

tape

recording

How To Make
A Recording
From Tape

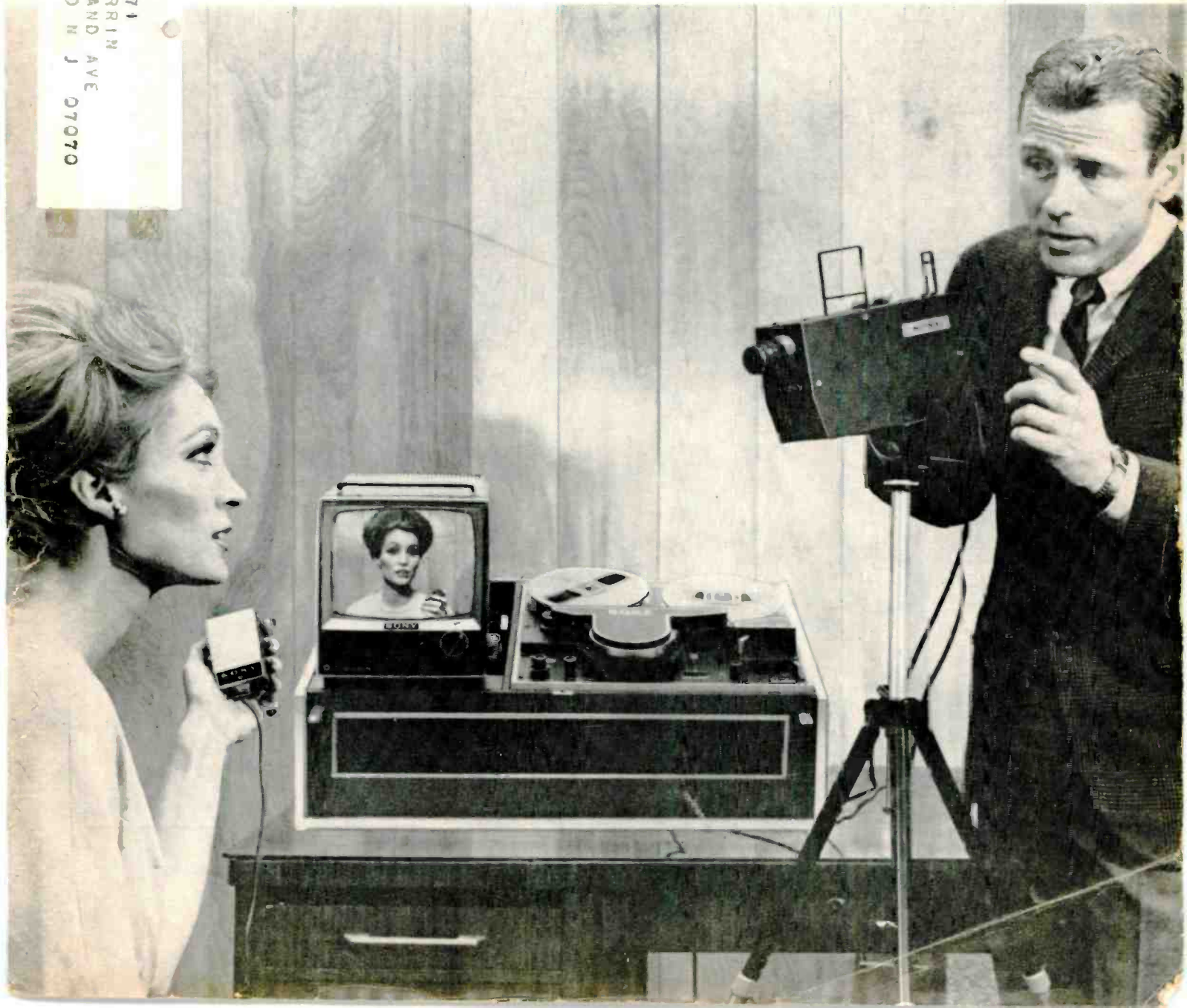
The Untold
Story of Tape
Recording—Pt. 2

60¢

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10/2/87



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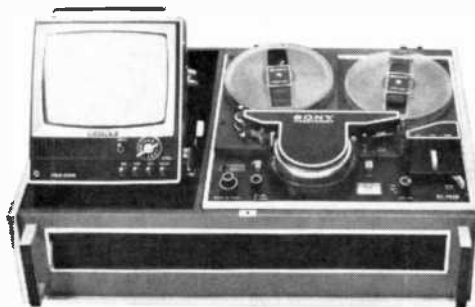


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Now it's easier than ever to own a Sony Videocorder® and the accessories that make it easier to enjoy instant movies with sound. During the period ending October 31, 1967, selected Sony accessories are free with the purchase of a Videocorder. Videocorders are priced so that it is economical to buy one for your own use. Video tape decks start at \$695; video tape recorders with built-in TV monitors, \$995. Your Sony dealer has something extra for you. Visit him now. (Participating dealers only).
Sony Corp. of America, 47-47 Van Dam St., L.I.C., N.Y. 11101.



SONY® VIDEOCORDER®

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tape

recording

JULY-AUGUST, 1967

VOLUME 14, NO. 6

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...handsome, compact,
versatile "best buy"
among automatic
turntables.

The new 60 Mark II has an impressive list of features, including lever type cueing control and anti-skating compensation, previously available only on highest priced units. The oversized turntable is cast and heavily weighted. The tubular tone arm is dynamically balanced with a completely adjustable and resiliently mounted counterweight. It has a precise gauge for setting stylus pressure, and will track and trip under $\frac{1}{2}$ gram so that any cartridge can be used, including the newest elliptical types. The 60 Mark II—\$74.50, less base and cartridge—is just one of five new Garrard Automatic Turntables. For a complimentary, colorful Comparator Guide describing all models, write Garrard, Dept. AK-11, Westbury, N.Y. 11590.



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by
martel

FAULTLESS REPRODUCTION AND PERFORMANCE CAN ONLY BE HAD THROUGH SUCH METICULOUS ENGINEERING AND MANUFACTURING PROCEDURES AS THOSE FOLLOWED BY UHER IN A FACTORY DEVOTED EXCLUSIVELY TO TAPE RECORDER PRODUCTION. THE UHER 9000 HAS ALL THE FEATURES NORMALLY INCLUDED IN THE MOST SOPHISTICATED TAPE DECKS, PLUS MANY EXCLUSIVE UHER FEATURES UNOBTAINABLE ELSEWHERE.

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tape

LETTERS TO THE EDITOR

Hear! Hear!

Huntington Woods, Mich.

I was encouraged when I saw the greatly increased readership and tape club support in the special issue of *Tape Recording*. Unfortunately, the American tape recording industry has yet to give your publication considerable advertising support. It is interesting to note that England is the home of two million tape recorders, and three monthly tape recording magazines. On the other hand, the U.S. has seven million tape recorders, but publishes only one bimonthly tape recording magazine. The proportions are illogical, and would be remedied if the tape recording industry would support *Tape Recording*, which in turn serves the country's tape recording enthusiasts.

Bruce Sherman
Director of the Great
Lakes Tape Club

Microphone/Headphone Addendum

Camarillo, Calif.

In your January 1967 Annual Buying Guide no mention whatever of the condenser microphone was made! These microphones vary in price from \$99.00 to \$500.00 but work very nicely with Ampex, Crown, & Tapesonic recorders you have indexed.

Also, in your listing of stereo headphones you omitted the "Standard of the Industry" the Permo-flux DHS Series headphone.

Please print an addendum in future issue.

Dwight N. Garrison
Sound Laboratory

Teens Tapesville Still Going

Kingsport, Tenn.

Could not help noticing in your last issue of *Tape Recording*, that Teen Tape Club had announced a "merger" with Kip Kennedy's Teens Tapesville. Gentlemen, Teens Tapesville is very much in operation. There has been no merger. There is no merger planned nor has a merger been Ok'ed by our staff.

Recently both directors of Teens Tapesville had to fulfill their military obligations and hence without directorship we had no way of keeping the club in operation. We made agreement that Teen Tape Club would handle our membership in our absence. We are however back in full operation at this time.

Teens Tapesville, its directors and members welcome any inquiry from persons interested in our club. Although we can't truly claim the largest membership in the USA we can say that we are a rapidly building organization with teen interest at heart.

We will appreciate your announcement that Teens Tapesville, 2013 E. Sevier Ave., Kingsport, Tennessee, 37664 is still in operation and welcomes new members.

Respectfully yours,
Kip Kennedy
Director

Tape Recording

tape

TAPE NOTES

DEPARTMENT OF (MIS) INFORMATION

SCENE — Alexander's Department Store, New York City.

WOMAN CUSTOMER "... but can I get parts for it? (a small Panasonic reel-type tape recorder which the clerk had just finished selling to her)."

MALE CLERK — (imperiously) "I don't care what kind of a tape recorder you buy, Panasonic, General Electric, Emerson . . . all the parts are made in Japan. . . . No problem getting parts. . . ."

This is typical of the kind of mis-information the consumer gets in his search for a tape recorder; typical of certain kinds of salespeople, certain types of stores. Maybe you've experienced something similar. . . .

We can't change the retail selling scene; all we can do is try to provide the right information. As to the above, there is SOME truth to the statement, but it is far from the whole truth.

Many of today's portable tape recorders *are* made in Japan. . . . even though they may carry a famous American brand name such as G.E. But . . . many are NOT made in Japan and neither are the parts. In this case the salesman was correct in stating that the Panasonic unit was made in Japan. A GE *might* be, but it might also be made in part by V-M Corp., a supplier of recorder assemblies to American producers for use under their brand names.

As for the Emerson brand, the clerk was entirely wrong. That firm's products were made for it by Telectro, a New York firm long in the tape recorder field. Those recorders were made in the United States, using American-made parts. At some point soon, Emerson will be bringing in Japanese-made recorders.

There is all sorts of "cross-pollination" in the tape recorder field. For example, some assemblies

(Continued on page 50)

tape without Koss stereophones?

who'd gamble it?

You don't have to gamble on taping sessions anymore.

Plug Koss Stereophones into your recorder and you monitor every sound as it's recorded. Overload? Distortion? You'll catch it immediately. Microphones properly placed? You bet! You'll hear it all with dramatic Koss Stereophones.

Best for Editing and Playback, too.



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KOSS ELECTRONICS INC.

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Koss-Impetus, 2 Via Berna, Lugano, Switzerland

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every tape recorder
owner
**OUGHT TO
HAVE
HIS HEAD
EXAMINED!**



If you've been using your tape recorder regularly for a year or more—the tape head is probably worn out. As the oxide coating on the tape comes in abrasive contact with the head, it gradually grinds away the metal. Output becomes erratic and high frequency performance suffers. Crisp sounds become mushy. Vivid tones get blurry. Without even realizing it, you *lose* the fidelity and realism your tapes and equipment are capable of giving you.

Every tape recorder should regularly have the Look-Touch-Listen test that immediately tells you if it's head replacement time. Ask Nortronics—world's leading tape head manufacturer—for Bulletin 7260 that explains this simple do-it-yourself test. If you do need a new head, ask your dealer for a Nortronics replacement!



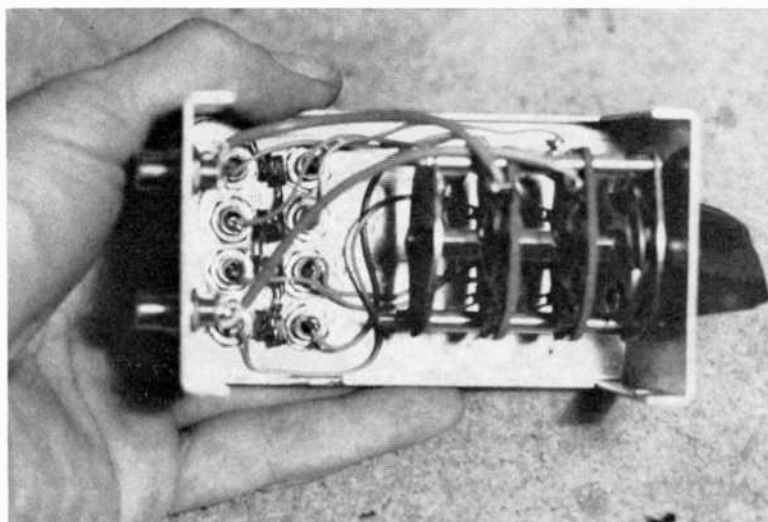
Nortronics
COMPANY, INC.

8101 Tenth Avenue North
Minneapolis, Minnesota 55427

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tape

SWITCHBOX TAKES THE
CHORE OUT OF CARTRIDGE
TAPE LISTENING



The tape buff runs into specialized problems with stereo playback equipment. One of these problems is the lack of several auxiliary inputs for situations involving more than one tape recorder. The switching arrangements on most amplifiers are barely adequate for one tape recorder. Some units will accommodate playback from a second machine. Add a third player, such as a cartridge tape playback unit, and listening becomes a chore, with unplugging and replugging jumper cables that are not designed for any amount of handling.

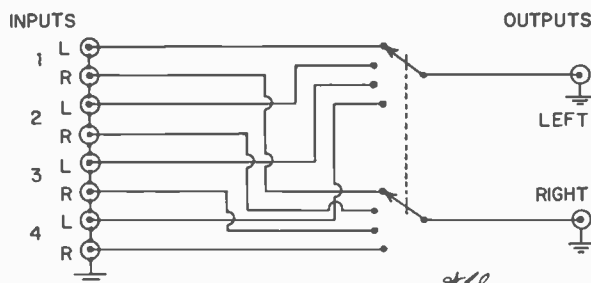
In this case, it was an 8-track home cartridge player that broke the camel's back.

Three tape recorders plus any

auxiliary inputs you may want to use can all be accommodated by a simple switchbox that you can build for less than \$3.00. As shown here, the box has four stereo inputs (three tape machines and one auxiliary) and one stereo input which plugs directly into the amplifier's "aux." input.

The switch is a 4-position rotary type mounted in a 4 x 2 1/4 x 2 1/4 Minibox and 10 single-hole mounting phono jacks. Two jacks are mounted on the back of the Minibox and provide the stereo output which is connected by shielded jumper cables to the auxiliary input on the amplifier.

As shown, the switchbox has three stereo inputs for tape recorders and one pair for auxiliary



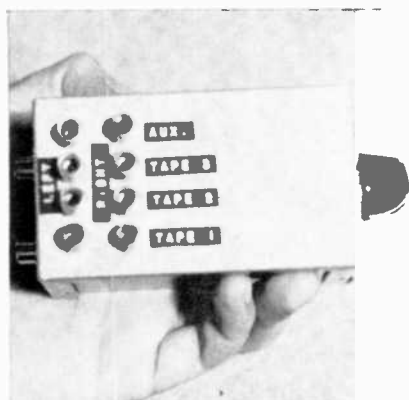
We re-invented tape recording.



inputs. A simple flip of the switch selects any of the four inputs instantly.

The 10 jacks take $\frac{1}{4}$ -inch holes; the switch requires a $\frac{3}{8}$ -inch hole, plus (with some switches) a $\frac{3}{32}$ -inch hole for the switch's keyway.

Internal wiring should start with the common ground connections. Wire all ground lugs on the jacks together with a single piece of bare stranded wire. Solder all the



ground lugs to this wire except the ones on the two output jacks.

Connect the output jacks to the common switch wipers on two switch sections with a shielded cable. Solder the shields to the two ground lugs. At the switch end of the cables, cut off the shield braid.

The other connections can be made with ordinary hookup wire since the metal box is at ground potential and will provide good shielding. Now close up the box, connect the jumpers, and you're in business.

Parts List

Catalog Numbers—Lafayette Radio
111 Jericho Turnpike
Syosset, New York 11791

- | | | |
|----|--|--------|
| 1 | 4x2 $\frac{1}{4}$ x2 $\frac{1}{4}$ Gray Minibox
12C8387 | \$1.06 |
| 1 | Mallory rotary switch
30 C 4018 | \$1.05 |
| 10 | Single-hole phono pin jack
C6234 | \$1.35 |

BY WALTER G. SALM

It started with the Compact Cassette. Norelco introduced the Compact Cassette in the United States—it's the tape you don't have to tangle with. It's about the size of a cigarette pack. And just as easy to store and handle.

The tape is pre-threaded inside the Cassette so you never have to touch it. Just snap the Cassette into the recorder and it's ready to play.

Norelco left the good things in, locked the bother out. The Norelco Compact Cassette both records and plays back. (Most cartridges can only play back.)

Unlike other cartridges, it has fast forward and rewind for easy indexing and program selection. It has full stereo compatibility. And unsurpassed sound reproduction.

About the only thing the Norelco Compact Cassette doesn't give you is the headache of tape handling. The lugging, the loading, the threading,

the tangling—they've all been locked out of the Norelco Compact Cassette.

Norelco made a unified sound system. Norelco has the most complete cassette line in the business. And the Norelco Compact Cassette is completely interchangeable with every machine in this line.

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If you used to be interested in tape recording, but decided it wasn't worth the fuss and bother, take a look at the re-inventions in the new 'Norelco Sound System.' You just might get re-interested.

Norelco®

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

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Home Videotape: Buy Now Or Wait?

by Robert Angus

Video tape recorders have been on the scene for somewhat over 10 years, serving initially as a medium for storing television broadcast material. In the past few years they have moved into the industrial field, into the educational field, and into the home (hence the term "home video tape recorder" or HVTR).

In the past year TAPE RECORDING has been bombarded with various questions on the medium, and herewith are some of those questions, along with answers.

If questions you have are not answered in this group, please feel free to fire them to us. We'll wrap them up into a future Q and A column (unless you need an immediate response).

Q. What is a home videotape recorder?

A. A tape recorder which inscribes pictures as well as sound on a length of magnetic tape. It operates through a conventional TV set. It can record directly off the air (from the television set) or live with the aid of a closed circuit TV camera. To qualify as a so-called "home" videotape recorder, it should be priced at \$2000 or less.

Q. What is the price range of home video recorders?

A. So-called home video tape recorders sell for from \$695 to \$1695, depending on manufacturer, what's included (no camera comes with the \$695 model, for example), and so on.

Q. Isn't it true that Shibaden, a Japanese manufacturer, has announced that it hopes to cut the price of its HVTR from \$1295 to \$140?

A. Not exactly. We understand that Shibaden is building a new videotape recorder plant in Sendai, Japan. The new plant reportedly will produce a new model—hopefully by the end of 1967—which Shibaden hopes to sell for \$140 to \$165. The present model includes a TV monitor which would not be supplied with the new model.

Q. How likely are other prices to drop by next year?

A. Sony has a new black & white model, the CV-2100, which it plans to sell in Japan for \$606.

Ampex marketing manager John H. Trux has predicted that "There will be videotape recorders on the market next year at this time for between \$450-\$750." He said such models would be available from Ampex and probably other makers as well.

Q. So far all the machines we've heard about have been black & white. What about color?

A. Earlier this year, California inventor Chester Newell demonstrated what he claimed was a low-cost color videotape recorder. Arvin Industries has announced that it will soon be introducing a low-cost color home videotape recorder. The company hopes to have a product on the market by this time next year; but isn't saying whether the price will approach the \$495 talked about by Newell. Ampex has maintained all along that its one inch models would be convertible to color and that all its models would be color compatible. The problem with recording in color is developing a low-cost color camera. These units have come way down in price but a color camera for under \$5000 is still a long way off. A color camera for under \$500 will take much longer. Until then, color recording will have to be limited to color broadcasts only. A low cost color VTR is certainly on the way.

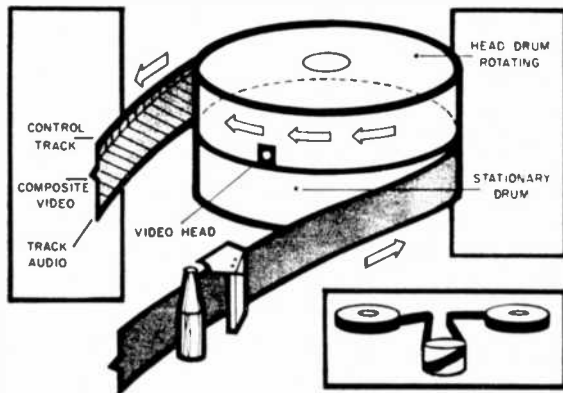
Q. Why is it that everybody in the videotape

The problem with recording in color is developing a low-cost color camera.



Portability is the key to this new battery operated video tape recorder from Sony.

VTR: Buy Now or Wait . . .



field announces a very low price, then either doesn't deliver at all or comes out with a product at a very much higher price?

A. There was an unfortunate tendency at the birth of HVTR for inventors to demonstrate incomplete prototypes of videotape recorders, to make unrealistic claims for their performance and to promise lower prices than production conditions would allow. Most of these have long since passed from the scene. Today, the promises come from firms already established in the field, and they are within the scope of present technology.

Q. If prices are coming down and color is on the way, doesn't it make sense to wait?

A. For the average home user, it probably does. For low-cost videotape's present customers—industry, education and medicine—there's less point to waiting. The reason is that many new machines will be stripped-down versions of current models, which means that the user will have to buy his camera and monitor separately. It's assumed also that the home user can get by with less detail in his picture than can the professional user. Thus some of the less expensive models may offer slightly lower quality. If color and price are important considerations, you'd probably be happier if you waited.

Q. How does home videotape work?

A. The home videotape recorder is similar in many ways to the audio recorder. Like an audio recorder, it can replay instantly anything recorded on tape. Like an audio recorder, it can use the same piece of tape over and over again. It even looks like an audio recorder. And it uses magnetic tape.

There are differences, too. Because the HVTR must get a great deal more information on the tape, it utilizes more tape than does the conventional audio recorder. The first home units used

standard quarter-inch recording tape at speeds of 120 ips—16 times that of a conventional audio recorder. By using tape at such a rate, these machines drastically limited recording time per reel because you simply couldn't make a reel big enough to hold an hour's worth of tape.

But there's another way of getting a lot of signal onto a reasonable length of tape—use wider tape and let the head revolve at a high speed. Thus came the helical scan system presently used on most of today's so-called home models. They use half-inch or one-inch-wide tape at the much more reasonable speeds of 12, 9½ or even 7½ ips, permitting up to an hour's worth of uninterrupted recording per seven-inch reel. To achieve a quality picture, however, these recorders use one or more heads rotating at high speed inside a drum. As the heads rotate, the tape traces a path around the outside of the drum (the tape path, in fact, looks something like the Greek letter omega— ω) and the heads trace a slant pattern across it. This method of recording is referred to by some as slant track VTR.

Q. You mention two or more tape speeds and two or more tape widths. Is there no standardization in home videotape?

A. Not in the same sense as with audio recorders. At last count, there were two popular widths of video tape for low-cost VTR's and three tape speeds. No half-inch tape may be played on a one-inch machine (and vice versa). So far, all but one of today's HVTRs are single-speed units, making it impossible to play a tape recorded at 12 ips on a machine which records at 7½ ips. It seems possible however, that multi-speed machines may appear in the future. However, it is doubtful that a multi-speed machine could solve the problem of compatibility.

Nor is there complete compatibility within a tape type or speed. All one-inch Ampexes will play back tapes made on all other one-inch Ampexes. Sony's 2000 series and General Electric machines are more or less compatible with each other since GE uses a Sony transport; and most Concord and Panasonic models are interchangeable. (Both are made by Matsushita Electric in Japan.) Otherwise, you have to play the tape back on the same machine which recorded it, or at least a machine of the same type. The size of the head, the path the tape travels, the speed at which the revolving head rotates are all problems which must be resolved before standardization can be achieved.

Q. Why can't the industry agree on a standard?

A. Each manufacturer believes in his own system. Most manufacturers agree that the consumer

“On most recorders, operation is simply a matter of threading the tape.”

will finally establish the standard by buying one machine and rejecting another. At the moment, if a school buys one Sony 2010, it must complete its system with Sony 2000 series if it wants compatibility. Besides the problems of tape speed, head size, tape path, etc. mentioned above, Ampex is firmly committed to one-inch wide tape for color recording. Sony, however, has demonstrated color on half-inch tape and Newell has demonstrated color on quarter inch tape.

Q. How good is the picture from any videotape recorder?

A. Most are pretty good. As most viewers know, the TV picture is made up of a number of tiny lines—525 to be exact—drawn horizontally across the face of the picture tube. In theory, the greater the number of lines, the better the picture. That's why pictures on small screens look better than those on large screens, particularly when you're watching both only a few feet away. While all of the recorders now on the market operate on the 525-line system, Sony only scans half the lines. Needless to say, not all machines deliver an equally sharp picture. One way of

measuring picture clarity is by projecting a standard test pattern on a TV screen and actually counting the number of lines visible in it. These lines, the product of both horizontal and vertical tracing by the picture tube, theoretically should equal 525. But they are limited by the frequency response of the entire system—camera, recorder and TV set. The higher the resolution (or line count), the clearer the picture. Another guide is frequency response or bandwidth, of the visual system. In theory, each megacycle of bandwidth should equal 100 lines of resolution. Resolution generally is related to price. For good color reproduction you need a 4.3 megacycle bandwidth.

Q. How complicated is it to operate a video recorder?

A. As a matter of fact, most of the videotape recorders now on the market require only that you know how to thread the machine, how to set volume and video levels, and how to focus a camera in order to make acceptable videotapes. On most recorders, operation is simply a matter of threading the tape, setting levels and pushing the clearly marked pushbutton or lever to start, stop,



Panasonic's new model NVA-600 Color Adaptor converts the NV-204 one-inch tape VTR for recording broadcast color television. The unit, which plugs into a connector on the NV-204, will permit the VTR to play pre-recorded color tapes which can be viewed on any color television equipped with an RF converter. A second color adaptor (not shown) the NVA-601 provides the same function with Panasonic's 1/2-inch TVR's, the NV-8000 and the NV-8100.

VTR: Buy Now or Wait . . .

record or play back.

Q. Can you edit videotape the same way you edit sound recordings?

A. Most home videocorders permit mechanical editing of tape—i.e. physically cutting and resplicing the tape. Generally this results in a blip or several seconds of picture roll while the recorder tries to get the picture back in synch. The actual job is only slightly more difficult than editing audio tape. However, the beauty of videotape is that you can monitor while you're recording. If you don't like the results, you simply do a retake on the spot. Therefore the need for editing becomes greatly reduced. We advise against attempting to edit helical scan videotapes at all.

Q. How often does a video recorder need service, and how easy is it to get?

A. Ampex now has a nationwide service organization for its recorders. Companies such as Sony, Concord, Panasonic and others have factory-operated service centers in key cities, plus authorized locally-owned service centers in smaller communities. Actually, video recorders need little more servicing than do audio recorders—provided you keep them clean and change the heads as they wear out. Head replacement, incidentally, is very

much easier than with most audio recorders; and for most models doesn't require the aid of a serviceman.

Q. Can you exchange videotapes, or correspond by videotape?

A. Yes, provided that you and your correspondent own the same brand and model of recorder and that you're prepared to invest as much as \$40 in a videotaped letter lasting 60 minutes (there's also the cost of mailing a videotape, which is substantially higher than mailing an ordinary audio tape).

Q. How long does the tape last?

A. Nobody has run conclusive tests on tape life with various HVTR models. It is clear that videotape wears out faster than audio tape, and the current rule of thumb is a combination of 500 recordings and playbacks on the same length of tape. As the tape is used over and over again, the friction between it and the fast-moving heads knocks oxide off the tape, eventually resulting in visual blips in the picture. It is expected that long-term development will greatly increase the life expectancy of tape.

Q. What about prerecorded videotape?

A. At the moment, the only prerecorded home



Designed as a training device for education, business, industry and the military, this new Wollensak VTR-150 video tape recorder from 3M Company records and plays back television signals, "live" programs recorded with an accessory camera, or pre-recorded tapes prepared on other VTR-150's.

"We advise against attempting to edit helical scan video tapes at all."

videotape—made for use on the Sony machine—is Audio Fidelity's "Johnny Paycheck," a country and western singer who belts 'em out for about 30 minutes, at a price tag of \$49.95. Videotape owners looking for more substantial fare eventually will be able to choose from film classics by W. C. Fields, Charlie Chaplin, the Marx Brothers and others, or TV documentaries featuring the Bolshoi Ballet, the Boston Symphony, art works of the Louvre, Handel's *Messiah* and possibly com-

plete operas and the lesser-known Broadway musicals. But not now. Not until the industry settles on a standard speed and tape width, and the price of tape becomes more reasonable. "It would cost \$150 to \$200 for a full-length feature movie at the moment. At that price, people would be more likely to rent than to buy," says one program producer. It is, he admits, much cheaper to make your own off the air when you see something you'd like to see again.

Directory of VideoTape Recorders

	Cost	Weight & Size	Video Response	Line Resolution	Tape & Tape Speed	Record Time Per Reel	Tape Cost Per Reel & Hour	Heads	Head Life
Ampex Model 6000 (deck with monitor)	\$1,295	105 lbs. 29 3/4" x 20 1/4" x 13 3/4"	2.5 mc	250	1" x 1 mil mylar on 9 3/4" reel 9.6 ips	60 min.	\$60 \$60	1	500 hours
Model 6275 (complete system— includes camera)	\$1,495	118 lbs. 29 3/4" x 20 1/4" x 13 3/4"	2.5 mc	250	1" x 1 mil mylar on 9 3/4" reel 9.6 ips	60 min.	\$60 \$60	1	500 hours
Concord Model VTR 500 (complete system— includes camera)	\$1,500	48 lbs. 10 x 17 x 17"	2 mc	220	1/2" x 1/2 mil mylar on 7" reel—12 ips.	60 min.	\$40 \$40	2	500 hours
Model VTR 600 (complete system— includes camera)	\$1,610	52 lb. 10 x 17 x 16 1/2"	2.5 mc	250+	1/2" x 1/2 mil mylar on 7" reel—12 ips.	60 min.	\$40 \$40	2	1000 hours
General Electric Model VC 941 (deck with monitor)	\$1,250	70 lbs. 10 1/2" x 18 1/2" x 16 3/4"	—	200+	1/2" x 1/2 mil mylar on 7" reel—7 1/2 ips.	60 min.	—	2	—
Panasonic Model NV 7000 (complete system— includes camera)	\$1,600	54 1/2 lbs. 16 3/4" x 9 7/16" x 16 3/4"	5 mc	200+	1/2" x 1/2 mil mylar on 7" reel—12 ips.	60 min.	\$40 \$40	2	1000 hours
Shibaden Model SV 700 (deck with monitor)	\$1,295	66 lbs. 15 3/4" x 9 1/2" x 15 3/4"	3 mc	300	1/2" x 1/2 mil mylar on 7" reel—7 1/2 ips.	60 min.	\$40 \$40	2	1000 hours
Sony Model TCV 2010 (complete system— includes camera)	\$995	60 lbs. 27 1/2" x 11" x 16 1/2"	—	200+	1/2" x 1/2 mil mylar on 7" reel—7 1/2 ips.	60 min.	\$40 \$40	2	500 hours
Sony TCV 2020	\$1,150	28 3/8" x 16 3/4" x 11 1/4"	—	200+	1/2" x 1/2 mil mylar on 7" reel—7 1/2 ips.	60 min.	\$40 \$40	2	500 hours
Model SU 300 (deck)	\$1,250	45 lbs. 19 3/4" x 9 7/8" x 15 1/4"	1.7 mc	180	1/2" x 1/2 mil mylar on 7" reel—7 1/2 ips.	60 min.	\$40 \$40	2	500 hours
Model CV 2000D (deck)	\$730	42 1/2 lbs. 19 3/4" x 9 7/8" x 15 1/4"	—	200+	1/2" x 1/2 mil mylar on 7" reel—7 1/2 ips.	60 min.	\$40 \$40	2	500 hours
Wollensak Model VTR-150 (deck)	\$1,495	50 lbs. 14 x 20 x 9"	2 mc	—	1/2" x 1/2 mil mylar on 7" reel—7 1/2 ips.	60 min.	—	3	1000 hours

**If you know everything
there is to know about the new
high fidelity components, about
decorating with music and
about musicology, stay out of
New York September 21, 22, 23, 24
and don't go anywhere near
Los Angeles November 2, 3, 4, 5.**

The 1967 IHF Shows will be in those cities on those days. And never before have so many experts been gathered to give so many talks about so many subjects related to music in the home.

Unless you know it all, there's sure to be something new you can find out at the biggest IHF High Fidelity Music Shows of all.

**1967 New York
High Fidelity Music Show**

Sept. 21—3:30 PM—10:00 PM
Sept. 22—3:30 PM—10:00 PM
Sept. 23—Noon—10:00 PM
Sept. 24—Noon—6:00 PM

**1967 Los Angeles
High Fidelity Music Show**

Nov. 2—4:00 PM—10:30 PM
Nov. 3—4:00 PM—10:30 PM
Nov. 4—Noon—10:30 PM
Nov. 5—Noon—6:00 PM

Schedule of N.Y. Show Seminar Events—Keep It Handy!

Los Angeles Seminar Schedule to be announced.

Thurs., Sept. 21, 6:30-7:30 PM—Novice Symposium—"Introduction to Hi-Fi Components" . . . 7:30-8:30 PM—"Tape and Tape Recorders" . . . 8:30-9:30 PM—"The Classical Recording Scene."*

Fri., Sept. 22, 6:30-7:30 PM—Novice Symposium (same as Thurs.) . . . 7:30-8:30 PM—"Cartridges, Turntables, and Changers" . . . 8:30-9:30 PM—Decor Group—Albert Herbert.

Sat., Sept. 23, 2:00-3:00 PM—"The Pop Scene"* . . . 3:00-4:00 PM—"Amplifiers and Tuners" . . . 4:00-5:00 PM—Decor Group—Bill Leonard. . . 6:30-7:30 PM—Novice Symposium (same as Thurs.) . . . 7:30-8:30 PM—"Stereo and the Listener" . . . 8:30-9:30 PM—"The Successful Recordings."*

Sun., Sept. 24, 2:00-3:00 PM—Decor Group—Vladimir Kagan. . . 3:00-4:00 PM—Novice Symposium (Same as Thurs.) . . . 4:00-5:00 PM—"The Jazz Recording Scene."*

*Sponsored by the National Academy of Recording Arts & Sciences (NARAS).

Show Admission: \$2.00. See your high fidelity dealer for special discount tickets.

In New York—Statler Hilton Hotel.

In Los Angeles—Ambassador Hotel.



How To Live With Videotape

by Walter G. Salm



Want consistently good recordings? Keep those heads clean! Videotape equipment is no place to get lazy with routine head-cleaning. Use cotton swabs and manufacturer's recommended head cleaning fluid on all tape-to-metal contact surfaces. Clean heads at least after every five hours of operation; more often when the machine is new.

We've all been reading about home video tape and what a boon it would be for the serious recording hobbyist as well as TV viewers. It all seemed very nice and also very remote and academic until one day we were faced with the prospect of getting 120 pounds of Ampex recorder up three flights of stairs to our apartment. Suddenly the first stark reality of videotape came home—these instruments are heavy! We won't go into the reasons for selecting Ampex over some of its smaller and lighter weight brethren. Suffice it to say, the machine is big.

Unwrapping the VR 6075 reveals a very pretty hand-rubbed walnut cabinet, exactly proportioned to fit nowhere except in the middle of the

dining room table. This is another problem with videotape—where does it fit into the décor and living design of today's functional homes? Obviously, the middle of the dining room table is not the answer and we are now setting up a special area in the entrance foyer for the machine. There's just no other place for it. This will entail running coaxial and audio cables from the tape unit to the major TV viewing area—the color set in the living room.

Any TV set can be used with the garden variety video tape machine. There's just one hitch—the TV set must be modified. As part of the VR 6075 package from Ampex, there is a Motorola table model black-and-white set that has been modified

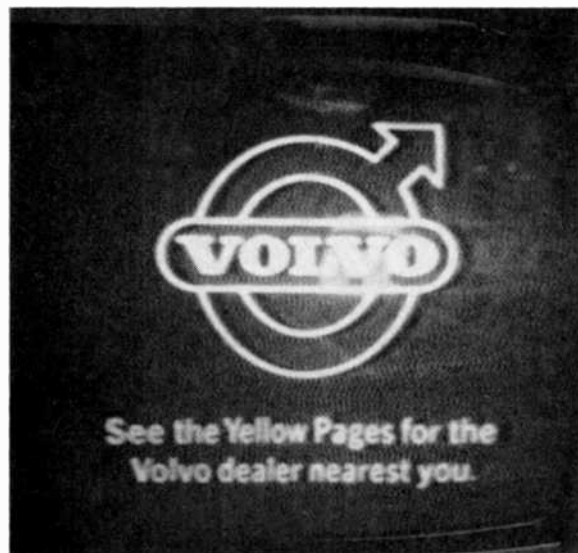
Live with VTR...

just this way. It has the video frequency input and output for a direct connection to the tape recorder. This is fine, but you may want some other kind of TV set in your living room. If you already have a console color receiver, you certainly aren't about to replace it. The modifications necessary aren't really all that hard. Just remember to use shielded cables internally and to connect them to compatible RF type connectors on the back of the set. The audio signal should go through ordinary shielded audio cable such as you would use for the jumpers in an audio tape recorder. If you have any doubts about how to make the connections, consult the diagrams for the TV monitor supplied with the video tape machine, since the takeoff points will be quite similar.

One of the first things you will notice about the video tape in your home is that your TV viewing habits change almost immediately. Even without bothering with such niceties as an electric timer to turn the equipment on for favorite programs while you are away, the machine can drastically affect your leisure hours. It will also likely cause quite a bit of lost sleep.



Connections on the rear of modified Motorola TV set supplied by Ampex are inputs and outputs for both video and audio. Top switch selects normal TV entertainment function or VTR function. Second switch selects matching line impedance for different kinds of connecting cables.



Wavy vertical interference lines on TV screens are caused by radiation from VTR's head-rotating motor, and are especially noticeable when a rabbit ears antenna or twin-lead antenna wire is used. Most of this interference can be tuned out with the fine tuning control. Other helpful hints: use coaxial cable for the antenna; get the TV set as far away from the recorder as practical—with possibly some shielding obstructions in between.

It happens this way. A favorite program comes on. Ordinarily you would miss it because of a conflict with another program, or because you are just too busy to watch. Before TV tape, it would end there. You would just miss the program. With a video tape machine, you walk into your video tape control center or room or whatever else you have, tune in the desired program, press a button, and walk away to do whatever is pressing at the moment.

Later on that evening, you would like to watch the program but you still don't have time. At the same time you can't leave the program unviewed, tying up 60 bucks worth of videotape. So when your normal bedtime comes—say it's around 12:30 or 1:00, you plop yourself down in front of the closed-circuit viewer/monitor in your pajamas, and watch your favorite program—losing an hour's sleep in the process.

After a couple of weeks of this, bags under your eyes get to be the order of the day and business associates will start to wonder what kind of double-life you're leading. So it seems apparent that some kind of strict discipline has to be followed with the use of a video tape machine as well as with ordinary TV watching.

Making your own "home movie" type video tape can be a gratifying experience or a very frustrating one, depending on how much of a perfectionist you are. One of the advantages of video tape over home movies is the fact that it can be erased and reused for retaking scenes that didn't turn out well. This can create a degree of perfectionism that will make life difficult for everyone called on to perform for the camera. When it comes to editing video tape, naturally you will stop and think twice about slicing out sections of this expensive material, which would end up on the proverbial cutting room floor.

Where children are concerned, you can make a kind of game of it.



Threading that inch-wide tape doesn't have to be a chore—simply grasp the end with the right hand and pull it through the loading gate, while manually unwinding the feed reel to provide enough slack. Loading and threading can be done in less than 10 seconds with no special skills needed!

Since the tape is reusable, you can avoid this waste, but only at the expense of a lot of frustration and short tempers.

Some experimentation will show that it is better to try several dry run rehearsals, taping each session and then erasing until the entire sequence is correct. Where children are involved, you can make a kind of game out of it letting them feel that they are on real commercial television and performing for an audience of millions of viewers.

One item that does not come with the original equipment is a microphone, although most video tape machines and manufacturers will supply a microphone of their own choosing—generally at a higher price than it would get on the outside market. Almost any high-impedance microphone will work with a standard video tape recorder, and for best results should be plugged directly into the machine. In some cases, as with the Ampex, an additional receptacle for the microphone is provided right in the camera itself and a separate microphone cable will carry the microphone signal.

There are several schools of thought where TV cameras are concerned. The medium-priced Ampex camera contains an optical viewer, a microphone jack and remote control start and stop

buttons for the recorder. These conveniences are very attractive but have the effect of pricing the camera at \$550. The Sony camera retails for \$350 and has a few less features which in no way affect picture quality. Conar has a video camera kit which may be purchased for about \$200.

Almost any of the new breed of low-cost cameras can be used with this and other video recorders. All that is required is that they have a video output—not just the RF output that some cameras have. There are also problems with special-purpose cameras such as the Ampex when it comes to straight closed-circuit TV use, since its multi-conductor plug must be attached to the recorder itself.

You will probably find the bulk of recording time is off the air for delayed viewing of TV programs, so a few notes of caution. For one thing, the magnetic field radiated by a TV recorder in operation can cause serious interference with a television broadcast, especially if the TV receiver is very near the recorder. A lot of this interference can be tuned out with the TV set's fine tuning control, but there will still remain a pattern of wavy vertical lines, especially on the lower channels. This spurious radiation will also effect other TV sets in the immediate vicinity, especially the ones using rabbit ears or flat ribbon antenna lead-in wire. The only solution to this problem is to use shielded coaxial antenna cable lead-in and appropriate matching transformers at the TV set and at the antenna. By the way, using coaxial line of this type is recommended more and more for optimum performance in home TV sets, especially for color.

One aspect of TV recorder operation that can't be emphasized enough—clean the heads and all tape-to-metal contact surfaces frequently. Ampex recommends every two to five hours of recording or playback time during the early life of the machine. Later on, presumably, the cleaning does not have to be done quite so often.

If you have decided to go the route and buy a video tape recorder, you are probably wondering why it is so expensive. The simple fact is that even low-cost video tape machines today have an awful lot of sophisticated equipment and circuitry. Presumably, as the technology advances, prices will come down. This was certainly the case with audio recorders and will probably be the case with video as well.

In the meantime, if you have a TV recorder or plan to get one, don't think that it's just going to sit in the corner and be an obedient servant. Unfortunately, it's very easy to become addicted to this machine. Your purchase will be the beginning of a period of loving and abject slavery for you, with chains made of oxide-coated polyester ribbon.

ABC's of VTR



Camera and monitor adjustments are carefully reviewed by Ampex Video Institute student during video taping session. Work in the studio is closely linked with classroom instruction at AVI workshop.

The introduction in 1966 of portable closed circuit videotape recorders in the \$1,000 to \$3,000 price range created a broad new market for the once high-priced "instant replay" devices.

Schools, businesses, hospitals and even a few home movie enthusiasts bought these new recorders by the thousands and put them to work in a wide variety of applications. Today, more and more potential users are becoming aware of videotape recording and how it may benefit them. As a result, sales of videotape recorders continue to climb.

Videotape recorders, along with the cameras and monitors necessary for producing video tapes,

are relatively easy to operate. There is, however, a technique involved in producing professional quality video tapes that must be learned. Some degree of semi-technical training is necessary for regular users of videotape recording to get the most out of this new communication medium.

Recognizing the need for a continuing educational program, Ampex Corporation's consumer and educational products division established the Ampex Video Institute (AVI) at its plant in Elk Grove Village (suburban Chicago), Illinois, in 1966.

AVI offers a five-day course in the fundamentals of closed circuit television with the emphasis on

Some degree of semi-technical training is necessary.

videotape recording. It is open to everyone. Tuition is \$100 to purchasers of Ampex videotape recorders and an additional \$50 to persons not owning Ampex videotape recorders.

The school naturally emphasizes Ampex VR-7000 and VR-6000 videotape recorders, plus Ampex cameras and monitors, but is broad enough in concept to offer non-owners of Ampex video equipment an objective five-day education in closed circuit television.

Class sizes are kept small to give every student a chance to practice with all kinds of CCTV equipment. But much more than practical experience is involved in the CCTV course. Lectures, tests, demonstration and discussions also are included. The total course covers camera techniques, lenses, angles of lighting and framing, staging practices, studio lighting, microphone techniques, film and slide projectors, multiplexers, dubbing and care and handling of tape. The videotape recorder is the focal point of the instruction and its oper-

ational techniques and uses are taught in depth.

A loose-leaf manual and texts, issued by the AVI, require study beyond the seven hours a day spent in the classes. The manual and texts, along with a student's own notes, furnish a permanent reference source for operation of a CCTV recording system.

Students are given ample opportunity to work with the equipment as part of the class sessions. Lessons include the production of a video tape—including preparation of the script, setting up the lighting, determining camera angles, and operating the videotape recorder and associated equipment. Once the script is ready—usually it deals with a routine maintenance function on a videotape recorder—student talent acts out the demonstration while other students do the lecturing and operate the equipment.

The demonstration program is taped and played back instantly with both students and instructors critiquing the script, lighting, camera



"How To Clean a Video Head" is the subject of this video tape production at the Ampex Video Institute in Elk Grove Village, Ill. Students produce video tapes, replay them immediately for critiquing, and then reshoot the presentation. Scripts are provided by AVI, but students act out the script and work all equipment.

ABC's of VTR...



At the console: Ampex Video Institute students are trained in basic techniques of control room operation as well as to work with videotape recorders, cameras and lighting in the studio.

placement, and recording techniques. Once the critique is complete the demonstration is taped again.

AVI is taught in specially built classrooms and studios equipped with Ampex videotape recorders, cameras and monitors plus a fully equipped studio control room.

The course ends with a tour of the Ampex video manufacturing plant where students see the recorders and cameras being made, tested and packaged.

Chief instructor at the AVI is James Crooks. Director of the Ampex Video Institute is Robert Dressler.

AVI also offers a five-day service training school

for distributors, dealers and contract personnel who must maintain the equipment.

During its first nine months of operation, AVI has had over 1,000 graduates from its CCTV and service schools.

CCTV school graduates include college and university administrators and technicians, business and industry personnel, hospital and medical center staff people, police department officials, dealer personnel, and federal and state government representatives.

The CCTV course has been so successful that the company is planning an advanced course for those who want more technical videotape production training.

tape

REVIEWS

Mahler

Symphony No. 8. Erna Spoorenberg, Gwyneth Jones, Gwyneth Annear, Anna Reynolds, Norma Procter, John Mitchinson, Vladimir Ruzdjak, Donald McIntyre. Leeds Festival Chorus, London Symphony Orchestra Chorus, Orpington Junior Singers, Highgate School Boy's Choir, Finchley Children's Music Group. London Symphony Orchestra, Leonard Bernstein, conductor. Columbia M2Q876, 7½ ips, \$11.95.

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

Frequently called the "Symphony of a Thousand," because of the 1,000 performers called for in the score, this monumental work of the mature Mahler is more a choral work than a symphony. Certainly the nearly 900 voices are overpowering when drawn alongside a mere giant-size symphony orchestra. And the symphony's structure is an awesome one, drawn on an enormous canvas in the bright, strong colors of a man who was thoroughly the master of his craft.

Mahler's works in the 20th-Century's first decade (also the last decade of his life) were larger than life in many respects. Tape-ophiles unfamiliar with this German romantic's output might balk at the symphony's length and repetitive nature during the final section—but it never loses its promise of vastness, power and chained excitement.

The 8th Symphony has a noble history, premiering under the composer's baton to universal accolades in 1910, its singers hand-picked and coached by none other than Bruno Walter. Gustav Mahler died only eight months after this premiere, without having heard performances of his farewell trilogy—the 9th and 10th Symphonies and *Das Lied von der Erde*.

Leonard Bernstein and his thousand performers are more than equal to the occasion in this tape, producing a recording that will stand as a fitting monument to Mahler's greatness. The performers all seem to have been caught up in the magic of the Mahler epic, and may well have produced the finest and most definite stereo recording of the Eighth yet to come from the concert hall. Bruno Walter, of course, had the inside track to Mahler's music, and Bernstein may possibly never be Walter's equal, but the baton of greatness seems to have been passed between the two. —W. G. S.



Tchaikovsky

Sleeping Beauty Ballet Suite and Romeo and Juliet. Eugene Ormandy, conducting the Philadelphia Orchestra. Columbia MQ 877, 7½ ips, \$7.95.

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

Conball they may be to some—these two old timers on an extra-length tape—but somehow the serious and casual listener alike never seems to tire of Tchaikovsky, especially in an impeccable performance by the Philadelphians and a flawless recording. Tchaikovsky had a special kind of scorn reserved for his own music—particularly his ballet works. Fortunately for the music-loving public, he was just egotist enough and just impecunious enough to allow these works to be published. Musical sophisticates may likewise scorn all of this Russian master's works as being too sentimental, lowbrow and schmaltzy. Schmaltzy they may be, but no worthwhile collection of serious music can afford to be without them, and this tape will be an important addition to the basic library. —W. G. S.

Richard Strauss

Four Last Songs. Elisabeth Schwarzkopf, with George Szell conducting the Berlin Radio Symphony Orchestra. *Frühling, September, Beim Schlafengehen, Im Abendrot, Muttertändelei, Waldseligkeit, Eueignung, Freundliche Vision and Die heiligen drei Könige.* Angel ZS 36347, 7½ ips, \$7.98.

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

While the four last songs may not have

been conceived and written at the same time, through time-honored practice, they are performed together as they are here. These, coupled with five other *lieder* and the sensitive reading by Elisabeth Schwarzkopf provide a recording that may very well be a definitive one. The five accompanying songs span the period from 1882 to 1906—representing two decades of Strauss' musical development. The four last songs were in a way the composer's own epitaph or swan song if you will—they were composed in the late 1940's with his impending death only a shadow away, and show a preoccupation with death in various metaphors. *Lieder* and opera buffs alike will find this release both appealing and highly worthwhile. —W. G. S.

Verdi

Un Ballo in Maschera. Leontyne Price, Carlo Bergonzi, Robert Merrill, Shirley Verrett, Reri Grist, Ezio Flagello, Ferruccio Mazzoli, Piero de Palma, Fernando Jacopucci, Mario Basiola, Jr.; RCA Italiana Opera Orchestra and Chorus; Erich Leinsdorf, conductor. RCA, TR3-8002, 3-¾ ips; \$17.95.

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

It's always good news when an all-star cast such as this gets together for a major recording session. And perhaps it's a sign of the times that RCA saw fit to squeeze the entire opera on a single 7-inch high-torque (large hub) reel. Even at the 3-¾ ips speed, that's no mean feat—yet the print-through we might normally expect from using thin, extra-play tape is noticeably absent.

The opera itself is one that's been beset by contrary opinions about its staging ever since the revolutionary ferment that surrounded its premiere performance in 1858. Audiences and monarchs were awfully thin-skinned in that era—taking nearly everything as personal insults. Thus we have three different stagings for this opera today, and, this newest recording uses the Boston/New England Puritan locale, presumably not to offend any of the Italian members of the cast.

The soloists in this release are in glorious voice; the orchestra and chorus—all turn in scintillating performances under Leinsdorf's masterful direction. We may hear some opinions to the contrary, but at least to this reviewer, Erich Leinsdorf's

Tape Reviews

baton is made of pure musical gold. He is one of the truly great conductors of our time, and notwithstanding, the listener can invariably expect to hear the absolute pinnacle of human achievement.

Mr. Leinsdorf's choice of soloists is an especially apt one. Certainly any maestro would be hard put to match the combined vocal forces of Price, Bergonzi and Merrill all in one package. And shaped to the ultimate musicianship of Leinsdorf, the Verdi idiom comes off as a masterful *tour de force*.

The slow-speed recording does not noticeably effect fidelity or signal-to-noise ratio. However, there is a problem with frequent signal dropout, possibly made the more apparent by the slow tape speed. Similar dropouts taken at 7-1/2 ips would be shorter and less distracting from the music.

Another difficulty: the single-reel packaging, while admirable from the user storage viewpoint, left little room (actually no room at all) in the box for a libretto, so none was included. Instead, inside the box is a post card which presumably will bring a libretto in the mail within a couple of weeks—exactly a couple of weeks after the purchaser would first like to have one. It would seem very feasible for RCA to attach the libretto to the outside of the box, wrapping the whole thing in that ever-present heat-sealed plastic wrap film that surrounds all new tape boxes.

Yet, these objections pale into near insignificance next to this monumental performance. The Leinsdorf magic is here once again for all to hear and to breathe, "This is it, the heart and soul of the opera."
—W.G.S.

Rubinstein

Chopin. Includes *Waltzes Nos. 1-14; Fantasia in F Minor Op. 49; Barcarolle; 3 Nouvelles Etudes; Berceuse; Tarentelle; Artur Rubinstein, piano. RCA TR3-5013, 3-3/4 ips, \$10.95.*

Music Performance	★★★★
Recording	★★★

Chopin seems almost synonymous with the name of Artur Rubinstein, this foremost Chopin proponent and interpreter whose readings are universally called "definitive." Of course, a pianist of Rubinstein's stature has little fear of criticism at this point in his career, and rightly so. Those who have had the privilege of hearing this supreme keyboard master in per-

son know the electric atmosphere of his piano, and the strange mesmerizing power that he has over listeners. For Rubinstein is the pianist extraordinary—the one name that perennially comes to mind as the definitive one for not only Chopin, but many other composers as well.

It's certainly appropriate that RCA saw fit to couple two complete Chopin albums in this double-length tape. The first sequence is devoted entirely to the waltzes, while the second is given over to the other, less-familiar works. Even with the many Rubinstein recordings of Chopin that have been made, this tape contains two first recorded performances by the pianist—the *Bolero* and *Tarentelle*. Again, even though the works may be unfamiliar to us, we can rely on Rubinstein's definitive touch with Chopin.

The slow-speed format used here is an especially happy one for an all Chopin/Rubinstein program. Single-length recordings of this type of music almost always seem to end too soon, and here we have a full-length concert! There seems to be little if any degradation of the sound quality from the 3-3/4 ips speed, but there is a jarring tendency to overmodulate and therefore produce distortion on some of the *fortissimos*. Even so, this is a top-notch release by the finest living pianist, and well worth adding to your tape library.
—W.G.S.

Ray Charles Singers

What The World Needs Now Is Love. Includes *Open a New Window, Strangers In The Night, I'll Walk Alone, Don't Cry and others. Command CMX 903, 3 3/4 ips, \$5.95.*

Music Performance	★★★★
Recording	★★★

A rather sleepy, dreamy-eyed reading of some very pretty and well-loved favorites, done quite well by this top-notch vocal group. Songs include "I Understand," "I'll Walk Alone," and "Strangers in the Night." For pure melodic and harmonic platitudes, this tape is perhaps unexcelled. The all-pervading tenderness of each selection and its sensitive interpretation communicates a kind of love and quiet joy to the listener. This Ampex release is certainly agreeable to listen to and is best classified as mood music.
—K. S.

Floyd Cramer

Class of '66 and The Best of Floyd Cramer. Includes *Strangers in the Night, Love Letters, When a Man Loves a Woman, Spanish Flea, Last Date, Unchained Melody, San Antonio Rose and others. RCA TP3-5018, 3 3/4 ips, \$9.95.*

Music Performance	★★★★
Recording	★★★

The music forms a Floyd Cramer chronology, including some of his greatest tunes. He provides a kaleidoscope of striking piano instrumentals that range from the quietly sentimental to the heavy-handed dance beat. His renditions are always in good taste and varied enough to sustain the hearer's interest. This is a background and mild party type of tape, with plenty of variety in its double-length format. The tears are there, along with the laughter—an excellent all-around job.
—W. G. S.

Trini Lopez

Greatest Hits! Including If I Had a Hammer, Sinner Man, Michelle, LaBamba and others. Reprise RS 6226, 7 1/2 ips, \$7.95.

Music Performance	★★★★
Recording	★★★

You can't exactly call him a folk singer, even though Trini Lopez communicates a folksy, informal "feel" that he has for his music. The songs selected for this tape are especially suitable for Lopez' style which is at once noisy, unruly, disciplined (when it's called for), highly original and unoriginal. He's a musician of many facets, all of them highly capable, and the seeming contradictions in his approach all combine to form his style. He leans heavily on gimmicked guitars and rhythm and close-in microphone work. He's good. Better than that, he's great!
—W. G. S.

Les and Larry Elgart

Warm and Sensuous. *Les and Larry Elgart Orchestra, Larry Elgart, saxophone. Just Friends, Here's that Rainy Day, Bermuda Concerto, Harlem Nocturne and seven others. Columbia CQ 881, 7 1/2 ips, \$7.95.*

Music Performance	★★★★
Recording	★★★

It's an unfortunate sign of the times we live in, but just about anything that we old-time squares always loved as dance music has been shelved with the label, "Mood and Background." These days, dance music must be loud, gyrating, fast and raucous, played by a small combo of teenagers who need haircuts. The girls squeal and faint while the rest of us sit and watch in bemused wonderment.

The Elgarts belong in a fine hotel ballroom (a fast-disappearing institution, alas) or on a luxury ocean liner (also a disappearing commodity). They're darned good, and if you have a crowd that dances anything besides the monkey and watusi, this tape has something for them. The music is sweet and lush, with a great dance beat (for slow old-timers like this reviewer). More like this please, Mr. tape arranger, and a little less from the hairy lunatic fringe! —W. G. S.

Jackie Gleason

A Taste of Brass. Jackie Gleason and his orchestra play *African Waltz, A Taste of Honey, Mame, Love is Here to Stay, It All Depends on You*, and five others. Charlie Ventura is featured on tenor and bass sax with Roy Eldridge on the trumpet. Capitol Y1W2684. 3¾ ips, \$6.98.

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

Television's funny man is dead serious when he leads his orchestra. Typically, Gleason has programmed familiar, unobtrusive numbers performed in a not-too-imaginative, unobtrusive style. The featured brass gives the tape a flavor of the Golden 40's Big Band Sound, or perhaps the treatment you'd expect to hear at the Casa Loma. The tape's good for low-level or background music. It certainly won't set any of today's parties on fire, but can be an excellent standby for your mood music library. While Gleason is certainly vastly better than about 95% of today's music (?) producing groups, he's hanging too tenaciously onto a style that evokes more nostalgia than anything else. —W. G. S.

El Trio Los Panchos

Romantic Guitars. Includes, *Adios, Perdon, Margie, Advertencia, etc.* Columbia 14 10 0232, four-track cartridge, \$5.95.

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

Here is a treat for Latin music lovers, by a long-time-favorite group who both sing and play guitars. The singing is great. So is the guitar work, with many short solo passages. The nature of the songs—some languid, some romantic—is conducive to relaxed listening at home, or non-obtrusive listening in the automobile.

This is the kind of music ideal for highway listening in that the sound level is reasonably constant, eliminating the need to fiddle with the volume control to increase quiet passages or to lessen the impact of fortissimos. —F.P.

Peter Nero

Peter Nero Plays A Salute To Herb Alpert and The Tijuana Brass. Peter Nero Xochimilco. Including: (Side One) *Spanish Flea, Tijuana Taxi, Work Song.* Including: (Side Two) *Xochimilco, Michelle, Mame, Winchester Cathedral, RCA Victor TP3 5028, 3¾, \$9.95.*

SIDE ONE

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

SIDE TWO

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

A mammoth deception perpetrated by large record companies with the record buyer in mind, is to have their stable of artists simulate or salute such pop clicks of the moment as Herb Alpert's Tijuana Brass. The first few albums of Mr. Nero showed his vast imagination compounded with his considerable classical background, for which he gave pop standards a new flavor, but this current offering is nothing more than a vulture perched on the hipbone of a dying bull. On the other hand NOCHIMILCO pronounced (SO-CHEE-MEEL-CO) is an interesting original composition by Peter, written to honor the 1968 Olympics to be held in Mexico. The remainder of the album is made up of current hits styled somewhat like his first album *Piano Forte*. A double feature stereo tape that will please music appreciators and Nerophiles alike. —F.R.

Glen Campbell

Glen Campbell—Burning Bridges. Including: *Burning Bridges, Faith, Together Again, I'll Hold You In My Heart, Capitol Y 1T2579, 3¾, \$6.98.*

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ROBERT F. HERROLD, III
Microphone Project Engineer

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During development of the new Electro-Voice Model RE-15 Super Cardioid, it was determined that a cardioid microphone with optimum rejection at 180° off axis could maintain this rejection only within a cone of about 15° to 20°. This meant that the microphone had to be aimed directly away from the offending noise for maximum effectiveness.

The design of the RE-15 was altered to permit a small lobe to exist at 180° (still providing at least 15 dB of cancellation). This placed the point of maximum rejection at 150° off axis, and increased the useful cone of rejection to about 80°.

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The Model RE-15 design is a blend of the concept* used in the Model 666 Variable-D_B microphone and the Model 676 Continuously Variable-D_B models. In essence, fixed cancellation ports are provided close to the diaphragm for frequencies above 1000 Hz, while a slotted line provides a variable distance port for cancellation of frequencies below 1000 Hz.

As a result of this design the RE-15 offers unusually uniform frequency response at all points of the polar pattern within its useful frequency range. Frequency response at 90° and 180° off axis is within ±2 dB of on-axis response. Thus there is no change in sound character as a performer moves off axis—just a change in sound level.

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Tape Reviews

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

Glen Campbell has built a very sturdy bridge between country and popular music. He is able to pass over in either direction and make each visit seem like his first. There's a touch of stardom in this man's voice. There are sturdy handsome features in his face which suggest a career on the stage or in films. He presents the country sides on this stereo tape in a manner that even a hard-core Tex Ritter fan couldn't help but listen to at least twice. That's saying much!!! —F.R.

Love

Da Capo. Includes *Orange Skies, Que Pasa, The Castle, She Comes in Colors, Revelation* and several others. Elektra EKX 4005, \$5.95.

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

Love is a group of seven young men who sport long hair and belong to what might be considered the acid-rock school of music. If this tape should be your introduction to this form of rock, lucky for you. Love swings pretty good.

Playing all their own original material, this group offers some very groovy material. Particularly good is *She Comes in Colors*. Side two of this tape is called *Revelation* and it runs almost 19 minutes long. You'll hear some new sounds—and some interesting ones. This tape is definitely worth more than a casual listen. After all, we can reasonably expect that Love will be with us for a long time to come. —R.E.

The Blues Project

The Blues Project. Includes *Fixin to Die, Blow Whistle Blow, My Little Woman, Ginger Man, Bad Dream Blues, Winding Boy, I'm Troubled, France Blues* and eight more. Elektra EKX 7264, \$5.95.

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

Blues has become "old fashioned" and most of the great Negro blues singers of the past are either gone or past their prime. Now this protest music has been picked up by a young group calling it-

self the Blues Project. The form may be old fashioned and the singers may be white but the sound is authentic and the feeling comes across.

The Blues Project offers here a group of originals that should appeal to blues fans. To this reviewer they have as much appeal as any blues group currently making the scene. —R.E.

Jim Nabors

Jim Nabors Sings. Includes *Love Me With All Your Heart, You're Gonna Hear From Me, You Don't Know Me, Somewhere My Love, Rock-A-Bye Your Baby, Strangers in the Night, The Impossible Dream, On A Clear Day, Swanee, I'm Yours, What Now My Love.* Columbia CQ 898 \$7.95.

Music	★★
Performance	★★
Recording	★★

To his television fans who've enjoyed Jim Nabors on the Gomer Pyle TV series, this tape will show another facet of Nabor's talents. A great singer, he's not. However, he's surprising in that he turns out to be better than one might expect. He has a big voice and a pleasant one with a nice, straightforward style completely devoid of gimmickry or pretense. The selections are pretty good. Overall, a smooth performance by a not-quite professional vocalist who shows signs of improving. —R.E.

Ace Cannon

The Misty Sax of Ace Cannon. Includes *When A Man Loves A Woman, Summer-time, Wonderland By Night, As Time Goes By, You'll Never Walk Alone, Strangers in the Night, Blowing in the Wind, Somewhere My Love, Yesterday, Michelle and Almost Persuaded.* Hi Records H1X 52035, \$5.95.

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

Ace Cannon is a saxophone virtuoso who turns his instrument into pure sex on this tape. If you like dancing close with all the lights out—this one is for you. If you simply enjoy listening to a great saxophone, this tape is for you. It's got a jumbo size helping of recent hits—all well arranged. A word of caution for the casual listener. Because Ace Cannon is featured on every number and because his saxophone is so prominent, you may

find a solid half hour of sax solos, even though backed by an orchestra with strings more than you can handle. Try to listen to only one half or less of the tape at each sitting. But be forewarned: this is very sexy music! —R.E.

Nina Simone

Wild is the Wind. Includes *I Love Your Lovin' Ways, Four Women, Wild is the Wind, Black is the Color of My True Love's Hair, If I Should Lose You, That's All I Ask, Lilac Wine, What More Can I Say* and others. Philips PTX 600 207, \$5.95.

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

Nina Simone's artistry extends far beyond her capabilities as a singer. She's a great vocalist: wide ranged, flexible, experimental and controlled. Her musical talents include composing and arranging. She's rightly considered a jazz artist but she's also an all around entertainer.

This tape displays amply Nina Simone's full range of talents. To fully appreciate Miss Simone requires attention on the part of the listener. There is great variety in each of her performances—and some may be difficult to enjoy at first because some of her work is quite complex. She's well worth the effort. Particularly commended in this package are *Four Women*, which may help some understand better the causes of Negro rioting and *If I Should Lose You*—an almost forgotten classic. —R.E.

Chet Atkins


It's A Guitar World. Includes *What'd I Say, January in Bombay, Lara's Theme, Taste of Honey, Star-Time, etc.* RCA Victor P8S 1230, 8-track stereo cartridge. \$6.95.

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

Chet Atkins, a long time winner for RCA, continues his string of recorded successes with this addition, in 8-track form. The program mix is interesting, with some intriguing moments, unusual sound effects and instrumental voicing, especially in *January in Bombay* and *Ranjana*.


Some cross-talk was evident in the review copy, but not enough to be annoying.

Good listening for the road or the living room. —F.P.



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Tape Reviews

Village Stompers

A Taste Of Honey. Includes *Second Hand Rose, Wabash Blues, King of the Road, Bird of Bleeker Street, Yesterday, Lover's Concerto, and others.* Epic N18, 10006, 8-track stereo cartridge. \$5.95.

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

The Stompers are an imaginative group, combining tried-and-true Dixieland and Old Tyme stylings with today's rock-and-roll and popular music approaches. The end result is a captivating, listenable "sound." The group plays with verve and vitality. And tongue in check. There are many bright moments.

Crosstalk was obnoxious at a few points, for brief periods, otherwise the sound on the review tape was excellent. F.P.

Webley Edwards

Webley Edwards Presents More Hawaii Calls: Greatest Hits. Includes *Tiny Bubbles, A Song of Old Hawaii, Pagan Love Song, Seven Days In Waikiki, To You, Sweetheart, Aloha.* Capitol Y1T2736, 3 3/4 i.p.s. \$7.95.

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

Those who hover in the canyons of large cities and who are not exposed to quantities of Hawaiian music, may be moved to state it all sounds alike. Well, that's their loss. Webley Edwards, major-domo of the islands, latest Hawaiian musical hukilau sports some of today's best selling sides as well as some oldies offered in traditional style. A very pleasant evening's listening for the seasoned traveler as well as the armchair variety.

The stereo tape that conjures up tropical seas and skies that turn to dusky blue when the night falls like a multicolored blanket of illuminated mist, IS YOURS simply by pushing the play-switch.

—F.R.

Philippine Dance Company

Bayanihan (Philippine Dance Company). Includes *Dances of the Mountain Province, Philippine Panorama, Hari-Raya (Muslim Festival),* Monitor-Ampex MRC428, \$7.95.

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

"Working Together" is the meaning of Bayanihan and this troupe of Philippine dancers do just that in grand style. This tape is a panorama of life and customs set to the native music which each player performs seemingly with great personal love. There are folk tunes of rice growers, street vendors, and sounds of the locusts in the fields. There are dances that dramatize stories of driving away of the evil spirits, boar hunting, and a rice harvest thanksgiving. I could go on and on about this splendid cultural endeavor but instead I'll say purchase this tape and listen for yourself.—F.R.

Johnny Cash

Happiness Is You. Includes *Guess Things Happen That Way, She Came From the Mountains, No One Will Ever Know, A Wound Time Can't Erase.* Columbia CQ 927, \$7.95.

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

From out of the Tennessee Hills one dark and dreary night an old panel truck churning up dust made it's way to the "Big City" loaded down with Johnny Cash's latest sour-mash stereo tape. This country singer with the permanently pained expression is much revered in the deep south and enjoys quite a following of faithful fans. He has given us City-Folk another generous sampling of his special brand of bitter-sweet love tales. Good grief, if life is as these ditties state, how does our civilization survive? But this is just one Cave-dweller's thoughts.—F.R.

Hank Williams & Hank Williams Jr.

Hank Williams & Hank Williams Again. Includes *I'll Be A Bachelor 'Til I Die, Howlin' at the Moon, Kaw-Liga, I'll Never Get Out of This World Alive.* MGM-Ampex STx 4378, \$5.95.

Music Performance	★★
Recording	★★

Every Hank Williams recording it seems, has been issued and re-issued a score of times since his untimely death in 1950. This time the greedy ghouls in the MGM echo chamber have pumped up the old records and talked Hank's son (a nice kid with little voice) for a second time, into singing '67 style against them, with some strings and things added for the stereo buyer. In my opinion all the earthy charm of the fence sitter, guitar strumming, Williams Sr. has been lost for all time.—F.R.

Enoch Light

Enoch Light and the Light Brigade. Includes *Downtown, Forget Domani, Meditation, American Patrol, Alexander's Ragtime Band.* (COMMAND Ampex CMC 915), \$7.95.

Music Performance	★★★
Recording	★★★

The calling card of Enoch Light reads "The Master of Musical Excitement." I'm afraid Mr. Light has spent too much time being exciting and not enough at being the musical innovator he was when struggling through those early years backing long forgotten singers. It's true this tape has songs that are standards, and the sound is the thing but the way these spices are blended the mixture turns out to be a primitive form of mechanical music. For stereo bugs who are bugged by big band bugs bats and bells this Light Brigade offering is a sure bet.—F.R.

Vintage Jazz

From New Orleans to 52nd Street. Includes *Shreveport Stomp, Frankie and Johnny, Maple Leaf Rag, Blue Room, Daybreak Express, Somebody Stole My Gal, China Boy, Nobody's Sweetheart Now, Piano Man, Body and Soul, 52nd Street Theme, Oop-Bop-Sh-Bam, etc.* Various orchestras (see below). RCA Victor, TP3-5026, 3 ¾ i.p.s. MONO. \$9.95.

Music Performance	★★★★
Recording	★★★★

Jazz enthusiasts (and perhaps followers of the "camp" scene) who have been decrying the lack of original-recording jazz in the tape medium will rejoice in this treasure from RCA Victor's archives. The artist roster—Jelly Roll Morton, King Oliver, Sidney Bechet, Count Basie, Duke Ellington, Fats Waller, Benny Goodman, Jack Teagarden, Earl Hines, Coleman Hawkins, Johnny Hodges and Rex Stewart—are all synonymous with great traditional jazz. Dizzy Gillespie and Kenny Clarke represent the "new era" sound of 52nd Street which helped mold much of today's modern jazz.

The liner notes—all too inadequate (like so many on tape albums)—say the recordings cover a 25 year period. Which 25 years, pray tell? But let's not be niggly; there are lots of "encyclopedias" containing such information. Let's hope big sales of this fine effort result in many more such collections in the future.

The sound is remarkably clean, with some of the bassy, three-dimensional quality of good 78's retained in several of the selections.

A must for the serious collector.—F.P.

Glenn Miller

Glenn Miller Time—'65. Includes *Chattanooga Choo Choo, Elmer's Tune, At Last, Pennsylvania 6-5000, Hello, Dolly! Girl from Ipanema, etc.* Epic N18 10014, four-track stereo cartridge.

Music Performance	★★★★
Recording	★★★★

For those seeking the old Glenn Miller sound this set will fill the bill—to some extent. Orchestra leader Ray McKinley and trumpeter Bobby Hackett follow the Glenn Miller styling on six selections—up to a point, then impose their own ideas on the arrangements and the music. The net result is quasi-Miller, pleasant, but just NOF Miller.

The more recent tunes are well done, reflecting what might have been Miller's ideas, a la McKinley. Bobby Hackett plays suavely.

The review tape tended to run slow, taking some of the life out of what might have otherwise been an enjoyable listening experience. We hope consumer copies of this cartridge (also available in eight-track form) run at true speed for optimum results. —F. P.

Harmonicats

Peg O' My Heart. Includes *Twilight Time, Minute Waltz, Mam'selle, Sabre Dance, Malaguena, Tenderly, Deep Purple, Peg O' My Heart, etc.* Columbia 18 10 0204, 8-track stereo cartridge. \$5.95.

Music Performance	★★★★
Recording	★★★

Those old mouth-organ standbys, The Harmonicats, are just as good as they ever were—tops—in this first-rate collection of fine songs (some of them associated with the group for some 20 years)

A nice balance of tempi and moods make this one ideal for road or living room. Listeners with good home hi-fi systems will immediately notice how far 8-track has come in terms of quality sound in less than two years . . . but how it is still niggled by crosstalk. But don't let a little crosstalk deter you from latching on to this set. —F.P.

True Blues Traveling Dance Band

Enoch Light Presents The True Blues Traveling Dance Band. Includes *Sing For Your Supper, Sin To Tell A Lie, Stumbling, Ukelele Talk, Little White Lies, etc.* Project Three, L-76-5009, 8-track stereo cartridge. \$6.95.

Music Performance	★★★★
Recording	★★★

Delightful, spoofy, camp-cornball. . . . For old and young. The arrangements are outrageous, loaded with musical cliches from several eras of popular and jazz music. Kazoos, olde tyme piano, and banjo passages abound, with all sorts of mutes and unusual instruments used for "authentic" period effects. Spoofed also are expressions of the periods.

The sound is well inscribed, totally without cross-talk. A MUST BUY. —F.P.

Most of the cartridge tapes reviewed above are obtainable in four- or eight-track form. In some cases the four-track version will be priced lower, as for example the Project Three group, list-priced at \$6.95 for eight-track, or \$5.98 for four-track.

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

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VTR's Behind Prison Bars

by Gregg Perry



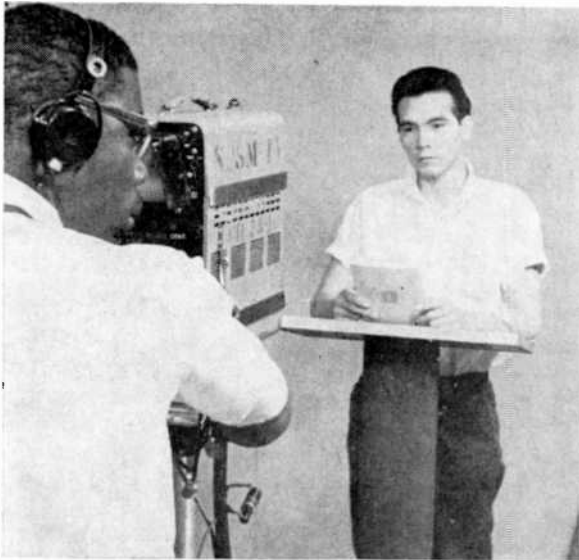
Ampex VR-660 finds flexible applications in the prison television system. Educational programs are taped from telecasts of surrounding stations including university outlets such as Michigan State University in East Lansing. Inside productions are also recorded for playback throughout the Academic School.

Inmates at the State Prison of Southern Michigan are excelling in college studies and passing on their knowledge to hundreds of fellow inmates with the help of videotape recording, television's familiar "instant replay." Because of the wide range of IQs among inmates, prison officials offer a broad educational program in order to offer growth to all students. Relying heavily on its closed circuit television system, Southern Michi-

gan Prison offers programs ranging from showing inmates how to address letters to college level math courses. An important part of the system is an Ampex model VR-660 videotape recorder. With it, Southern Michigan is able to maintain programming for two TV channels operated simultaneously within the prison.

"Because a good deal of time is spent preparing
(Continued on next page)

VTR's Behind Bars . . .

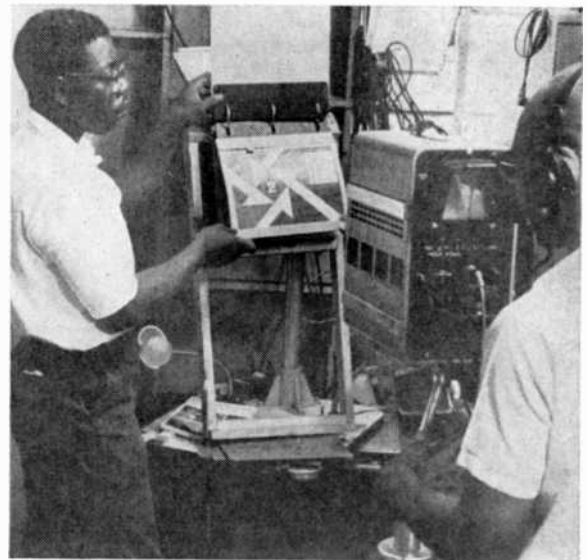


Inmate instructors and crew members prepare and produce educational courses on a wide range of subjects from basic reading to biology over the closed-circuit system. The operation serves as a training area for both ETV teachers and technical/production personnel.

programs, our lessons are carefully considered and put together," says Gerald K. Bates, educational television coordinator at the prison. "We consider our time and effort to be well spent when the lessons can be stored on video tape and played back as many times as necessary. In the meantime, the instructor is freed from duplicating the same lesson. He can then spend his time developing a new lesson."

With a small budget and a minimum of equipment, Southern Michigan is able to provide a wide range of educational programs through extensive, versatile use of its videotape recorder—not only to record prison produced programs for later showing, but to tape and replay programs of value from outside television sources and even counseling sessions. It also assists inmates who are training to become instructor assistants by permitting self-evaluation of their skills. "We have witnessed some inmates advance two full years by national testing norms in a particular subject within a three-month period," adds Bates. Southern Michigan is believed to be the first prison to establish its own television network for education of inmates.

Since about half Southern Michigan's inmates have less than seventh-grade education, officials



A professional touch is added by identifying both channels of telecast as in a commercial outlet. Art work, settings and props are included in the inmates' repertoire of responsibilities to the CCTV operation.

attempt to keep programming in line with student needs. Bates places emphasis on subjects of use to elementary level students. English, history, math, and science material are offered at the high school level, and there has been considerable interest in college level programming both on a credit and non-credit basis from courses offered by Michigan State University which are picked off-the-air from the school's educational channel.

Through programs prepared by inmates, outside citizens help teach men how to get a job, how to fill out income tax forms, how to get the most out of the money they earn, and even how to apply to government and social welfare agencies when they need help.

One of the most successful programs is called "How to Write Letters Home." One reason for its success is that a great many inmates rely on other inmates both to read their incoming mail and write the thoughts they wish to send to their wives and families. The program offers them a chance to escape having to share their most private thoughts with a middleman. It also offers a comparatively simple step to show their relatives and friends that they can change and succeed.

"Because of the wide range of program sources,

Officials attempt to keep programming in line with student needs.

the videotape recorder receives plenty of use," Bates explains. "Programs may be available from outside sources, for example, at 9:30 a.m., but classes which can benefit from the program are not scheduled until the afternoon. It's a simple matter to record it and play it back whenever we like."

Roughly 1800 men have real access to educational television programs and an exploration is being made to provide a more meaningful service to all inmates. Peak attendance for all programs at a given time is about 380. Bates feels that not all of the benefits derive from what's shown on the screen. The equipment and studio facilities are manned by inmates, and much of the electronics were designed and built by inmates. In addition, they maintain and repair all of it, from the prisoner-designed control panel to the VTR itself. Even the art work and props used for programs produced within the prison are the responsibility

of inmates.

The result is that men who might otherwise have trouble learning the skills required for TV servicing, equipment maintenance, even videotape editing and program producing, are getting daily experience in every stage of television program development. One prisoner learns how to operate the CCTV camera; another learns the intricacies of program engineering while a third gets practical experience in set design and construction. "All of these jobs require specialized training which is hard to come by, and all have a shortage of qualified applicants on the outside," Bates added.

"Closed circuit television is proving an invaluable tool for improving the educational effort of this institution. It reaches beyond the walls and brings life and the educational facilities of the outside world to the men who are confined in this institution," he concludes.



Inmates designed and built most of the equipment within the CCTV section of the Academic School. In addition they maintain and repair all of it, including parts such as these shown in the control room.

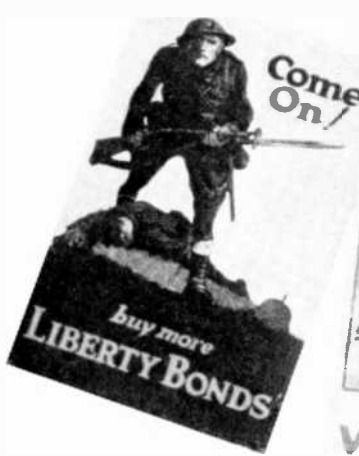
Will you have a part
in
Victory?



Two Color Museum Print



I WANT YOU
FOR U.S. ARMY
NEAREST RECRUITING STATION



Come On!

Buy more
LIBERTY BONDS



THEY KEPT THE
SEA LANES
OPEN

**INVEST IN THE
VICTORY LIBERTY LOAN**



CLEAR THE WAY!!
BUY WHEAT
FORTH
LIBERTY LOAN



FOOD WILL WIN THE WAR
You came here seeking Freedom
You must now help to preserve it
WHEAT is needed for the allies
Waste nothing

The Untold Story of Tape Recording

by Janice Rentschler Shea

II. TREASON AND TELEGRAPHONE

In the palmy days just before the outbreak of war in August, 1914, most Americans had never heard of magnetic recording or its inventor, Valdemar Poulsen. The few who had knew that Poulsen had developed a machine, the telegraphone, which could record and play back on a simple spool of wire the human voice more accurately and more efficiently than could Edison's dictaphone. In fact, only a decade before, some 17,000 investors in virtually every state in the Union had invested in the American Telegraphone Company, which was authorized to make and sell telegraphones based on Poulsen's patents. In the scientific community, there were those who remembered the stir Poulsen's invention had created at the Paris Exposition of 1900, and the commercial interest which had arisen at the Pacific Exposition of 1909.

Those people who knew about the telegraphone thought of it primarily as a business machine. What they did not know was that there were others who realized it could be put to far more sinister purposes.

For a variety of reasons, the American Telegraphone Company had gotten off to a rocky start after its founding in 1903. By May 1908, it had gone through virtually all of its initial working capital, and was on the lookout for more.

More was offered by Charles D. Rood, then the president of the Hamilton Watch Company of Lancaster, Pa., who offered \$188,000 on condition that he become the new president of the company. At the time the offer was made, no American was aware that war was in the offing, and none of the stockholders doubted that the money was Rood's own.

In 1914, American Telegraphone's national sales representative A. W. McCrillis, had trouble getting enough machines to fill orders (in fact, since his appointment the year before, McCrillis had received only 50 telegraphones, 20 of which he sold immediately to E. I. Du Pont de Nemours & Co., then America's largest maker of munitions). DuPont, which was later to give up most of its munitions business after being charged by Congress with being "a Merchant of Death," was at the time filling a substantial portion of France's armament needs. The company bought telegraphones because they promised to be simple, efficient and inexpensive pieces of dictating equipment.

After the first 50, McCrillis had trouble getting

any more. But when the Imperial German Government placed an order in May—less than two months before hostilities were to break out—directly with Rood for four machines, it was filled promptly—something the stockholders heard nothing about.

Later that year, a stockholder named Frank A. Brittain wrote Rood to tell him that the Panama Pacific Exposition was scheduled to take place in San Francisco early in 1915. Wouldn't it be good publicity to have the telegraphone on display, he wondered. Rood didn't answer. So another stockholder, H. P. O'Reilly, pursued the subject. Not only would a public display of the telegraphone generate needed publicity, he argued; but it would help McCrillis sell machines.

Rood, busy making machines for undisclosed clients, didn't answer at first. When O'Reilly pursued the subject, Rood told him that he didn't consider the possible benefits worth the cost of shipping a machine to San Francisco. Besides, he said, he didn't have one to ship.

When the fair opened, there was a telegraphone on display. O'Reilly had dug one up somewhere, and paid the display and shipping costs himself. The results appeared to pay off. The machine promptly won a silver medal, which normally would automatically have assured it coverage by every major scientific publication. This wasn't good enough for O'Reilly, who invited the jury which made the award to come back for another look.

Following the second visit and demonstration, O. H. Fernbach, secretary to the superior jury, wrote O'Reilly, "This is to notify you that after due consideration of your protest, the superior jury has raised the award made on your Telegraphone from silver medal to gold medal."

The jubilant stockholder felt that the top award the jury could give would bring in a rush of orders as well as articles on the principle of magnetic recording. What he didn't know was that Rood already had notified any publisher likely to describe the machine in detail or how magnetic recording worked that he would consider such an article an infringement of Poulsen's patents. It was argued in retrospect that on the one hand, this was sound business practice to prevent other manufacturers from seeking a way around the patents; on the other, it prevented people from learning that there was such a thing as a telegraphone. Nevertheless, orders began streaming in on the strength of the award. Rood ignored them all—or almost all.

The Untold Story of Tape Recording...



It's interesting to note at this juncture the differences in public opinion and espionage techniques in 1915 and the present. At the time of the Sayville seizure, there were three distinct schools of opinion in the United States, with a variety of gradations. Perhaps the smallest was that which began by calling for U. S. economic support of Germany. In the face of hostile public opinion, this view quickly changed to "Let's keep out of it." Perhaps the foremost proponent of this philosophy was William Randolph Hearst, whose newspapers trumpeted news of British and French atrocities. It was rumored that Hearst was publishing with the aid of German money; to counter the charge, he began a practice that was to last most of his lifetime—running an American flag on

the front page of each newspaper every day.

Hearst's major enemy, Hungarian-born Joseph Pulitzer, became an early champion of the British cause. Almost daily in his *New York World*, one could read of the villainies of German troops in the villages of Holland and Belgium; and the exploits of the German espionage network in the United States.

The *World's* spies under America's bed were by no means imaginary. Captain Franz von Papen, then an energetic attache of the German Embassy in Washington, was in charge of a network of agents. One had nearly succeeded in blowing up the main railroad bridge connecting America's munitions factories with the port of Halifax, N.

"All the News That's
Fit to Print."

The New York Times.

THE WEATHER
Partly cloudy, showers this morn-
ing. Tuesday, fair, moderate
west to northwest winds.
17 to 20; Wednesday, 16 to 18.

VOL. LXIII, NO. 26,645

NEW YORK, MONDAY, AUGUST 3, 1914.—SIXTEEN PAGES.

ONE CENT

RUSSIA INVADES GERMANY; GERMANY INVADES FRANCE, BUT DOES NOT DECLARE WAR; ENGLAND'S DECISION TODAY; BELGIUM MENACED, LUXEMBURG AND SWITZERLAND INVADED; GERMAN MARKSMEN SHOOT DOWN A FRENCH AEROPLANE

England Is Holding Back
Though Germany Is
Seizing Her Ships.

CABINET IN NIGHT SESSION

Believed to Have Reached Final
Decision, Which Will Be
Announced Today.

Switzerland Now Invaded
by Germans, Boats Seized

Switzerland now invaded by the German army has invaded Switzerland and occupied the Swiss cantons of Glarus.

TREASURE SHIP HEADS
FOR A GERMAN PORT

Kronprinzessin Cecilie, With \$10,000,000 Gold for London and Paris, Headed for Home.

At 11 o'clock the Kronprinzessin Cecilie, a German mail steamer, was seen to be heading for a German port.

Russian Forces Cross
German Border at
Many Points.

SEIZE RAILROAD STATION

New Hold Eydtkuhnen, German
Town on the Main Line
Into Russia.

First Naval Battle Opens;
Cruisers Fight ON LIBAN

AMSTERDAM, Monday, Aug. 3.—The news has just been received here that the German cruiser Augsburg is bombarding the Russian coast port, Liban, in the Baltic.

Two Armies of Kaiser
Enter France and Be-
gin Hostilities.

ONE SEIZES LUXEMBURG

Hundred Thousand Men Enter
Duchy, Violating the Guar-
antee of Neutrality.

German Troops Shoot Down French Aeroplane;
Report of a German Airship Destroyed

BRUXELLES, Aug. 3.—German troops today fired upon and brought to earth a French aeroplane near Wood, 100 miles from the northern frontier of France.

S.—vital to the British war effort because American neutrality prevented shipment of arms from U. S. ports. Another had been captured with elaborate plans for wrecking any American ships which might attempt to help the British. Von Papen himself was finally ordered to leave the country; and his activities, perhaps more than anything else, helped to unite American public opinion on the side of the Allies.

Tuckerton, New Jersey, a sleepy little village nestled in the Jersey pines some 18 miles north of Atlantic City didn't seem like the sort of place where espionage could take place very profitably. Nevertheless, the Telefunken Company operated a short wave radio station there—one which had been reequipped just before the Guns of August let loose. Included in the complement of equipment at Tuckerton were at least two telegraph-phones, delivered early in 1914 and described as having been used "with great success." Late that year, the U. S. Navy seized the station not because of anything it had done, but because of the threat it might pose to transatlantic shipping. The Navy felt the station might be used to inform U-boats about the movements of coastal shipping. While the seizure was widely reported, details on the equipment in use (including the telegraph-phones) were kept secret until 1921.

Meanwhile, up and down the East coast, radio amateurs were reporting peculiar noises at night. The noise began promptly at 11 PM and continued into the wee hours of the morning. As one of them described it, it was "a musical note like the buzzing of a titanic bumble bee which sped through space."

It disturbed ham operator Charles E. Apgar of Westfield, N. J. so much that he used his own homemade wax cylinder recorder to transcribe some of it. Beginning on June 7, 1915, Apgar faithfully recorded excerpts for two weeks, still not knowing what to make of it. Chief Radio Inspector L. R. Krumm of the Bureau of Navigation in New York knew about the mysterious signals and heard about Apgar's recordings. He promptly summoned W. J. Flynn, then chief of the U. S. Secret Service, and Apgar to a meeting

in New York. Apgar played his cylinders for Flynn, and by the end of the month, word leaked out that there was something peculiar about the signals, and that they were linked with the Sayville, L. I. short wave station operated by the Atlantic Communications Co.

It was an open secret that Atlantic Communications was a front for the operations of Telefunken and the giant Siemens electrical combine, and that its president, former Congressman Herman Weiser, wasn't much more than a figurehead. The government knew that Sayville, like Tuckerton had been rebuilt recently almost from the ground up, and it suspected that the peculiar signals were some form of code. The public, however, was never told that the code had been cracked.

At the opening of hostilities, the Navy had sent an observer to watch the goings on at Sayville which ostensibly was merely an international transmission station for commercial cablegrams to Europe (the companion station in Europe was located near Hamburg, Germany). One of the duties of the observer was to see that the station complied with the law which required all signals to be sent "in plain English." Early in July, the New York World, a strong advocate of U. S. intervention on behalf of Britain, charged that the station's German engineer would wait until the Navy man disappeared into the men's room or went off duty, then hurriedly would transmit code messages before he could return. Apparently the significance of the 11 PM transmission was that this was the time observers changed shifts.

In any event, based on the cylinders recorded by Apgar and general suspicions about the station, the Navy and the Secret Service seized it on July 10, and a lid of secrecy was clamped on what the Navy men found there. By 1922, the government was willing to admit that there had been at least one telegraph-telephone, on which messages were recorded in Morse code at standard speed. The tape was played at high speed backwards, rerecorded in Germany and played back at the original recording speed. There was no code to be broken, after all.

How had Telefunken and the German govern-



GERMANY SURRENDERS! THE FIGHTING ENDS!

ment been able to get telegraphones when the company's own sales force couldn't get them? If Congressman Weiser was a front for the Germans, couldn't Rood be one too—and couldn't the \$188,000 he put up in 1908 have been advanced by the Imperial German treasury? When war broke out, even Rood's worst enemies among the stockholders never suggested such a thing. But in the light of events which were to follow, people—and eventually Congress—began to wonder.

The interesting thing about the Germans' use of the telegraphone was that it had been suggested by inventor Poulsen in the first place as a more efficient use of telephone lines by permitting a telephone line to carry two, five or ten times as many messages in a given length of time. Poulsen, however, had never envisioned using high speed recording as a code, however; and Rood's effective suppression of technical data about the instrument had permitted people to forget that an essential part of the design was a speed for normal recording and a high speed for ultra-fast playback. The Germans, however, seemed completely confident that this "code" couldn't be broken. The Secret Service never revealed exactly what the messages Apgar had recorded contained.

Then, shortly before the United States entered the war, the German submarine *Deutschland* paid several goodwill visits to Atlantic Coast ports. At one of these, the press was invited to see the latest in fighting ships, and a photographer took some pictures below decks. One of these showed plainly two telegraphones.

When he saw the picture, Dr. William D. Tracy, a stockholder living in New York, fired off a letter to Rood demanding to know how the Germans had gotten telegraphones when McGrillis couldn't. Rood replied that he didn't know anything about any sales to the German government. But a Congressional investigation later showed that two years prior to Dr. Tracy's inquiry,

six machines were sent as per an order from Rood expressly stating them to be "for the German Government." The order had come by way of Denmark.

Now was American Telegraphone's collusion with the enemy at an end. In April, 1918, the U. S. Signal Corps sent the company a routine request asking if the telegraphone could be set up for recording messages. Rood replied that the company was still experimenting with the machine and discouraged the order. He suggested that such a use would be in the nature of an experiment—even though the Secret Service and the Navy knew that the Germans had been using their telegraphones in just this way for nearly four years.

The Signal Corps wouldn't take no for an answer. Finally, in September—only 60 days before the Armistice was to be signed—the company delivered the first four machines. During the construction period, Rood asked to be advised as to the proposed use of the equipment. It was alleged during the later investigation that he actively sought intelligence data which conceivably would be recorded on the machines. His inquiries, according to Senate testimony, included details on where the machines were to be placed, whether it would be in France or elsewhere, and under whose personal supervision they would be operated. Later testimony indicated that Rood had been given some information on the movements of the U.S.S. *President Lincoln*. On May 31, 1918, the ship was torpedoed.

When the four machines finally were delivered, "in some kind of condition," according to a stockholder spokesman, they failed to work. "Nobody has ever been able to trace the cause. I have tried to find out," attorney George E. Sullivan, who took over the stockholders' interests in 1919 told the investigators.

To top it all off, American Telegraphone's most

"... A more efficient use of telephone lines."

satisfied customer, DuPont, decided to trade in its machines for the "new model" promised by Rood. During the final year of the war, DuPont sent all 20 of its machines back. The ones it received in exchange, according to a spokesman "were defective in materials and workmanship." After struggling with them for nearly two years, DuPont junked the lot and turned to the more reliable dictaphone.

News in 1918 may have been good for Americans following the war, but for stockholders in American Telegraphone, it was simply one disaster after another. During the year, Poulsen's patents ran out. The stockholders braced themselves

for a tidal wave of imitators of their machine—but none appeared. Word had gotten around that American Telegraphone's troubles simply demonstrated that Poulsen's patents were impractical—that any more money spent on building a magnetic recorder would simply be wasted.

Rood didn't think so, however. He hung on tenaciously to the 94,000 shares of stock he had purchased in 1908, plus the shares he had issued to himself over the following decade. Rood and the minority stockholders were heading for a showdown. It began in Supreme Court of the District of Columbia on March 20, 1920.

(To be continued)



"Wait here—I want to get my tape recorder."

Let's Make a Record

by *Arthur C. Matthews*

WARNING: This article is not aimed at the man who wants to make records and make money; rather it's aimed at the *advanced* tape hobbyist who wants to be creative. Here's a chance to use your recorder and enjoy it in a new way.

"Me, make a record? Never!"

At least that's what I thought. I know better now. It's not the easiest thing in the world, but it's not as difficult as you think, either. I was at a convention some years ago, recording for my own pleasure and edification when people began coming up to me and asking for copies of the speeches, choral concerts, folk song sings. Nobody wanted tapes either, so I said I'd see what I could do. I ended up producing seven 12 inch LPs and an EP. Since then I make a record every chance I get. Not for profit (there isn't any) but for the fun of learning how to use my tape recorder for something besides recording baby gurgles.

Since my first batch of records, I've recorded a student symphony, pipe organ dedication concerts, drama, massed choirs with brass and two organs, dance bands, individual soloists, the school choirs and bands. If you have a tape recorder in the \$300 and up bracket, you can make a record for your church, school or community group. You'll have fun, and the organization will have its memories preserved for cold winter nights. A record can help build organizational pride. And, sometimes, it can be a project to make a little extra money for the group.

"OK, I'm willing to listen. How many do you have to sell to break even?"

That depends upon the price. At four dollars each, you need to sell 50 records to break even. If you sell 100 records, you can charge \$2.50 and break even. I think we'd better talk about marketing first, because it'll determine whether you say: "Go ahead, press 'em."

What do you need to make a record? Basically, a tape, spliced with leader on both ends. That's all *you* need to do. The company you choose does the rest—for a price. They make the master,

mother, stampers; press the record, label it, even put it in a jacket for you. What do we mean by a master? Here's how we get a record from a tape: The engineer takes your tape and cuts a record on a recording lathe which chips out a strip from the blank record base. If you've ever seen a lathe cut metal, you're familiar with the process. In fact, the recording lathe needle (stylus) is very similar to the lathe tool—flat and sharp like a chisel. The disc for the master is often acetate.

The master then goes to the plating process. An electro-chemical process coats the master with metal. Not only coats it, but fills the grooves. In the one step process you use this to press the records. Like film in a camera, the record at this point is a negative, because you have to press the grooves into the record. So ridges are grooves and vice versa. If you're going to make a large number of records, I'd recommend the three step process instead. It's more expensive, but it does guarantee you protection in case anything happens to your "negative" or "mother" as it's called in the trade. Otherwise if during manufacture something happens to the stamper, you have no choice but to recut the master. In the three step process that first negative is used to make a positive and another negative. So if something happens at the press, you can always go back to a mother who will dry your tears and give birth to another positive or negative. The operator takes the stamper (negative) and places it in a machine that heats up, like one of those pants pressers in cleaning stores. He puts a dough of plastic in the machine, slaps in two labels, and the two halves of the press move together, and presto! A record (perma pressed, creases and all). The operator inspects the disc, and packs it in an envelope, perhaps a jacket (costs extra) and

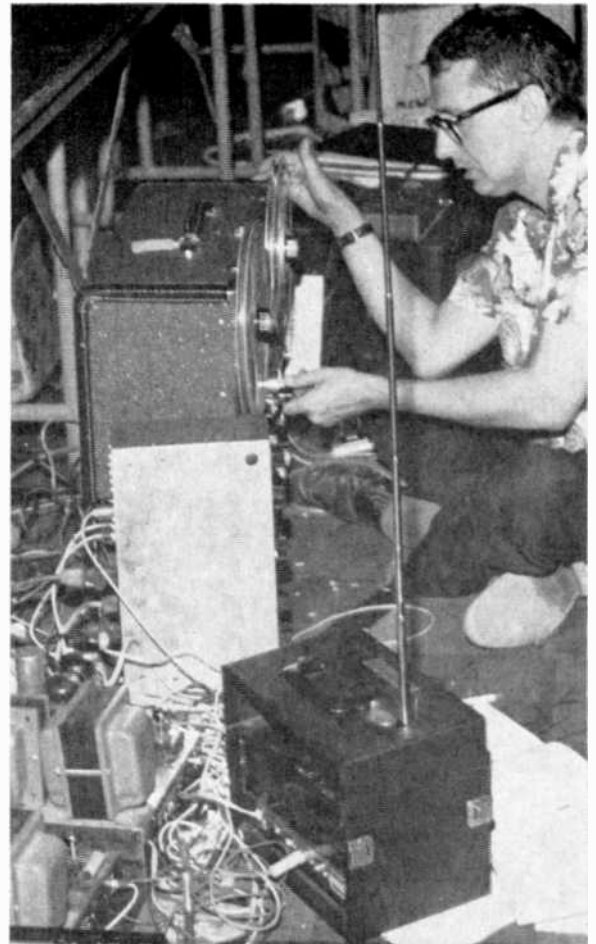
Don't limit yourself to music. Plays, events or a combination of these things make good records.

slips the finished pressings into boxes of 25, 50, or 100 and ships them to you (charging you shipping costs).

This first box of records costs and costs. To make the master from the tapes, to make the mother and stampers costs \$80 to \$120 for a two-sided LP. One record, a hundred, a thousand—the *fixed cost* of the recording remains the same. You may have to pay for additional stampers, since they tend to wear out, but I've never made enough copies to find out. If you ask, the company will send you the six pieces of your recording if you like. They make interesting wall decorations, and I have a friend who mounted a small clock motor in the middle of one and now has a very attractive mantel clock. The basic cost then is \$80—\$120. Divide that by 50 records and you have a cost of two dollars each and not a pressing available yet. Pressings (the actual records) vary in cost according to how many you have pressed at one time. Each time you reorder you start again on the cost scale, except for the stamper which is kept on file for about a year. The cost varies with the time of year (busy or slack), current labor costs, and the company you work with. For the 25 record lot you can expect to pay \$1.75 a pressing. If you buy 200 records, the price may go down to 69¢ each. If you buy several thousand records, the price goes down (by pennies) even further. The reason for the initial high cost is the set-up time of the press, billing, administration and the like. With a large quantity, these fixed costs are spread out.

If you want to make a professional, personalized record jacket, forget it! At Luther High School North, we made a recording of the choir. The record jacket cost \$1.25 each (in lots of a thousand) and the record cost less than 50¢. The expenses for an original album cover include art work, plates, setting up presses, making the run. Single color (black) isn't too bad. But add one color and you need two press runs. Or if you use full color, you need color separation plates and an expensive press run. Remember, the records you're selling are sold sight unseen. The organization will buy the record in a plain envelope if necessary.

Don't limit yourself to music. Plays, events, or a combination of these things make good records. One of my most successful recordings was for a homecoming souvenir. We recorded the homecoming show, football game, singing, cheers, parade, interviews with kings and queens and then tied the whole thing together with narration. We called it "The Pigskin Powow." We sold nearly 300 copies in a school of 1,000 at \$1.98 and made a



The author in his usual mess. This one at Concordia College, Moorehead, Minn. Crown 700 series recorder, Sony radio mike, Dynakit amp-preamp, a switching system for moving stereo channels from spot to spot is out of sight on the right.

profit for our drama club. Every participant in the recording is a prospect, and so are his wife, relatives, in-laws, friends and neighbors. A personal prejudice: in this day and age, don't make a record in mono. With the recent price increase in mono records by the major manufacturers, most people will now have to do something about getting ready for stereo. If you make both a mono and a stereo recording, it'll be another \$100 for mastering for the separate versions. And you can be much more creative in stereo than mono.

Next problem is making the tape, which breaks down into several components.

1. Finding a hall
2. Choosing recorder, mike, and associated

Let's Make a Record . . .

- equipment
3. Mike setup
 4. Working the recording session
 5. Editing

One of the most important factors in making a recording is choosing the hall. Unfortunately, all too often the hall is chosen for you by the performing group, and you have nothing to say about it. If you *do* have a choice, however, there are several things to consider. For music, of course, you'd like a hall that has reverberation—a large room not covered with deadening materials. I did some recording in a gym that was quite good. In another gym of similar size but with acoustic treatment, the recordings were not so enjoyable. Too dead. For music you'll want a little life. Why? Well, take a choir: you'll find that the amateur singers are devoted but not necessarily perfect. A little reverberation blends things together, makes the choir sound a little less raw. As a matter of fact, the liner notes of a Vienna Choir Boys' tape admits the necessity for reverberation even for this highly professional group. The hall helps blend what might otherwise be a piercing experience into a delightful one. Of course, for voice only: close to the mike, and a relatively dead area. I've found a stage with drapes and carpet on the floor a good location for dramatic or narration material. In our Pigskin Powow, the conditions varied from the gym-sound to the stage, to the typical outdoor sound. This added a sense of realism to the recording. Most living rooms, unless they are fairly large and fairly well carpeted, with the actors working close to the mike, are not suitable.

It goes without saying you ought to have the best tape recorder you can find. A recorder in the \$300 and up bracket is perfectly satisfactory. I prefer two-track to four-track. There's less noise on the tape, but you can record with a four-track tape recorder and get highly satisfactory results. Whichever you use, remember to record in only one direction on the tape, to facilitate editing. The professional recorder has to be better than yours because professionals seldom make the master from the original tape. They make copies of copies. The more the engineers gimmick up the record (called re-mixing) the further the final version is away from the original tape. Each re-recording increases the previous noise level—not like 2 plus 2 but like 2x2. That's why the professional spends thousands of dollars for little improvements. But your recording is a one-step process—from master tape to master record.

Almost any tape recorder improves dramatically if you add a good mike. The mikes supplied with

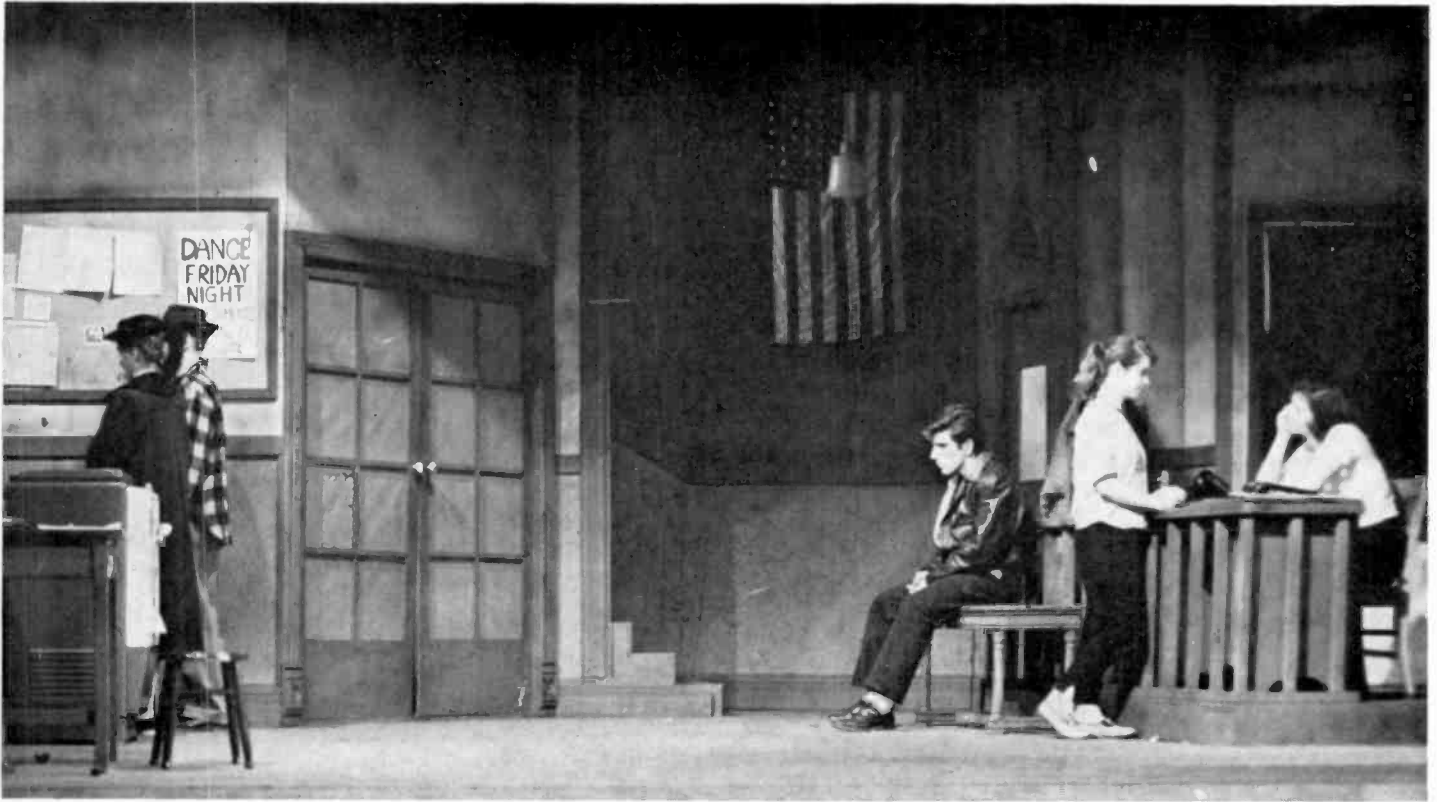


Local theatre groups make fine subjects for

most recorders are entirely inadequate for recording live music. Obviously we don't have time to go into all the rules for choosing a mike, but I'd like to give you a few rules of thumb to help. Let's assume you have about \$100 to spend for a pair of mikes. First you'll have to decide which microphone pattern will serve most purposes.

1. Omnidirectional-picks up from all directions equally well. This is theory and not necessarily practice. Even from the back, the sound sort of folds over the edge and goes into the front.
2. Bidirectional—usually a ribbon mike, with an aluminum accordian ribbon suspended between the pole pieces of a magnet. As the ribbon, about $\frac{1}{4}$ " wide and 0.001 inches thick flaps in the breeze, it makes the electrical impulse necessary to produce the sound. Since the ribbon is "floppy" the 0.001 inch way and relatively rigid the $\frac{1}{2}$ " way, the ribbon mike responds essentially to sounds striking the wide face of the ribbon, front and back. It's quite a narrow pattern.

*The microphone does not
work exactly like the ear.*



tape recording. Microphones used to record the above scene are not visible in the photo.

3. Cardioid (uni-directional); imagine a perfectly spherical balloon. Push your finger in at one end making an indentation into the balloon. You have the essential pattern of a good cardioid mike.
4. Super-directional—usually recognized by the long tube sticking out of the casing. A very narrow pickup pattern for special problems. The usual use is in PA work for noisy conditions. I used them for recording plays live at public performances.
5. The multi-directional mike—which either by mechanical (Schoepps) or electrical (AKG C12A, Neumann 496) means, permits you to select any of the patterns above.

Some mikes, especially the condenser type, come with changeable cartridges so that you can screw in the pattern you want. Omnidirectional mikes are supplied with most tape machines. They are the least expensive, ordinarily, because they don't require any electrical or mechanical modifications to create the pattern. For most amateur recordists they avoid mistakes. Plunk the

mike down, gather round, and let go. But for the person who is going to make a record, an omnidirectional mike may not be the best choice. The microphone does not work exactly like the ear. The ear has a brain connected to it, hopefully; and if you listen in a bad room, your ear makes the compensation. The mike does not.

A microphone "hears" what is there, adding its own characteristics to the sound and sends this signal to the recorder. The recorder more or less faithfully records the impulse, and your playback system reproduces what the mike "heard." An omnidirectional mike, especially in a small room, picks up the main sound, but it also receives bounces off the walls, ceiling and floor. So unless you have ideal recording conditions, an omnidirectional mike will not give you a good recording.

If you have only a little to spend, I'd recommend a pair of bidirectional ribbon mikes such as the Dynaco 50 series, the Shure 330, or the RCA SK46B. The bidirectional pattern has an advantage. Its very narrow front and back pattern won't

Let's Make a Record . . .

pick up so much "noise" from the room. The bidirectional ribbon mike, however, has very low output. That means that if you ordinarily use your recorder with the microphone input control at say 10 o'clock, you may find yourself pushing the control (and the noise level) up to four or five o'clock.

If you have a little more to spend, you might take a look at some of the more expensive cardioid mikes. The cheaper cardioid mikes often are not equally sensitive at all frequencies. They also have pickup "nodes" (sensitivity loops) at the back of the mike which add a peculiar "color" to the sound. A cardioid mike tends to make a cleaner recording in a poor recording room. The best buys are in the range from \$150-200 a pair—University model 1000, Shure model 510, Electro-Voice model 576, for example. Another hundred dollars up are the Synchron Au7a and the Electro-Voice 666. If you have a favorite audio dealer, he might loan or rent you a pair of good mikes so you can find out. The only advice I can really give: spend a little more than you wanted to.

The ideal choice is a pair of each of the three types or a variable direction mike. However, these latter are not cheap. A pair of AKG C-12As will run about \$1000.

How do you set up the mikes for the best sound pickup? I'm afraid there are no hard and fast rules. I learned by experimentation. And by having a good ear. For voice recording you'll want the mike relatively close to the performer. Within six feet generally and more likely 18 to 24 inches. This close talk allows you to tape at a lower volume level (improving the noise level), eliminate bad reflections off walls, and have a more natural sounding voice. For stereo you can put your mikes about a third of the width of the room apart. Set the mikes close to one end of the room, probably the short end, and move the mikes down the length of the room about five feet at a time. Have the artists remain in one spot down at the far end, reading, singing, or playing the same phrase. Get at least 10 seconds' worth of material from each position. When you get within five feet of the artists, move forward about six inches each time.

If you're lucky enough to have a variable pattern mike, vary through the patterns for each take before you move the mikes. It's essential to have the same material at the same volume level so that when you listen to the test, you'll be able to make valid comparisons. This testing ought to be done just before the regular recording session. If you're working with amateurs where large amounts of money are not involved, you can afford to experi-

ment. In fact, you can't afford not to. In a recent organ recording, I placed mikes practically in the chambers, half way down the building, and way up front on top of the lecturns. This building was particularly "dead." With the mikes in the organ's maw, the sound was dead and harsh. About half way down we got a little more of the room sound and the organ sounded a little livelier. Way down front, we got our best balance for most types of music. At another church, a very live one, we had the mikes up on the balcony and up in the air to get a best sound. Experiment is the only answer.

I've learned one thing from these situations: For organ works, choose something contrapuntal rather than harmonic—Bach rather than Franck. You don't get a good test of the clarity of the instrument with chord structure. If you're working with orchestra or chorus, a loud, rapid disconnected piece followed by a soft slow section will give you a good idea of clarity. I like to clap my hands and listen. That's sometimes a very good way to get an idea of where to start.

"We've got the test tape. What do we listen for?"

Well, just recently I recorded music for a play. The instruments were limited, and we wanted a harsh miked effect. I put my four mikes right in the instruments' bells so to speak. For each song, I shifted the mikes around to see what would happen. It worked out fine for our purpose, but I'd have hated to listen to this sound in my home. We spent an entire evening moving mikes around and then listening. That's the crucial point. What are you listening for? Listen quite a few times. You may have to splice out dead spots so you can get an idea as one "sound" follows another. Keep a record of the mike setups and patterns. I almost forgot this one time in the excitement of recording a rock and roll group. Fortunately, I remembered most of what I'd done. But there's nothing like a written record.

If you have multi-directional mikes, you'll want to splice all the similar patterns next to each other on the tape. That way you can tell whether the cardioid at five feet sounds better than the cardioid at 10 inches. Of course, you could move the mikes between takes, but splicing is easier, it seems to me. Choice is a matter of taste. I suspect you should probably consult a number of people. When I recorded the teenagers, they all came over after the test recording, listened to the takes, and made comments: "Drums too heavy." "Voice a little distant." "Harmonica overpowering." "Not enough bite to the lead guitar."

When you've eliminated some, resplice with the ones that look most promising right next to each

In most recordings the engineers are constantly fooling with controls.

other. Keep track which is which. I usually have a verbal cue on the tape like "Take two, take 16" or something to guide me. By the way, don't try to listen to the recording on the spot, even if you have a good monitor. Besides the pressure of the recording, the room you record in will probably not be a good one to listen in. Use a living room atmosphere. Don't get one that's too live, because it'll give a false perspective. One with all drapes and carpets may be bad, too. In this average living room don't use average equipment. Above all, don't use headphones to make a decision. They're very dangerous. They give a beautifully spacious effect that never happens with speakers in a room.

Set up your recorder at the recording site so you can get visual indications from the people making the music or sound. I've seen a professional man with a closed circuit TV monitor, but you probably won't have that advantage. There are two basic kinds of recording: "live" (with an audience, in performance and "studio" (no audience, before or after a performance). If you're working with rank amateurs, especially in music, a performance recording has some "quality" advantages. You may have audience problems, especially with omnidirectional mikes. I did a recording of a Handel organ concerto arranged for the main organ and the echo organ. We had to keep a mike open fairly wide to pick up the echo properly. Just after an echo section was completed, a big crying jag from some young member of the audience shattered the baroque mood created by the soloist.

Sometimes, though, a studio session with sufficient magic—equipment, engineers bustling around, magic words like "take" and "give me a level" will mystify the troops into making a good recording. A studio recording permits you to make several takes. Of course, if there are several performances of the music, this can serve the same purpose. At this same "crying concert" we had an afternoon and evening performance. We had some trouble with our tape in the middle of a Bach piece, but because I had recorded it at both performances, we were able to splice a good version out of the two takes. I hadn't been able to go over the program with the organist. He played some pretty loud pieces. We kept a record of volume readings and during the second performance got an undistorted recording. For me at least, on-the-spot recordings with thunderous applause spoil the music. But for your group, perhaps the applause will swell their ego and the number of records sold.

In most recordings, the engineers are constantly fooling with controls—hundreds of microphones,

minute adjustments of balance. I suspect that's because they have to earn their money. Inactivity may be interpreted as a sign of inability. My basic philosophy is: work with the music to get an idea of about how loud it's going to be, set the controls there and leave them. My work is in choosing the place, pattern, position, and setting. During the session I watch to see if we're peaking a little high, then very carefully touch up.

Sometimes all your plans go awry. Just before school closed for the summer at Bemidji State College, the band gave a concert with "Doc" Severenson. I was not able to attend the rehearsal because we were in the middle of a play with 37 sound cues, and I just couldn't. I wish I had. "Doc" stood directly in front of one of my cardioid microphones for a solo. He has lungs of leather and tremendous control. When the whole band played I had my levels at six, but with Severenson, I was lucky to crack 2½ on a scale of 10. We had some distortion, I'll tell you! There are some ways of avoiding this recording problem, but they're all expensive, and those that are not expensive are unsatisfactory. So for this stage of the game keep it simple.

As for multiple microphone setups, problems multiply with the number of mikes. Most recorders have only inputs for two anyhow. You can add a mixer, Shure has a very good little one out now, but for the moment stick to two mikes. I must admit to using four mikes several times. I had a recording involving two choruses, two organs, and brass scattered around a large church. I had a pair of AKG-C 12 variable pattern mikes up in the choir loft and a pair of Sony C37A mikes down front to pick up the other choir I sometimes wish I had other mikes for touchup. But I've found out another interesting thing. If you have a directional mike, you can do a lot by moving the mike in relationship to the instruments. In one recording I had too much flute and not enough trumpet. I just turned the mike slightly so that the flute was off mike, and the trumpet came through beautifully.

If you're recording in a studio session, it's probably best if you can listen to the playback before you go on to the next take. I always put a piece of paper on the takeup reel so I can find my spot again. Sometimes the artists (talent) will feel they want another take. Don't play the recording back at a very loud volume. It's true that you'll be able to hear inner detail and inner mistakes at loud volume, but it's also true that you'll be getting a mistaken impression of how it's going to sound in a living room. Besides, very loud volume tends to "numb" the ear and instead of helping

Let's Make a Record . . .

you hear errors, may lead you astray.

Now comes the fun. The recording's been fairly straightforward—a concert performance. If there's more than one performance, listen to both sessions and decide which of the two performances is best for each section. You'll have to do this by splicing the versions one next to the other. Listen with the director or performers: get out your best unprejudiced ears. Between you, decide the take you want. When splicing the tape, make sure you have a little room noise at the beginning and the end. When making the final splices, have the volume up loud (earsplitting) and make sure the last of the music has died away before you make a cut. Some manufacturers are splicing in room noise between numbers. You'll probably be better off with leader tape on either end of the take. If you're running at $7\frac{1}{2}$ ips (that's certainly the best speed at the moment) splice about three feet of leader ($4\frac{4}{5}$ seconds) between sections. If you're going to band separate numbers, this tape allows the engineer to make the adjustment to give you the bands (spiraling).

If you're trying to eliminate a mistake within a take, you'll have either to decide to let it through or take your life into your hands. Editing within a piece is dangerous and nervewracking. With a studio recording, you can often go back and record the section again, especially if you have been listening during the recording. When recording a retake, make sure the artists go back to a point a few bars (or words) before the error and repeat the material in the same tempo as in the original (there's the rub). Why go before the error? Why not start at the error? Well almost any room has an echo. If you start at the error, there is no echo of the previous material. You'll hear a sudden "slup" as the edit passes through. With the echo as part of the tape, you may be able to get away with it.

Now comes the tricky part. Move the tape slowly back and forth over the heads (find out the best way for your particular recorder) with the volume control up most of the way and listen to find out where the echo drops off and where the initial sound starts. Look into the recorder, find the spot where the tape passes the playback head. Mark the spot either at the head (careful not to scratch the head with the Magic Marker, pencil, or grease pencil) or mark the spot at some point outside the head cover. Make a jig (it has the center of the head and the line where you marked laid out) and cut at the proper point. Use a non magnetic scissor or razor blade, or tape splicer. Take the second take and do the same thing, cutting just as the note or voice starts. Splice the

two good parts together and listen several times. Have somebody else listen and see if you did it right.

You may find occasionally that you'll have to drop a number because you just can't get a good take. You can, of course, have the manufacturer edit the tape. They charge about \$16 an hour to edit tapes. Learn for yourself. And if you want to learn, have somebody play something and make errors for you. Then you can, at your leisure instead of under pressure, learn to make the edit.

I always have a moment of terror just before I make the splice. Once it's done, it's done. Professionals can relax. They often don't work with the master tape but with a copy. If they make a mistake, just run off another copy and start again. You aren't so lucky. Don't try to work with a copy. Your equipment probably isn't good enough to make a good copy. If you make a mistake—that's the way it goes.

Plan your record so that you don't have more than 25 minutes on a side. Some of the new records advertise 35 minutes on a side, but check the people mastering for you, they may not be able to do this. Follow their suggestions. You may or may not put the material on the record in the order in which the group played it. The average concert or recital is just too long to put on one record. After you've decided what to keep and what to drop, go through the material again and decide the final order. Even in studio sessions you may not record in the final order. An organist I worked with preferred to get the "hard" music out of the way first and move on to simpler things later as his fingers became tired. Sensible arrangement. When you have the final order, make sure that you put about five feet of leader tape on each end. Put one side of a record to a reel. One reel contains side one, the other side two. Label the reels carefully. I mark with a magic marker directly on the reel. I usually send the tapes in to be processed in the wound position. If you do, make sure to warn the engineer to rewind before playing.

On a separate sheet of paper (cut to the size of the tape box) type out the program order, timing for each selection, timing for the whole thing, and an identification of the group or recording. Using rubber cement, glue this sheet on the cover of the box.

People who spend a lot of time and effort writing music or drama like to get paid. We have a copyright law to protect them. Don't put yourself in a position for a lawsuit by trying to sell copyrighted material without getting the proper clearance. As a rule of thumb, music or literature

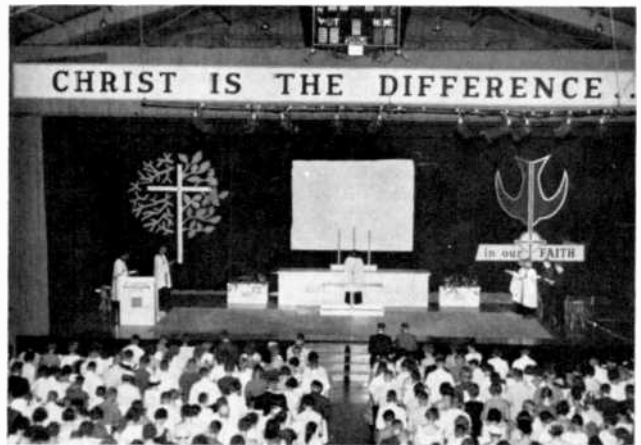
*The more records you buy
on a single order—the better
the price . . .*

written before 1913 is out of copyright, as is most folk music. That includes the bulk of classical music, the complete works of Shakespeare, Walt Whitman, Edgar Allan Poe and Anon. If you're in doubt about any of the selections you're recording, ask to see the performers' sheet music, scores or scripts. If there's a copyright notice, contact the copyright holder for permission. Some companies are very gracious about releasing their material, while others are very tight. Don't violate their instructions. If you're in doubt about any musical selection, contact the American Society of Composers, Authors & Publishers at 575 Madison Avenue, New York, N. Y., or Broadcast Music Incorporated, 589 Fifth Avenue, New York to find out whether a work is copyrighted, and who holds the rights to it.

Who will make the master? That's our next problem. I've dealt with Columbia, RCA, and Universal as well as local groups. Prices are about the same, but watch out—they'll give you different ways of figuring it out. When you get a price, make sure what you have to pay (postage all ways, for example). You have to cut a master and process the master. They may quote separately or together. Some companies include the label, some do not (like, \$12 per run). If you live in a large town, shop around. It seems to me that the people at a company matter more than the name of the company. Talk around and find somebody who works well with you. Prices will not usually be that much different.

In a smaller city you may have only one person or nobody. I prefer to work locally because you can get quick results with a telephone. Look in the magazines. Many have ads for recordings. Write to several companies and make sure you know just what they will charge you for. Read, chart, and compare. Sometimes you can get a "test" pressing. Expect to pay for it—maybe up to \$20.

Now we're getting down to details. How many records do you order? Get as many as you can on one order. The more you buy in a single order, the lower the price. Each time you order, you pay for the setup of the machine, labels, and overhead. If you've got definite orders for 50, try 75. That first batch of records I made, we ordered in 25s and 50s as things ran out. If we'd been a little more optimistic, we could have earned \$1500 more on the eight recordings. Of course, you can be more optimistic, too, and break the bank. A little financial point; many companies require 70-80 per cent down: cold, hard cash. I can't blame them. Too many people want to "make it big" in the market. They want to make it big, but



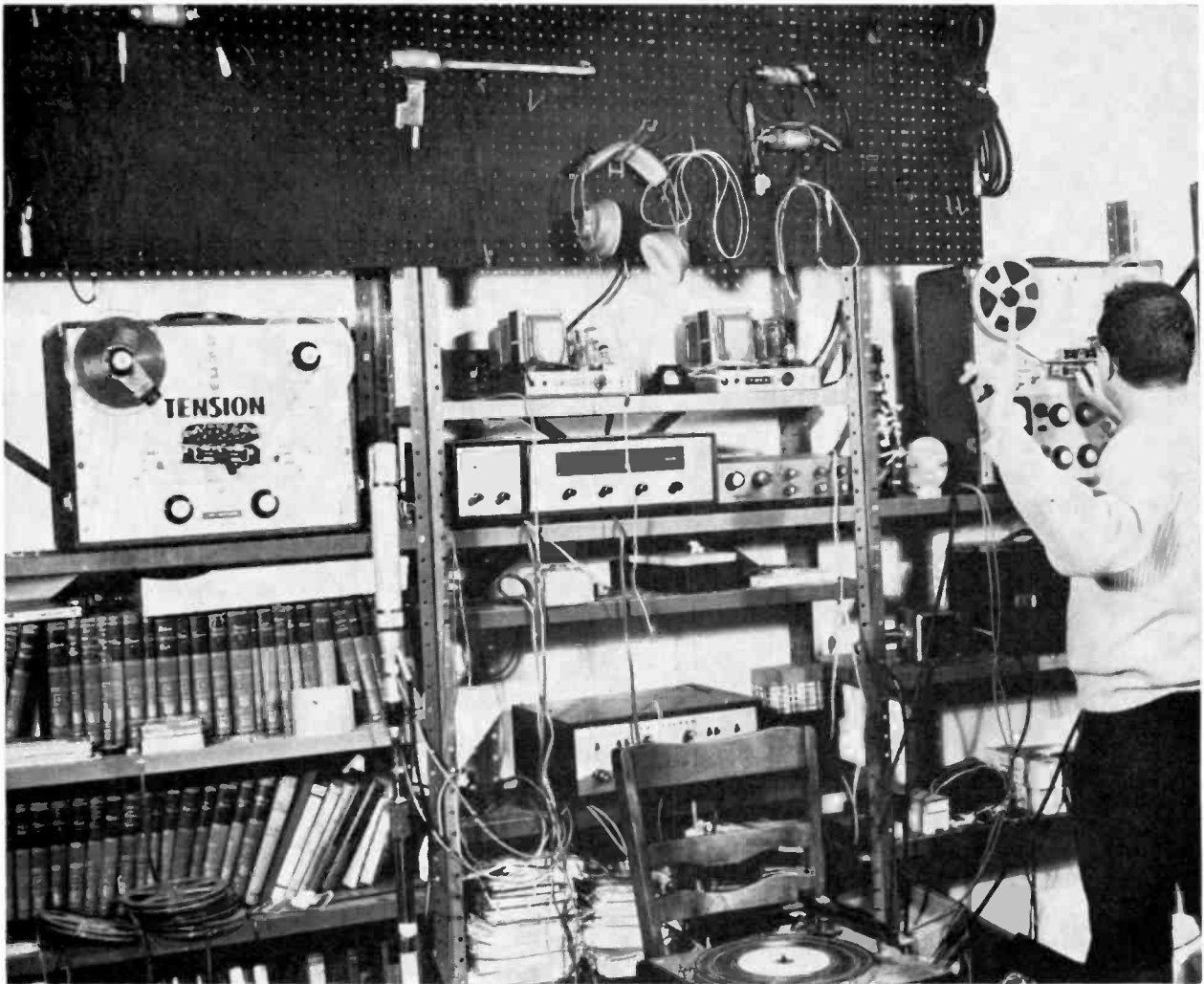
Typical of mass audience environment in which a tape recorder can be used effectively is the scene above. Careful placement of mikes is imperative for best results.

don't have the money to support their desires.

What should the labels look like? You can get almost any kind of label you want. I use a white label with red letters. I've used red with silver ink. Deep colors with silver, while pretty, aren't easy to read. You can have a company, group, or organization symbol printed on the label. The manufacturer will do anything you're willing to pay for. Don't try to put the whole world on the label. State who made the record. Indicate the numbers, who recorded them, and as many names as you can (flattery helps sales). The manufacturer generally will supply you with dummy labels. Type the information on the form, indicating which letters you want larger and which can go in smaller type.

Now comes the packing material. You may have a choice. Paper, glassine, polyethylene-lined paper and polybags. I like the lined envelopes best. With them, you may be able to get away without a jacket.

If you're going to have a jacket (sleeve) made, hold on to your budget. You can make your own jackets, too. Most companies will sell you a plain white cover for about 10¢ each. Many companies have "standard" jackets available in color for most purposes. A plain jacket of this type with no printing will cost you about 30¢ each. If you have printing on the front (usually quite limited), that will cost about \$25 per order. If you have a photo, perhaps another \$25-\$50. If you want information printed on the back—well you can see what's happening.



The author in his studio signaling a take. Headphones are not used for playback or recording. They give an entirely erroneous picture. Two AR-3 speaker systems act as monitors. The pattern changer is the small box below the windscreen. The "Tension" sign is not a normal part of the Crown playback deck.

If you have access to any creativity, you can make a delightfully novel and fun jacket of your own. Here, for example, are nine types you can start from. Check your paper seller. There is a gummed type paper which you can print on one side and then just wet and press on the albums.

1. Rubber stamp set on plain white or colored jacket. Comes with letters of different sizes and setup. Compose the title, groups, list of selections and stamp the material on the cover.
2. Using the same technique, stamp on colored pieces of paper, glue the paper in a design on the front.
3. Purchase rubber stamps with various type faces. Do 1 or 2 above. Use different colored inks.
4. Large linoleum block. You may have worked with this in art class in grade school. Carve out the design on the block (or several). Use various colored inks. Fine lines and clear printing not possible. Combine with 1, 2 or 3 above.
5. Many schools have poster machines. It's a flat bed with moveable metal or wooden letters. Set up for a poster. Run several colors.

6. Abstract art machine. Costs less than \$10. You drop colors on a whirling piece of cardboard. Individual covers for each record. Use one and three above.
7. If there's a school or art group available, offer a prize (small) for good designs and commission the artist to make duplicates. Or take individual designs from different artists and rubber cement to white or colored jacket. They might even want a copy of the record.
8. A silk screen is a porous fabric base, covered with a non-porous film. The film cuts away leaving an open surface through which you press the ink. Multiple colors and runs.
9. Photo offset. Obtain a paper stencil from your printer. Draw on it or use instant press letters . . . anything you want. He'll run it off. Have more made than you think. Again the cost of setup time comes high.

This can be the most fun of the whole project and the least costly. Notice that this whole idea is directed towards your learning something at the same time as you help some group. It brings the handcrafted idea back into being.

So, if anybody says: "Let's make a record!" say yes, and really enjoy your recorder.

tape

TAPESPENDENTS WANTED

JOHN BORREGO, 1370 North Avenue 57, Los Angeles, Calif. 90042. Owns 400X and 700A, 3¾. Would like to exchange operatic tapes.

MR. JEROME DERDA, 382 Case Ave., St. Paul, Minn. 55101. Owns Sony 105, mono 7½. Interested in comedy recordings, letters by tape, pop, music-organ music.

GORDON DINGLE, 5221 Silver Arrow Drive, Palos Verdes Peninsula, Calif. 90274. Owns Ampex F-44, Viking 807, stereo 3¾. Interested in vocals, ballads, light classics.

BOB FERRIS, 324 South Third Street, Patterson, Calif. 95363, Owns Uher, Roberts, mono, 1⅞, 3¾. Interested in problems of extended ocean cruising on small sailboats, photography, ham radio.

SCOTT FOX, 6680 Bon Air Place, Hollywood, California, 90028. Owns Ampex 1150, Viking 88, Uher 4000. Interested in live broadcasts, opera, old radio programs.

JOY ELAINE HEIL, 1620 Valley Road, Fort Lee, New Jersey. Owns Wollensak mono, stereo, 1⅞, 3¾. Interested in psychology, good music, astronomy, photography and general happiness.

HARRY JAY, 5 Iona Street, Blackrock, Melbourne S. 9 Australia. Owns Uher Royal Stereo Reporter 4000, Telefunken 85, National 773S mono, stereo 3¾, 7½ ST. Interested in life recordings, theatre & cabaret show, nightclub programs, historical record. Will answer all tapes. Speaks English and German.

SSGT. GEARY JOHNSTON, Hq. Sq. Section CMR #1, Box 2678, Keesler AFB, Biloxi, Miss. 39534. Owns Concord 440 stereo, mono, 3¾, 7½. Interests are old radio mystery shows, recordings of: The Goon Show from England and Modern Jazz "Shorty Rogers—Lives."

JANET M. KELLER, 2141 Knox Ave., St. Louis, Mo. 63139. Owns Courier-Transcorder, mono 1⅞ 3¾. Interests: Girl Scout Leader, sewing, raise shelties (dogs), camping, gardening, wish to hear from other mothers (pre-schools to pre-teens). Family type tapes—recipes, trips, jokes.

JACK KRIEG, 206 Hewes Street, Brooklyn, N. Y. 11211. Owns VM #710, 1⅞, 3¾, 7½ ips, mono only 26 years old and single. Interests: 35mm color & 8mm color photography of—railroads, aircraft, ships, fire engines, etc. All stamps and picture postcards.

WILLIAM LASSITER, JR., 24 Sycamore St., Albany, N. Y. 12208. Owns Wollensak

5280 and 4100 Cassett., 1⅞. Interests: Radio broadcasts, finding a tapespondent who lives in McAllen, Texas.

AIC JAMES H. LILLARD, 1880 Comm. Sq. AFCS, APO San Francisco. 96320. Owns Dokorder, Roberts 1725. Prefer tapes in mono at 1⅞ or 3¾ ips. stereo at 3¾ and 7½ ips. Interests: tape recording, audio, electronics, radio (ham), photography. Interested in obtaining tapes of music, all types of popular, instrumental and groups. Stationed in So. Vietnam. Will answer all tapes and letters.

GEORGE W. LILLIE, 112 29th St. N.E., Cedar Rapids, Iowa 52402 mono 3¾, 7½. Interests: has sound service. All types of recorders. Interested in trading old time radio shows.

JAMES J. MARTIN, P.O. Box 221, Kinnaid, B. C. Canada. Anyone who knows of a tape on "The Galindez-Murphy Case" as broadcast by Ed Murrow on May 20, 1957, please contact.

ROY F. OEHLER III, P. O. Box 613, Titusville, Fla. 32780. Owns a Concord mono recorder and can record or play at all three speeds. Interests are: photography and stamp collecting. Would like to correspond with an English speaking person (s) outside the U.S.

JEAN OELLING, R.F.D. 11, Martell, Nebraska 68404. Owns Craig 910 stereo, mono, 3¾, 7½. Interests: Country and Western music, organ music, popular music, dancing and square dancing. Would tapespond with anyone. Would like some overseas.

REUBEN E. OLSON, 4456 Jackson St., Gary, Ind. 46408. Owns six varied recorders, stereo, mono, 1⅞, 3¾, 7½. Interests: Walls between nations and states "come tumbling down" through tape friendships; favor roundrobins on any subject anywhere!

(MR. & MRS.) CHARLES J. A. PIERCE, 217 W. 42nd St., Ashtabula, Ohio 44004. Owns Roberts and Ampex, mono, stereo, 3¾, 7½. Interest: Music & Oriental chit-chat. Couple humor.

E. F. REINER, 575 So. Saratoga, St. Paul, Minn. 55116. Owns Viking & Ampex, stereo, mono, 1⅞, 3¾, 7½. Interests: farming, electronics, aircraft, stereo, photography, metal and wood working, overseas tapes, sound effects.

ROGER H. RUSSELL, 7 Normandy Court, Binghamton, N. Y. 13903. Looking for someone in New York City area who can record FM programs clearly in exchange for equal time of old radio shows. Must be able to record day or night or with timer. 3¾ or 7½ ips, ½ or ¼ track.

Also looking for female tapespondents. General interests and discussions.

VINCENT SCAPARRO, 220 E. 89 St., N. Y., N. Y. 10018. Owns Ampex 1150 Sony 660, mono, stereo, 1⅞, 3¾, 7½. Interest: Jazz, sweet, swing. Jazz shows & records of all above—sell or trade—write for wants.

HARRY SHAW, 3275 B Magnolia, Lynwood, Calif. 90262. Owns Ampex 4450, Tandberg 6 and 64, stereo 7½. Interests: 4 tr. classical, opera, some popular, no jazz or rock and roll. Letter first.

GENE SHIRLEY, 12121 Centralia Road #41, Lakewood, Calif. 90713. Owns (2) Viking 88 ¼ track stereo, (1) Wollensak T-1500 ½ track mono. Interested in obtaining good copies of old radio shows, BBC's The Goon Show and Jeanette McDonald/Nelson Eddy material of any kind. Has similar material for trade.

CHARLES W. SMITH, JR., 463 Park Ave., Collingswood, N. J. 08108. Owns Panasonic RS7555, mono, stereo 7½, 3¾. Interest: English speaking foreign countries, winter skiing, travel, candid people, psychology, music.

ROB SPINA, 1920 Point Breeze Ave., Philadelphia, Pa. 19145. Owns Concord Solid State 700 mono, stereo, 1⅞, 7½, 3¾. Interests: all sports and plays all sports. Likes the English sound, science fiction movies and have several tapes of movies. Collecting voices of tv stars. Only collects things that are considered great.

ROBERT STARRETT, 5225 Lexington Ave., Hollywood, Calif. 90029. Owns Tandberg 64X, Uher 8000. Interests: Al Jolson & Judy Garland, radio broadcast recordings wanted. Have large collection of radio shows available for exchange. Will also purchase.

BILL STIVEIMAN, 550 Wamer Ave., Los Angeles, Calif. 90024. Owns Sony 777, 660, 350 Martel 201, stereo or mono 2 or 4 track 7½, 3¾ or 1⅞. Interests: classical

Name

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City

State Zip Code.....

Recorder(s)

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stereo 1⅞ 3¾ 7½ Other

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music, hi-fi bug. Interested in current events on the mideast, India and other lands. Would like to correspond with anyone young or old. Wants to keep a long correspondence of interest. Likes to record off the air off other tapes and off records. 11 years old.

RUSSEL S. SULLIVAN, 2187 Comm. Sq. Box 459, APO New York 09293. Owns Akai X355 mono stereo 3 $\frac{3}{4}$, 7 $\frac{1}{2}$ and 15 ips. I am presently stationed at Aviano Air Base, Italy and am interested in stereo and hi-fi sound effects, recording techniques and programming. Also original comedy recordings. Please send tapes via air mail.

LEIF THOMSEN, 4729 Fulton St. #5, Montreal, Quebec Canada. Owns Uher 4000 Report—L 1 $\frac{7}{8}$, 7 $\frac{1}{2}$ mono. Interests: recording big news events "on the spot" or "off the air," CB-Radio recording technique, music.

JAMES TOTH, 254 North Main St., Spring Valley, N. Y. 10977. Owns RCA Portable Mono Unit, mono, 1 $\frac{7}{8}$, 3 $\frac{3}{4}$. Interested in a girl tapespondent about 17 years old. Interested in British rock and roll tapes, travel and photography.

RICHARD TROUT, 918 Main St., Bethlehem, Pa. 18018. Owns VM 740 Symphonic R800 mono, stereo, 7 $\frac{1}{2}$. Interests: UFO's, Hypnosis S. F. ESP null—a music science hi-fi stereo tapesponding sound effects.

DON WALLACE, 7726 Morris Ave., Camp Springs, Md. 20023. Owns Roberts 720 mono, stereo, 1 $\frac{7}{8}$, 3 $\frac{3}{4}$, 7 $\frac{1}{2}$. Interests: electronic hobbyist, ham radio, sound recording (all kinds), radio and tv broadcasting. Will answer all tapes from anywhere. Adult.

STEVEN WASSERMAN, 462 Avenue P, Bklyn., N. Y. 11223. Owns Ampex 962, mono, stereo, 1 $\frac{7}{8}$, 3 $\frac{3}{4}$, 7 $\frac{1}{2}$. Interests: old rock & roll records, old r&r l.p.'s. Looking for fans of "The Platters."

LARRY T. SMITH, 415 Carolyn Court, Carv, N. C. 27511. Owns Wollensak 5250, Y-M 720, mono 3 $\frac{3}{4}$. Interested in radio recordings of 30's and 40's, sports, religion, jazz, circus & band music, travel—have travelled extensively with U. S. Navy. True ghost stories, football, baseball. All phases of electronics. Am an Electronic Tech. Maybe I can help you with technical problems. Adult.

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MISS LYNDIA WEISBLUM, 13320 Victoria, Huntington Woods, Mich. 48070. Owns Wollensak 1280, mono, stereo, 3 $\frac{3}{4}$, 7 $\frac{1}{2}$. Interests: boys, records, painting, coins & stamps, records, and tape recording.

Organ Music Enthusiasts. CARL WILLIAMS—secretary, 152 Clizbe Ave., Amsterdam, N. Y. 12010. Owns Revere Revox, mono, stereo, 7 $\frac{1}{2}$. Interests: popular organ, music from records or tapes or live pipe or electric.

Dept. of Misinformation . . .

(Continued from page 7)

for cassette recorders are made in the Netherlands and shipped to Japan for inclusion in sets to be sold under Japanese brand names, domestically, or in export markets. Some decks are made in England and sold in recorders completed in the U. S. under American brand names. There are recorders made in the Netherlands which are sold here under famous American brand names. There are other examples . . . too many to relate in these columns.

Before you go out and make that next recorder purchase, check on

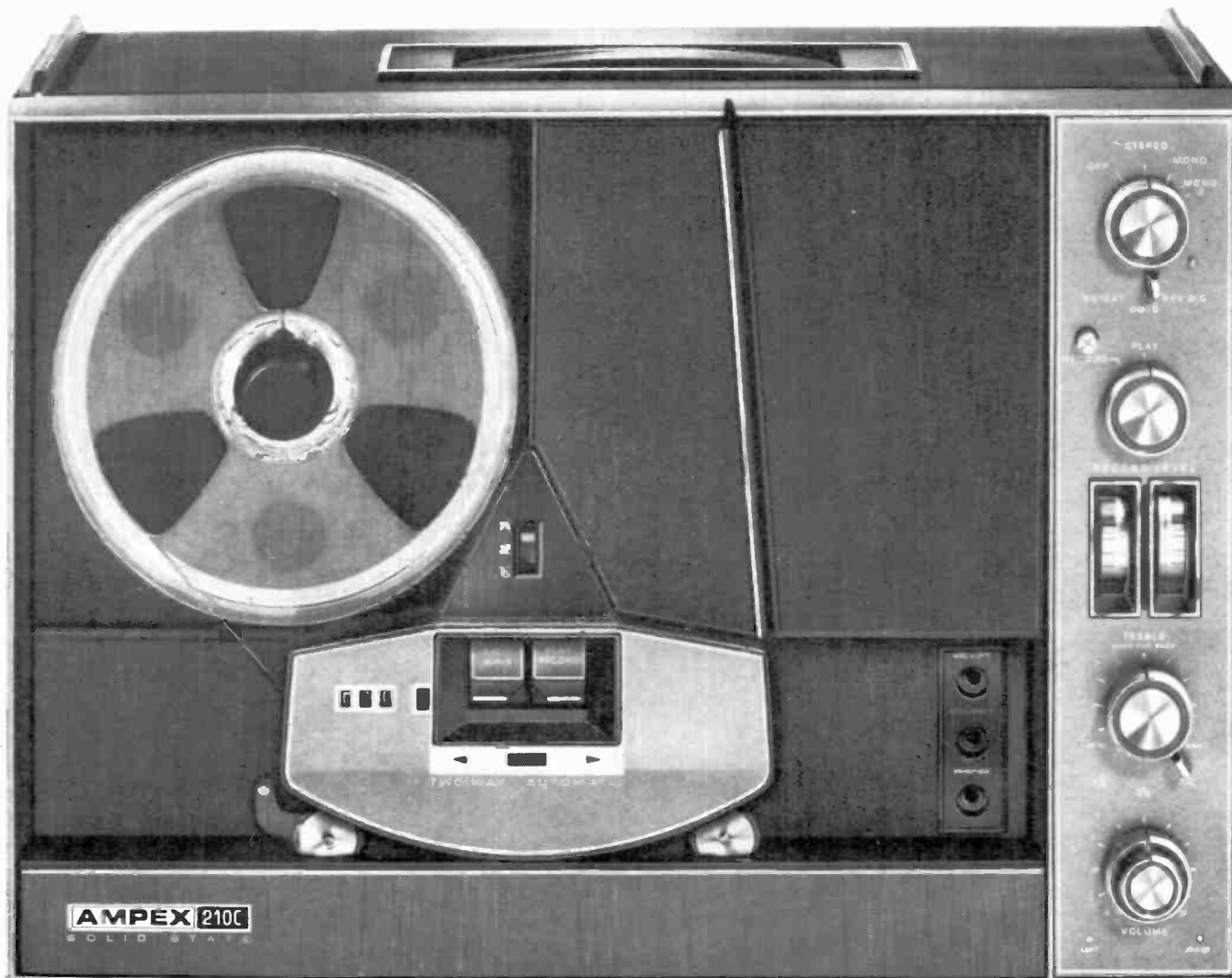
ADVERTISER'S INDEX and READERS SERVICE

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the store you intend to deal with. Do the clerks hem and haw when you ask a question, or do you get a quick, positive response? Do they try to field your questions to someone else? Do they go search for a piece of sales literature before they attempt to respond? Do they say that your question is not really important but that the low price they are offering on certain models is more important? Do they actually know how to operate smoothly and certainly a particular model you are considering? If the answer to these questions is NO, forget it . . . try another store. A store that is thoroughly familiar with tape recorders is the one where you stand the best chance of making a satisfying purchase. The more the store knows about recorders, the better able it is to fill the needs of prospective purchases. By FRED PETRAS

This is the finest home tape recorder Ampex makes.

(If you can find anything we've left out, please write.)



This Ampex 2100 tape recorder player threads itself, reverses itself, and offers bi-directional record and playback... so you can sit back and enjoy a complete 4-track tape without rewinding reels. Or changing reels.

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Concerning construction: It offers dual capstan drive for perfect tape-to-head contact to practically eliminate wow and flutter, even at the slow speeds. You also get twin VU meters, monophonic mix, and die cast aluminum construction. We think so much of the way it's built we offer an exclusive one-year warranty on both parts and labor.

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Stand Adaptor.

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SA-10 Stand
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cable.

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SPECIFICATIONS: Frequency Response: 25 to 20,000 Hz ■ Impedance: Variable, 200 and 20,000 ohms (wired at the plug.) ■ Sensitivity Rating: -147 db (EIA) ■ Output Level -200 ohms: -54 db/ 1 mw/ 10 microbar. 20,000 ohms: 13 mv/ 10 microbar ■ Dimensions: 2 3/16" max. dia., 9 5/8" max. length (Model 5050) ■ Shipping Weight: 2 1/2 lbs. ■ Finish: Satin Chrome.



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