier and self contained 3 x 5 inch speaker. A small dynamic microphone is also supplied. All that is needed for a complete recording system is a roll of tape. Price is \$99.95.

The instruction book supplied with the Oki 111 could have been a bit more thorough, but the simple, straightforward operation of the machine makes up for any lack of instructions. The Oki 111 electronics are transistorized, so there is no "warm up" time. Transistorized electronics contribute to the light weight and quick convenience of the recorder. There is a natural and functional arrangement of controls, which are mechanically interlocked and which give firm, gentle control of tape motion. An end-of-tape shut-off is not included.

A program counter is located in the plastic lower head cover, which is removable for editing or cleaning and degaussing of the heads. There are two heads, one for erase, the other for record/play.

The Oki 111 has a one motor mechanism and is uncomplicated mechanically. The motor is equipped with a cooling fan, but the air intake is on the bottom of the case and care should be taken not to place the recorder on a carpet or similar surface during operation, to avoid overheating. The recorder may be operated either in the horizontal or vertical position. Reel caps are provided for holding the reels during vertical operation. The accessory items can be packed in a plastic bag, which is supplied and stored inside the case. The A-C line cord is detachable (for inside storage) which makes for easier portability.

The Oki 111 has nothing to indicate that the recorder is erasing, but it is necessary to use both hands to get the recorder into record mode. It

would be quite difficult to accidentally erase a tape. The recorder automatically returns to play mode each time it is stopped. The Pause control functions well.

Our high school junior was given the recorder and instructed to use it. His comment was "The instructions are clear (belying our interpretation of the instructions) and the recorder is easy to operate. I would like to be able to adjust the record volume without having to start the tape though." Performance of the recorder was excellent for speech, pointing up its usefulness to the language student. Sensitivity of the microphone is great enough to permit the recording of class lectures, as well. Following the instructions for recording from the radio we used the patch cord to record from the FM receiver. The recording quality was very good, though it cannot be classed as high fidelity.

So far as performance technically is concerned, the Oki 111 met its specs quite well. Two minutes and two seconds were required to fast forward 1200 feet of tape, a good performance. Two minutes and 15 seconds were required to rewind the same reel of tape. At $7\frac{1}{2}$ inches per second, wow was 0.15%, flutter was 0.075%, combined totalled 0.2%, exactly meeting specifications. At the $3\frac{3}{4}$ inch per second speed, wow and flutter were higher, as should be expected. Slow speed would be alright for pop music, but not for a piano recital. Power output at the clipping level was 1.24 watts. Overall distortion (record/playback at zero indicated record level) was 2.8%, which is very well within specifications. Signal to noise measured 48 db below 3% total harmonic distortion, a comfortably useable figure. Considering the space and cost limitations placed on its designers, the Oki 111 acquitted itself very well.

The case cover is removable for greater convenience in operation. The front panel is of brushed aluminum and the recorder is neat and attractive in its overall appearance. The Oki 111 would seem to be ideally suited for student use because of its small size, light weight and easy operation.

Saxon 755



Here's the first battery-operated stereo portable, a three-speed quarter-track machine which can operate alternately off a car or boat battery, with a converter off a 110-volt AC line, or from six D cells. The unit, which sells for \$259.95, uses five inch reels and provides reasonable music recording and playback quality at $7\frac{1}{2}$ ips and adequate voice recording and playback at $3\frac{3}{4}$ and $1\frac{7}{8}$ ips. Although it is not (and doesn't claim to be) a high fidelity unit, the recorder has essentially a flat playback characteristic at $7\frac{1}{2}$ ips from 50 to 1000 cycles. Then it rises gently to a peak of +10 db at 5000 cps. It then drops off to -10 db at 11,200 cps. As a result, its sound quality cannot match that of better cord models at this price—but it is more than a match for most battery-portables.

The unit is styled attractively in black and silver. The two loudspeakers fold over to cover the tape transport when the unit is not in use. These can be swung out and angled to fit the peculiarities of various listening situations, thus provided better than average stereo separation and directionality. If further separation is desired, the speakers can be removed from the machine. The machine handles tape very well for a battery-operated recorder, with surprisingly low flutter—a perennial problem with battery portables. Rewind time for 600 feet on a five inch reel is 103 seconds. Fast forward for 600 feet on a five inch reel is 105

seconds.

The Saxon 755 comes equipped with two good-looking microphones, an assortment of patch cords, and a connector for operation from a 12 volt cigarette lighter. An AC converter is an extra-cost item. The ability to draw upon a wide variety of power sources is one of the machine's chief virtues, coupled with the fact that it is the first recorder so equipped to record and reproduce stereo. The unit can prove valuable on field trips, on vacations, and in other unusual locations where you may want to tape stereophonically. It bears the same relationship to \$250 indoor machines that the first broadcast-quality monaural portables bore to monaural indoor machines—it can do outdoors what the bigger machines can do indoors, only not quite as well. Where this feature is important, it will bear consideration.

The unit has one VU-tape meter with a switch which enables the recordist to ride gain alternately on the left and right stereo channels.

Concord 994



Looking for a tape recorder that's practically wifeproof and childproof? The Concord 994 is a man's machine, designed to prevent accidental erasure of valuable recordings by well meaning youngsters. This is accomplished by means of push buttons which require more than average pressure to lock into place. When you have done so, however, the automatic reverse feature takes over, put-

ting the recorder into continuous operation until you shut it off.

When automatic reversing began little more than three years ago it cost upwards of \$600. This machine is priced at \$350—some \$75 less than the next lowest priced unit. One advantage it offers is detachable speakers which can be positioned to give the best stereo results under a wide variety of circumstances. As noted above, the Concord 994 records and plays back automatically in both directions. The company prefers the use of metal tabs to a recorded tone for activating the reverse—a choice which some users may be inclined to debate.

At this price level, the recorder offers four heads (two erase and two record playback) rather than the six heads offered by some higher-priced models. This prevents off-the-tape monitoring, but does not rule out sound-on-sound recording. The monitor tape provided on the side of the recorder is for incoming signal only.

The machine operates at $1\frac{7}{8}$, $3\frac{3}{4}$ and $7\frac{1}{2}$ ips with a frequency response at the highest speed of 42-16,000 cps ± 2.5 db. Even at the slowest speed, response covered the 70-10,000 cps range ± 3.5 db. Wow & flutter figures at $7\frac{1}{2}$ ips in forward mode speed were .125 per cent combined (.07% wow and .12% flutter). Signal-to-noise ratio at the same speed was -47.5 db in the left channel at normal record level, -46.5 db in the right. The unit has two VU-type meters which allow precise monitoring of the record level and balance between channels. Independent tone controls are provided for each channel, but are effective only on the playback mode and, when adjusted, affect both the live and speaker outputs.

Tension on the tape is much less than that on some other automatic reversal units. In addition, turning off the recorder (even though the tape is playing) results in removal of tape and idler wheel from the capstan.

In summary, the Concord 994 appears to offer a happy combination of virtues—attractive price, the convenience of automatic reverse and protection against interference from other members of the family.

tape

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ADVERTISER'S INDEX and READERS SERVICE CARD INDEX

READERS SERVICE CARD NUMBER	PAGE
1 American Recording Tape	Inside Front Cover
2 Ampex Corp.	Inside Back Cover
3 Cipher	4
4 Citadel Tape Club	42
5 Concertone	3
6 Concord Electronics	7
7 Eastman Kodak Co.	11
8 Electro-Voice	Back Cover
9 Harman Kardon	13
10 Koss Electronics	6
11 James B. Lansing Sound	19
12 L T V University	48
13 Magnecord	9
14 Nortronics	12
15 Reeves Soundcraft	8
16 Roberts Electronics	53
17 Robins Industries	42
18 Sonotone	43
19 Tape Mates Club	43
20 Telex	30
21 Viking	10
22 Wesgrove	38

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