

BUILD YOUR OWN RECORDER



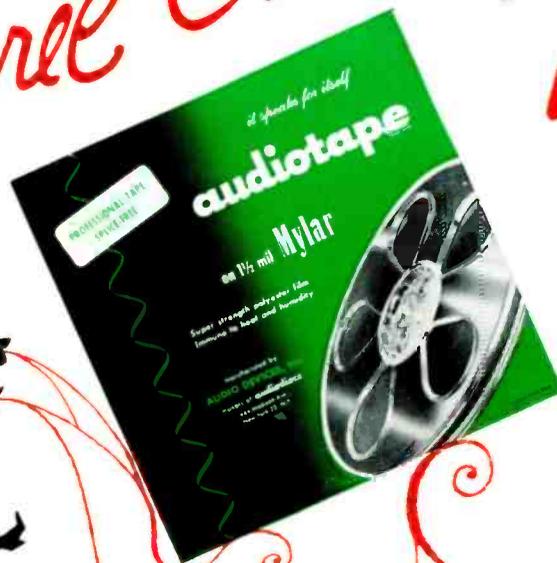
# TAPE RECORDING



Mr. Roy Perrin  
231 Williland Ave.  
Rutherford, N.J.

From now until  
Jan. 15, Audiotape  
offers a ...

# Free Christmas Bonus



**FOR ALL  
TAPE  
RECORDISTS**

*A 1200-foot reel of Audiotape on super-strong 1 1/2-mil Mylar\* is your free bonus with every purchase of four 7" reels of any type of Audiotape*



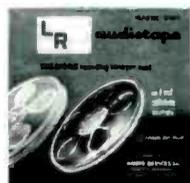
PLASTIC BASE  
AUDIOTAPE  
on 1 1/2-mil acetate



AUDIOTAPE  
on 1 1/2-mil "Mylar"



LR AUDIOTAPE  
on 1-mil "Mylar"



PLASTIC BASE  
LR AUDIOTAPE  
on 1-mil acetate



SUPER-THIN  
AUDIOTAPE  
on 1/2-mil "Mylar"



SUPER-THIN  
AUDIOTAPE  
on Tempered "Mylar"



MASTER  
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MASTER  
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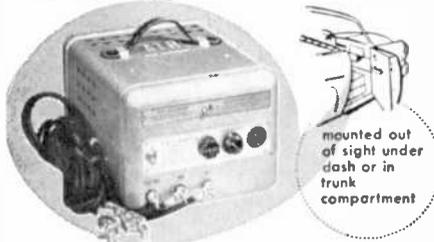


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## HI-FI

# TAPE RECORDING

VOL. 6 NO. 2

JANUARY 1959

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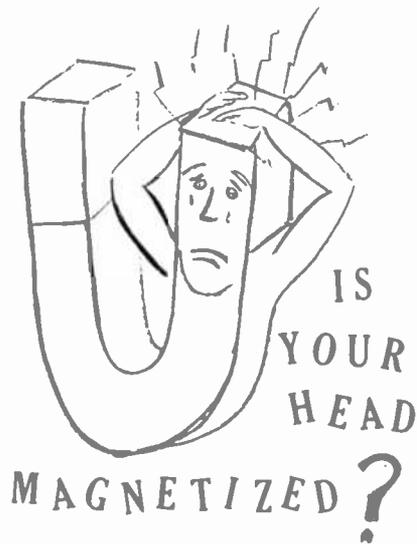
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## TAPES TO THE EDITOR

When sending tapes to the editor please use the 3" reel and indicate the speed at which it was recorded and whether it is dual or single track. We will listen to your tape, make notes from it for use in this column and then reply on your tape. Please keep tapes reasonably brief.

If you do not own a recorder, a letter will be acceptable. Address tapes or letters to: The Editor, Hi-Fi TAPE RECORDING, Severna Park, Md.

### Time Program Indicator

To the Editor:

In the article "The Index—What It Is and How to Use It" by Karl A. Windesheim, inserted in your magazine September 1958, page 24, the following is written:

"The program indicator on a modern tape recorder does not count either footage or elapsed time. In order to show footage or elapsed time the indicator would have to be driven by the drive capstan or the idler puck. While this could be done, such an arrangement would be complicated and costly and, so far as I know, there is no semi-professional tape recorder which is so designed."

For your information the Tape Recorder Luxor introduced on the market in 1957 was equipped with i.a. a time indicator of the type described above and which is still in use. The indicator is driven by the pressure roller via a worm gear.—L. Larsson, Luxor Industry Aktiebolag, Motala, Sweden.

### No Stereo for Him

To the Editor:

As a reader of HI-FI TAPE RECORDING I just thought I would send you these few lines. I am not interested in the trend toward stereo. Listening to stereo and being deaf in one ear has its limitations. I therefore specialize in recording music and commentary from the BBC and other foreign stations. I have a Hammerlund receiver and a Wilcox-Gay recorder.

On my trip to Europe in May I had the pleasure of visiting Bush House of the BBC from which over-seas services originate. For the most part, programs are recorded on tape to be presented at the proper time for the countries in question. The BBC, wishing to keep its standard high sends out to its listeners questionnaires about programs received.

I might say that when possible I try to purchase materials and supplies from your advertisers. Keep up the good work. All best wishes for the coming Christmas Season.—John Carter, Brooklyn, N. Y.

*Thank you for your good wishes and may we say the same to you and to all our readers. Recording foreign broadcasts can be a very rewarding hobby, especially if one is studying a foreign language.*

### Likes Sheldon O'Connell Articles

To the Editor:

I thoroughly enjoy reading your magazine and the November issue is no exception. Each article has a great deal of merit and I wish to heartily congratulate you and the rest of the staff on all the interesting articles it contains.

I believe the articles that interest me the

most are those written by Sheldon O'Connell. His "Tape Close Harmony" was very good and his June article, "How to Build an Isolation Booth" was equally interesting and very constructive. Again, congratulations for a fine job.—Mrs. E. Russell Focht, Pottstown, Pa.

*Thank you for your kind comments. We agree that Mr. O'Connell does a fine job in his articles and we will be having more of them.*

### Wants Russian Record

To the Editor:

I will appreciate very much your publishing this letter, with which I am trying to locate someone who owns a Russian record (MVL label) of Arensky's Violin Concerto. I am collecting recorded violin concerti (have 164 already) and am trying to add this one. I am willing to buy the record, rent it for taping or buy a tape copy of same.—O. Porrata Doria, College Station, Mayaguez, Puerto Rico.

### Hot Recorders

To the Editor:

An experience I recently had with the purchase of a tape recorder may be of interest to your "New Product Report" staff as well as to your readers contemplating the purchase of a recorder.

I selected a particular "home" recorder in the upper price bracket because of the consensus of excellent reports about it appearing in a number of publications, including your own. The criteria for evaluating these machines are fairly universal and all agreed that this model met them adequately.

However, there are two very significant factors about recorders to which none apparently pay any attention—the temperature of the deck and reel spindles after an hour or so of normal operations and the noise level of the motors themselves and the associated parts which may be resonating as a result of the vibrations set up in the motors.

I purchased my original recorder about three weeks ago. When I complained of the excessive temperature of the deck and spindles (over 120 degrees after one hour of operation) and the high level of mechanical, motor-generated noise, the dealer replaced it with another machine of the same make. This proved to have the same faults as the first. Again he substituted another machine. I have just returned the third one for the same reason after having it checked by the manufacturer's service representative. This man was good enough to admit (confidentially) that the faults I complained of could not be remedied; they were inherent in the design of the equipment.

I need not point out what damage continued high temperature can do to electronic components, tape and reels. Of at least equal importance is the amount of mechanical noise which a recorder produces in a noise-free room. Noise tests have generally been confined to the electronic system. The apparatus with a maximum signal-to-noise ratio or a low amplifier hum level is absolutely valueless if its mechanical parts produce spurious sounds of sufficient volume to be picked up by the microphone under ideal recording conditions.

I am a volunteer recordist of books for the blind and, wishing to turn out as clean a recording as possible, wait for the family to retire at night so that I may work in a noise-free room. I sit at a table as I read and need to have the recorder within reach to operate the controls. Even at a distance of six feet from the machine, the microphone is able to pick up the motor sound. I have tried acoustically shielding the microphone, damping the recorder support and acoustically screening the machine—all to no avail.

In summary, I wish to suggest that before buying any recorder, prospective purchasers add the following two tests to whatever others they consider using and thereby save themselves aggravation afterwards: 1—Run a tape on the machine for at least one hour. Then check the temperature of the deck, the reel and the reel spindles. This can be done with the hand. Some heat is to be expected. If these parts are excessively hot to the touch, reject the machine. 2—Run the machine in a "dead quiet" room with the controls in the record position and listen for mechanical noises and hum at varying distances from the machine. The sales room of a store is never "dead quiet" regardless of how little apparent activity is going on and it therefore does not duplicate such a sound-free room as one would work in at home. Ask the salesman to perform this test for you in a sound-proof room.

I would also like to suggest that the above tests be applied to equipment being judged for your "New Product Reports."—*Irving Pollack, Westbury, L. I., New York.*

*We'll keep these points in mind in future reports.*

#### Recorded Sermons

To the Editor:

The Dawn Bible Students Association has several tape recordings of sermons including congregational singing, scriptural reading and sermon. They are desirous of making these recordings available to more than the shut-ins of our own congregations. These recordings will be supplied without charge to those who request them on a loan service. A small charge will be made if they decide to keep the recording for their own file. This charge will be only for the replacement cost of the recording tape.—*G. R. Pollock, 4434 Victoria Park Place, Los Angeles 19, Cal.*

*Anyone desiring these recordings please contact Mr. Pollock directly—Ed.*

#### THAT'S RIGHT—

That crazy, mixed-up announcement we've been promising is still not ready. Just keep a crossed-eye on the lookout. We'll get it in.

**REPULSIVE RECORDINGS**  
Severna Park, Md.

#### Agrees With Dahlberg

To the Editor:

I had a lengthy and rather verbose letter nearly completed in regards to Mr. Philip J. Dahlberg's letter in the October issue.

I threw my letter away when I received my copy of a radio magazine which better described what I had in mind.

I've found that both yourself and Mr. Dahlberg were correct in the statements made.

I'm for keeping an eye on Mr. Manufacturer to see what he does, see what your tests prove in the "New Products Report" column and in general keep in close touch with progress. Then we, as Mr. Consumer, Mr. Stereophile, Mr. Audiophile and Mr. Hy-Fye can draw our own conclusions. Time is the best test in matters of radical new products. Let's give them time. Meanwhile, Mr. Dahlberg's last sentence "... keep going along with the best in high fidelity . . . two channel stereo at 7½ ips . . ." gets my vote.—*N. G. Giguac, Brooklyn, N. Y.*

#### Two Track-Four Track

To the Editor:

As a very interested reader and subscriber of your magazine, I read with great interest the article on the four track system and the answer to Mr. Dahlberg's letter in the November issue.

Thank the gentlemen who replied, it was beautifully done.

One point was not clear to me and I would appreciate an answer. When transferring from a two track stereo head to a four track head are the two track tapes still useable? I cannot see why they should not be but I want to be sure because I have quite a library built up.

My present equipment consists of Pye amplifiers, two British large balanced speakers, Pye radio amplifier, Garrard disc turntable and a Revere recorder with a two track stereo head.

All this is built into a system and jacked to do disc or radio recording over wire and play back standard stereo discs, radio, etc. Quite expensive and good set-up on today's standards. Should I put a four channel head in the Revere recorder? I shall very much appreciate your opinion. — *Arthur G. Lambert, Welland, Ontario, Canada.*

*If a four track head is put in a recorder there will be some loss in volume and a lower signal-to noise ratio than with the two track heads now employed. Claims have been made that the new four track heads, because of improved construction, will perform as well as present two track heads at a lower speed. Since we have not tested this assertion we can make no statement about it one way or another. So far only two companies have announced four track tapes and RCA will have available four track tapes in cartridges. The tape may be removed from these and played on a reel-to-reel machine. We have not received any announcement of a four track head kit being put out by the manufacturer of your recorder. As to installing a four track head in your present machine, you may do so and still be able to play the two track tapes you have, as noted above. Whether or not it is desirable to do so at this time will depend upon the amount and availability of four track material to play on the recorder.*

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"... does not degrade or change the quality of an LP dubbed on tape."

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**The Ferrograph Stereo 88** is designed for both recording and playback of stereo tapes. Professional quality twin-recording amplifiers and playback pre-amplifiers are inbuilt. Monaural recording/playback on both tracks is also possible.

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## QUESTIONS & ANSWERS

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

**Q**—I am a violinist and interested in fine quality recording of violin and piano. I own an Ampex 601 recorder and a Telefunken microphone. I find that the acoustics of the average room do not give results comparable to professional recording and wonder if you have any suggestions as to improving the acoustics of a low-ceiling room. I would be interested in knowing the set-up used by the leading record companies, such as mike placement, dimensions of room, acoustical material used, etc., when recording piano-violin sonatas. Perhaps some of your readers have used the Telefunken and can give some hints on the subject. With the equipment I have, do you feel that I am losing much fidelity in recording at 7½ ips instead of using a machine that would go to 15 ips?—S. C., Charlotte, N. C.

**A**—Your equipment is of the very finest and while you would gain by recording at 15 ips instead of 7½, the difference would not be especially noticeable unless your reproducing equipment was also of the very best. As you know, professional recording is done at the 15 ips speed.

We believe your problem is more one of acoustics and microphone placement rather than equipment shortcomings.

As to the studio conditions on the recordings, these are very often jealously guarded by the companies. Some have located just the right auditoriums to get the sound they want and will record in no others. They spend many hours getting the optimum pickup and mike placement before doing the actual recording.

Each room is different and some experimentation is necessary to arrive at the best conditions.

If your room has hard walls and floor you probably are having difficulty with sound reflections which will tend to destroy the sharpness of a recording. If this is the case, quite an improvement can be made by covering the walls with draperies and putting a rug on the floor. An acoustical tile ceiling, which is easily applied, will also help.

Usually the mike is placed near the bass end of the piano, whether it is either an upright or grand. The distance will depend upon whether the top is up on the stick or lowered. It is sometimes helpful, with an upright piano, to open the top and place the microphone rather high.

The violin should be positioned so that the center of the sounding board faces the center of the microphone if the piano is to be subordinated. If each is to share equal prominence, then the mike should be positioned to give an equal pickup. As the violin produces considerably less sound than the piano it should be closer to the mike or more centered on the beam than the piano.

If you are using a grand piano on a

hard floor, it sometimes helps to place a rug under the instrument.

**Q**—I wonder if you could give me some information concerning my RCA tape recorder? My problem is this: there was an attachment that came with my recorder that enabled me to clip one end to the speaker part of my portable TV where I could record programs. For about two months it was working just fine but here lately when I record a program from this setup I get a screeching sound. I wonder if it could be either the tape was getting old or something was wrong with the attachment itself? Also I would like to know the life span of any tape and how do you recognize the fact that the tape is getting old?—M. D. H., Colorado City, Texas.

**A**—You did not state in your letter whether the squeal is an electrical squeal, coming from the loudspeaker, or a mechanical squeal from the recorder. We're more or less suspect that the latter is the case and suggest you clean the pressure pads or replace them. If they have become hardened or glazed, they will make the tape squeal like chalk on a blackboard. The pressure pads may be cleaned with any cleaning fluid, such as carbon tetrachloride, or one of the commercial cleaning fluids and then should be rubbed with a nail file to restore the nap of the material.

If one of the cleaning solutions containing silicone lubricants is used, it will help to hold down trouble from this source in the future.

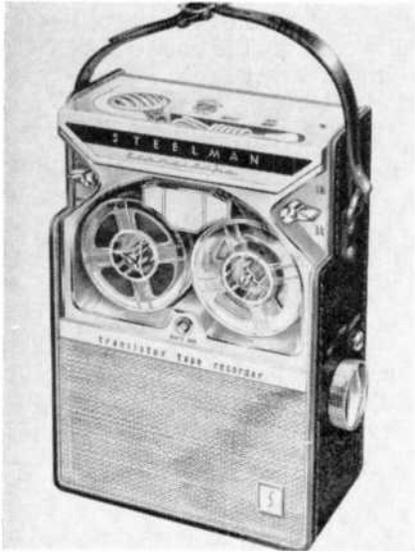
Regarding tape life, it is indefinite. Tape should be stored at room temperature and if it is to be stored for long periods it should be placed in metal cans and sealed to prevent changes in humidity from affecting it. If it should dry out and become brittle, it should be placed in a can with a damp blotter and left overnight to restore its limpness. If Mylar base tape is used no precautions are necessary.

Tape may be recorded, erased and recorded again any number of times.

In regards to the bulk eraser which G.W. of Wilmington, Cal., built, I believe his trouble is probably due to something else than what you stated. The first bulk eraser I made (according to the directions) produced the same effect as G.W.'s eraser. I took that eraser to a radio technician and asked him if he knew the cause of the trouble. He said it was due to the fact that the transformer I had used did not have enough turns of copper wire on the coil (even though it produced what seemed to be a strong magnetic field). He said it would be easier to build an entirely new eraser from another old transformer, so I let him do it. It worked.—David Thomson, Kyoto, Japan.

# NEW PRODUCTS

## STEELMAN PORTABLE



A new portable recorder-player weighing just 5 lbs. has been introduced by Steelman Phonograph & Radio Co., 2-30 Anderson Avenue, Mount Vernon, N. Y. It has speeds of  $1\frac{7}{8}$  and  $3\frac{3}{4}$  ips and runs on standard mercury penlight batteries with conventional three inch reels and tapes. An extended range four inch Alnico P.M. speaker gives rich, full console tone. The output jack may be used with earphone or mike for private listening or with large external speaker or auditorium playback. This compact recorder comes in a genuine leather case—black or tycoon tan—and measures  $2\frac{7}{8}$ " x  $6\frac{1}{2}$ " x  $9\frac{3}{4}$ ". The retail price is approximately \$200. Contact Steelman for complete particulars.

## NEW IRISH PACKAGE



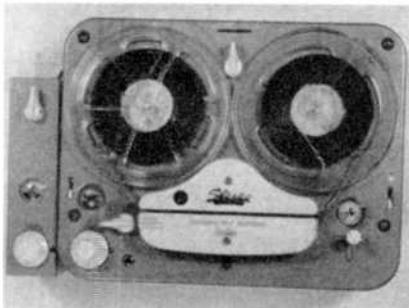
Irish tape is now appearing in a new package. It is in an attractive new three-color box which lends itself to the decor of any home. The cover pattern has gold circles which ring an alternating green-and-white pattern which forms the background for the copy. It also features an acetate window revealing the tape inside. On the back of the box is space for cataloging the reel of tape by date, subject, recording speed, and length in minutes and footage. All boxes carry the Guarantee Certificate which outlines the unconditional guarantee which goes with every reel of Irish tape. Contact the manufacturer for details and price.

## AUDIO "ECHORASER"



Audio Devices, Inc., 444 Madison Ave., New York 22, N. Y. has introduced a simple and inexpensive "Echoraser" which removes print-through from valuable "echo-ridden" tape recordings. It consists of an upright chromium-plated brass bar,  $1\frac{1}{2}$ " x  $\frac{3}{8}$ " x  $1\frac{1}{4}$ " in size, with a small energized area. The bar fits snugly over a  $\frac{3}{4}$ " base plate permanently installed on a tape transport over which passes the moving tape. The "Echoraser" package consists of two erasers each with a different power of energized area. For price and complete information, contact Audio Devices.

## TANDBERG 3-SPEED STEREO



Tandberg of America has announced a new 3-speed stereophonic tape recorder with complete facilities for the playback and recording of 4-track stereo and monaural recording and playback. It also plays back 2-track stereo and  $\frac{1}{2}$  track monaural tape and  $1\frac{1}{4}$  track monaural tape. Designated model 5-2, this machine numbers among its many features two matched built-in pre-amplifiers and power amplifiers; a special stereo input jack permitting the use of the 2 built-in matched stereo amplifiers as audio amplifiers for stereo discs or stereo broadcasts; and a special selector switch which connects the tape electronics to any track or tracks and permits 4-track stereo or monaural recording or playback without having to rewind. Frequency response is from 30 to 18,000 cycles at the various speeds. For price and details, write to Tandberg, 10 East 52 Street, New York 22, N. Y.

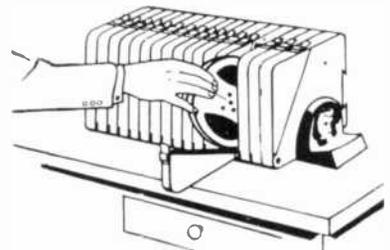
(Continued on page 31)

# A SOUND APPROACH TO BETTER SOUND...



in the permanent plastic container

Why settle for ordinary tape when Sonoramic offers you so many exclusive extras. By combining the finest materials and processing techniques with the highest research and technical skills Sonoramic brings you a magnificent tape that will brilliantly reproduce the total recordable frequency spectrum.



**1. CASE:** Shatterproof plastic container for permanent protection; stores anywhere on wall, bookcase or table for easy access.

**2. REEL:** V-slot permits jiffy self-threading. Permanently imprinted with Selection-Finder and easy write-on surface.



**3. INDEXING:** Case includes pressure sensitive front and side labels. Permits type-written tabs of all recordings.



**FREE:** Tape-time ruler indicates footage and recording time. Write Dept. 21

*Ferro*dynamics CORPORATION,  
Lodi, New Jersey

# CROSSTALK

from the Editors

TV VIEWERS watching the DuPont "Show of the Month" on December 18 will see a three minute commercial on tape recording. Commercial details how Mylar base, a DuPont product, brings to home type tape recorders the same features it offers in instrumentation and automation. Show will be telecast at 9:30 P.M. Eastern Standard Time over a CBS net of 146 stations. Title of show is "The Hasty Heart" and stars Don Murray.

\* \* \* \* \*

\$6,000 WORTH of Tandberg Tape Recorders were stolen from Tandberg's Long Island City warehouse recently. Dealers have been advised not to buy any recorders on which the serial numbers have been altered or are not legible.

\* \* \* \* \*

A FEW months ago we thought we had heard of the ultimate when we described a 1,000 watt speaker with a 24 pound magnet that operated at 500° F. and weighed 150 pounds. Now comes word from Bogen-Presto of a unit they have developed for the Air Force. The prexy of Bogen and the police chief jointly warned surrounding communities not to be alarmed when tests were conducted of one of the most powerful hi-fi systems ever built. Called "Homer" by those who know it best, the unit has 152 amplifiers and 76 speakers, all of which can be beamed at a given area. Capacity of the system is 9,000 watts. It will produce a warbling tone at a level of 140 db 30 feet away on the beam and 115 db a quarter mile away. This level can actually cause pain. System will be pointed skyward during tests to avoid any possibility of harm to persons. Perhaps the Civil Aeronautics Board should make area a restricted zone during tests so a low flying plane won't be shot to Mars on the beam. Now—who has a bigger one?

\* \* \* \* \*

CAL-WESTERN STEREO of San Jose, California has just released their first stereo tape featuring three west coast groups. The tape is Rock and Roll and Blues music. It has the beat and should go with the rock and roll crowd. If you have a bopster in your home who refuses to listen to your long-hair stereo, this should send him. To the best of our knowledge this is the first stereo tape aimed at the record buying rock and roll fans.

\* \* \* \* \*

TAPE-RESPONDENTS International will shortly conduct the first tape contest ever held in this country. The competition will be open to TRI members and will be known as "Sounds of Our World" Contest. Full details can be had from Exec. Secretary Jim Greene at P.O. Box 416, St. Louis 66, Mo.

\* \* \* \* \*

AUDIO DEVICES is now readying another 20,000 square feet of area for the manufacture of magnetic tape at its Stamford plant. Instrumentation tape sales are zooming ahead so fast plant cannot keep up with orders.

\* \* \* \* \*

ELECTRONIC INDUSTRIES Association has appointed a committee to study standards for the transmission of stereo broadcasts. Plan is to study all present systems, have one approved by the entire industry and then present it to the FCC for approval. The problem is similar to that which produced the standards for compatible TV.

\* \* \* \* \*

AUDIO ENGINEERING Society west coast meeting scheduled for February 17 through 20 at the Hotel Biltmore in Los Angeles will have the greatest number and highest quality of audio papers ever presented at one of their meetings.

\* \* \* \* \*

WEEKLY TRADE paper has story headlined "Pre-Recorded Tape in Topeka Not Available." Goes on to mention one dealer said "there had been hardly any demand for them." Another dealer is quoted as saying "he had only two inquiries about pre-recorded tape since it was first available." Wonder if anyone has impressed dealers with fact that tapes can be sold if demonstrated?

# TAPE CLUB NEWS

## New Officers



J. Maurice Roussel, Secretary-Director of the Bilingual Recording Club of Canada has announced the following club appointments. Ernest A. Rawlings, Technical Advisor; J. P. Paquette, Publicist and Recruiter (pictured above); and C. A. Coulombe, Management Advisor and District Director.

## JOIN A CLUB

### TAPE RESPONDENTS INTERNATIONAL

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

### THE VOICESPONDENCE CLUB

Charles Owen, Secretary  
Noel, Virginia

### WORLD TAPE PALS, Inc.

Marjorie Matthews, Secretary  
P. O. Box 9211, Dallas 15, Texas

### AUSTRALIAN TAPE RECORDISTS ASSOC.

Jack A. Ferry, Federal President  
Springbank Rd., Clapham, S. Australia

### UNITED RECORDING CLUB

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

### THE BRITISH AMATEUR TAPE RECORDING SOCIETY

Ted Yates, Secretary  
210 Stamford Road  
Blacon, Chester, U. K.

### AMERICAN TAPE EXCHANGE

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

### BILINGUAL RECORDING CLUB OF CANADA

J. P. Paquette, Recruiter  
1993 Morgan Boulevard  
Montreal, Quebec, Canada

### CLUB DU RUBAN SONORE

John-Paul Barabe, Publicity  
1274 St. Elizabeth St.  
Montreal, P. Quebec, Canada

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

As the club continues to grow, other district directors will be appointed. The Bilingual Recording Club of Canada is the only Canadian tape club which is bilingual. For more details, contact Mr. Paquette.

## Cornballs

Voicespondent member, Dennard Owen of Texas, has pointed out some of the pitfalls all taping club members should avoid falling into. His use of the term "cornball" applies to this type of person. We believe members of all clubs will recognize some of the cornballers mentioned.

A cornball (1) Does not enclose a self-addressed postcard and makes return address illegible. (2) Is slow in sending the first tape (even slower with subsequent ones). (3) Is superior. Gives the idea that he knows it all, and refuses to make notes on a tape to help confuse the answer more. (4) Plays the type of music the sender dislikes most. (5) Always makes a lousy recording. (6) Places insufficient postage on the tape package. (7) Gripes and complains about the people who direct and manage the club. (8) Fills the tape with music and then at the end says "I wanted to tell you something important, but there isn't time now." (9) Uses nothing but cracked reels and mails in shoddy packages. (10) Speaks in a monotone.

There is, unfortunately, even more such cornballism within clubs, and we hope that those reading this will attempt to lower the boom on such lazy folks, so that the true friendly spirit of tapespondence communication is not lost.

## Canadian Tapevention

The Canadian tape club known as Club Du Ruban Sonore is expanding rapidly, and just recently held a tapevention which 39 members attended, some from the United States. At the meeting, committees were formed for the welcoming of new members and the drafting of club rules and regulations. An information center was also established for the gathering of inquiries and complaints.

Last August this club issued its first directory of members, in ink-print, braille and on tape. An autumn supplement will soon be out. Anyone interested in joining is invited to write to John-Paul Barabe (see address in box).

## Tapers Gathering

The 4th annual get together of Tape friends of Dick Kenny (The Crazy Tape-worm) was held on Saturday, October 4th at the Victoria Hotel in New York City . . . followed by a "do it yourself" dinner at the Stockholm Restaurant. Among the well known tapeworms present were: Kurt Graf of Glen Rock, N. J., Kenneth Miller of New York City, Paul Stillwell, Washington, D. C., Roger and Eunice Lent, Norwalk, Conn., Betty Ketty, Hartford, Conn., Thomas Bradford, Arverne, N. Y., and the hosts, Helen and Dick Kenny, Stamford, Conn.



**ROBERTA PETERS**  
tapes her own  
recordings on



That alone is not  
the reason why  
you should use



Here's why  
you should use



It's the best-engineered tape in the world . . . gives you better highs . . . better lows . . . better sound all around! Saves your tape recorder, too - because the **IRISH FERRO-SHEEN** process results in smoother tape . . . tape that can't sand down your magnetic heads or shed oxide powder into your machine. Price? Same as ordinary tape!



Available wherever quality tape is sold.  
ORRadio Industries, Inc., Opelika, Alabama  
Metropolitan Opera star Roberta Peters is under the  
exclusive management of Hurok Attractions, Inc.

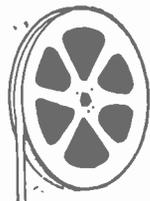
## USED RECORDING TAPE (PLASTIC BASE)

ATTENTION: Radio Stations, electronic calculators, industrial users: We have the new 1/2 or 2 mil mylar "sound-plate," "lifetime," or "P.E." tapes and we will buy or exchange your present 1 mil mylar or plastic tapes.

1.19 for 7"—1200 ft.  
.61 for 5"—600 ft.  
.37 for 4"—300 ft.  
.20 for 3"—150 ft.

## USED "MYLAR" TAPE (1 Mil)

300 ft. (3" reel) .... .43  
900 ft. (5" reel) .... .1.09  
1800 ft. (7" reel) .... .2.09



New empty plastic reels in boxes: 3" 10c; 4" 22c; 5" 24c; 7" 25c; 7" (4" hub, holds 1000 feet only, 49c); 10 1/2" fiberglass 1.49; 10 1/2" metal 2.24.  
EMPTY BOXES, 3" 3c (folding type); 3" 2-cover type; 5c; 4" 5c; 5" 5c; 7" 5c ea.

Send for new Price List. "Tape Recording" magazine and back issues available.

\*\*\*\*\*

## SPECIAL SALE!!

**NORELCO (Philips)  
TWIN CONE PM SPEAKERS  
UP TO 65% OFF LIST!!**



8" model, 9770  
LIST 16.50

NOW **578**

(6-10 Watt Peak, 75-19,000 Cycles)

Other Norelco Speakers from 8-12 inch in stock at similar sensational savings!! Full specifications & speaker catalog FREE!!

Please Include Sufficient Postage

COMMISSIONED ELECTRONICS CO.  
1776 Columbia Road, N.W., Washington, D. C.

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**RADIO & TV  
ANNOUNCER**



Earnings of Radio and TV announcers, sportscasters, newscasters, and disc jockeys are fabulous. Train now for one of these glamorous jobs while the demand is at its highest. Many more jobs than applicants means immediate placement after your MIDWESTERN extension course. Personal "Tape" contact with your instructor. Two weeks resident study at end of course. Write now for details.

## LEARN AT HOME WITH YOUR TAPE RECORDER

Yes, your entire course is conducted in the privacy of your home, at your learning speed. Your assignments recorded on tape. Recorded criticisms and demonstrations returned by YOUR OWN instructor on same tape. All instructors top professionals. Send today for EXTENSION CATALOG #117.

MIDWESTERN BROADCASTING SCHOOL, Dept. 20B  
228 S. Wabash Avenue, Chicago 4, Illinois

## TAPE RECORDERS



HI-FI COMPONENTS  
SLEEP LEARN KITS

MERITAPE  
Low cost, high quality  
recording tape, in boxes  
or cans. FREE  
1959 CATALOG

DRESSNER, 69-02 AA, 174 St., Flushing 65, N. Y.

## TEEN TAPERS

BY JERRY HEISLER



**D**URING my course of time selling tape recorders and advising teens on the use of them, I've often been asked, "What accessories do you suggest?" Of course there is no definite answer to such a question and it all depends upon what the person would like to get out of his recorder. I myself usually purchase every possible accessory available since I am by nature, a gadget hound and my room abounds with odds and ends that make sense to only the initiated.

But what can we suggest in a concrete way? I would first of all purchase as good a microphone as I could afford. Without exception, all tape recorders come equipped with low priced microphones. This is as it should be and is not an attempt on the part of the manufacturer to defraud you. Since most recorders are sold to popular priced markets for use in homes, an expensive microphone would raise the price up. For most normal uses of a recorder the microphone that comes with it will be adequate.

But most teens like to explore and discover new methods for using a recorder. They will soon discover what a difference a better microphone will make.

A good sturdy stand for the recorder should come high on the list of accessories. There are several stands on the market made exclusively for recorders, but I myself prefer a typewriter table with wheels. This can be had for less than \$10 and will enable you to move your recorder about quite easily.

Twenty-five feet of extension line should be obtained for both your microphone cord, and your line cord. This gives you an added 50 feet of flexibility. I recommend only 25 feet of each type for a good reason. Most high impedance microphones will begin to hum when long lengths of cord are used, hence keep your microphone cord to 25 feet. However by having your recorder on a table with wheels, and having a long electric cord, there is nothing to stop you from moving your entire recorder to the scene of recording.

I would next suggest a good splicing kit. There are several complete kits on the market or you can piece together the components. This kit should include a good mounting jig of some type, a roll of splicing tape, a roll of leader and timing tape, a pair of non-magnetized scissors, and a booklet on how to edit tape. This set can be one of your most useful tools both in taking care of your reels, and in editing them and making them more listenable.

Back to microphones again. I would suggest the purchase of one or more microphones of exactly the same type as

come with the recorder. Usually the manufacturer will provide these or a parts house such as Allied Radio will furnish them. They usually run between \$5 and \$10. They are useful when recording a large group. I emphasize the fact that they should be exactly like the one that comes with the recorder since if they are not matched correctly they will not function properly.

If you are to use more than one microphone you may ask how you can plug them in. This requires a microphone mixer. A mixer is a device that allows you to mix several microphones. You plug the mixer into the recorder, and the microphones into the mixer. These come in two varieties. Electrical and passive. An electrical mixer provides amplification which is needed when several microphones are being used in a recording that requires exact loudness control. A passive mixer is merely a set of volume controls without amplification or electric power of any kind. This will suffice for most jobs. Cost is less than \$10. Back issues of Tape Recording have shown how to construct both types of mixers.

How about playback? Most recorders, because of size limitations use small speakers. These speakers, small though they are, give surprising results, but we can do better still. Most recorders provide a jack for plugging in an external speaker. I would recommend the purchase of a 12 inch speaker in a suitable baffle. You will be surprised at the amazing difference a big speaker can make in the sound you achieve. Especially is it noticeable on a recorded tape.

Such a speaker can run as little as \$10 or as much as several hundred, but \$25 should suffice. A tip for you money minded teens. Often you can find a big speaker in an old console phonograph or TV that can be adapted. Talking about TV, you can also run a wire from your recorder to your TV speaker and play through it. This should only be done with a console since table size models probably don't have any bigger speakers than the present one in your recorder.

This covers most of the big items, but how about odds and ends. Most teens like little gimmicks I think, so here are some.

A bottle of head cleaning solution, several small screwdrivers for making adjustments, some extra tubes in case of emergency, a stop watch for accurate timing, a grease crayon for reel identification, half a dozen colored reels, and several colors of tape (Audiotape provides these) to add interest to your reel make-up.

And last but not least pick up a subscription to *Tape Recording*, and a couple of good books on recording and you are a teen equipped for recording at its finest.

## EVERY RECORDIST NEEDS

# V-M'S NEW TAPE EDITING KIT!

a practical necessity . . . and the perfect gift!

Everything you need to make professional-quality tape recordings and preserve your tapes has been collected in this handy kit by V-M, the Voice of Music: V-M tape splicer, recording head cleaner, "Klenz-a-Tape" chemically-treated tape cleaning cloth, adhesive labels for positive reel identification, self-timing leader tape, splicing tape and a handy instruction book.

Model K-82 . . . . . Just \$10.95.\*



### And for the Music-Loving Recordist: the V-M tape-o-matic®

This best-seller in portable stereo-play tape recorders has all the most-wanted features: Precision index counter, "Pause" button, "Monitor" switch, exclusive "Cathoptic" tuning-eye. Plays ALL stereo tapes, records and plays back in flawless high-fidelity.

V-M tape-o-matic Model 714 . . . . . Just \$225.\*

Matching StereoVoice Amplifier-speaker, Model 166. Just \$75.\*

\*Slightly higher in the West

See Your Voice of Music Dealer—TODAY!



V-M CORPORATION • BENTON HARBOR, MICHIGAN  
World Famous for the Finest in Tape Recorders, Phonographs and Record Changers

## TAPE IN EDUCATION

*Editor's Note: We regret to announce that John J. Grady, Jr., who has so capably carried on this column for many years, will no longer be able to continue because of the press of other duties.*

*We have been fortunate in finding an excellent replacement in the person of Major J. J. Kramp, USAF, Ret., who is not only a practical tape recordist (see article on page 14) and former Air Force School administrator but as President of the Institute for Research and Analysis, is now deeply engaged in finding new ways of teaching by tape.*

IN the present attempt to bring the science and practice of teaching from its current dark ages status to a place more nearly consistent with the technological state of the art available to us, many schemes are being proposed and tried. We have much interest and activity all over the country in various experiments in the use of so-called "new media" for teaching. Television teaching is being done in Hagerstown, Md., Williams-ville, N. Y., and other places. Radio is being used in several places to supplement classroom work. Motion pictures and other audio visual aids are receiving new emphasis. Text books are being rewritten to make them more appealing. Millions are being spent each year to perfect new ways of teaching our children.

The most exciting news, to date, from all of this hubbub is the work being done on teaching by tape by Sister Mary Theresa Brentano of Mt. St. Scholastica College in

Atchison, Kansas. Of all the schemes and experiments being conducted in the various "new media," this one by Sister Theresa is giving the biggest pay-off. While other "new media" teaching schemes are designed to be a crutch for poor teachers or to substitute for teachers where there is a shortage, or to attempt to stimulate interest through dramatic aids, Sister Theresa's system is designed to be a powerful tool that actually improves the learning capability of all students.

This system uses individual headsets which can be switched to any one of four tapes. The use of four tapes is unique to Sister Theresa's system and has achieved phenomenal results. One tape is designed for the average student and has essential standard core material. One tape is designed for the slow learner and is so slanted in its preparation; one tape is for the gifted student and is designed to challenge his ability. The last tape is a remedial or make-up tape. By the use of these tapes, the teacher is able to devote much more of her time to individual help. The slow learners can be helped without being embarrassed before the class and the interest of the gifted children can be maintained, all by one teacher at the same time.

The results of this revolutionary technique are truly amazing. Students taught by tape have averaged at least a half year ahead of expected achievement in every subject. Spectacular gains have been made in some subjects; classes averaged two and a half years

ahead in geography and history. In a one-month pilot test with 25 elementary students they averaged 5.7 months' gain in spelling, and a 6.8 months' gain in reading. In another test, 100 students had a fully tape-taught curriculum and over half made a gain of over two years.

This experiment has been going for five years and many of the students have had a long enough experience to show that the novelty does not wear off in time as it does with T.V. and motion pictures. Students find that school is more fun and less drudgery when their attention is absorbed by tape teaching. This system is already in full operation in 16 schools of the Benedictine Order through Kentucky, Kansas, Louisiana, Missouri and Texas and other schools are at present being converted to use this new method of teaching. The results achieved in all of these schools have been substantially the same and provide a powerful argument for further experimentation in the field of tape teaching. The results achieved in all of these schools have been substantially the same and provide a powerful argument for further experimentation in the field of tape teaching. Experiments are being planned to extend the use of tape to the teaching of mathematics and science, and plans are being made for the establishment of tape libraries of graded lesson material in many subjects that can be used by the teachers in the preparation of their daily lessons.

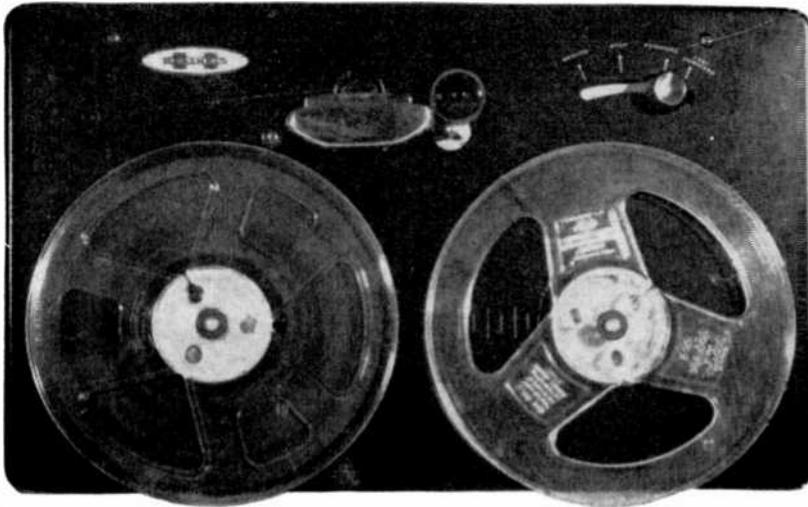
As the results of this wonderful work by Sister Theresa become more widely known, we can expect much greater use of this exciting teaching system and education will have passed a milestone comparable to Gutenberg's invention of movable type.



# Build Your Own Recorder

by Joseph J. Kramp

. . . sound difficult? It's really not with kits now available.

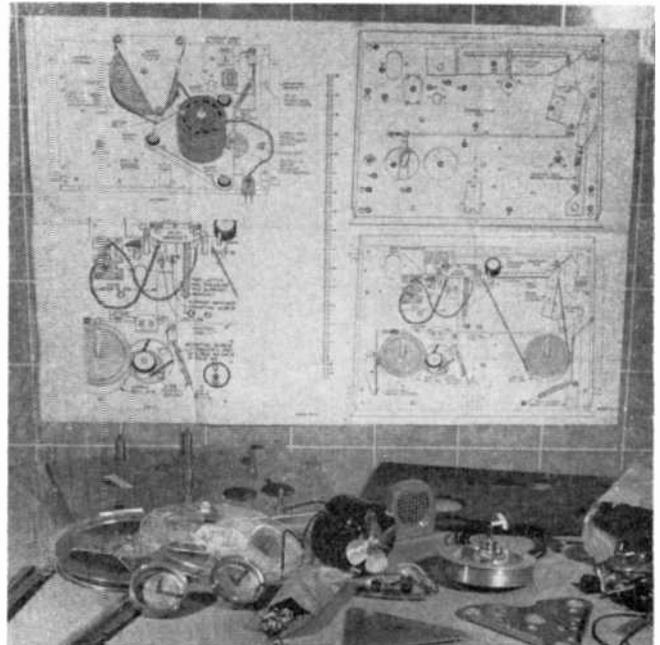


**H**AVE you yearned to build your own tape recorder? Do you want a quality tape deck and preamplifier at minimum cost? If your answer to these questions is yes, the Heathkit High Fidelity Tape Recorder Kit TR-1A has been designed for you. This kit has been designed so well that you need have no fears about your ability to construct it even if you have never picked up a soldering iron before.

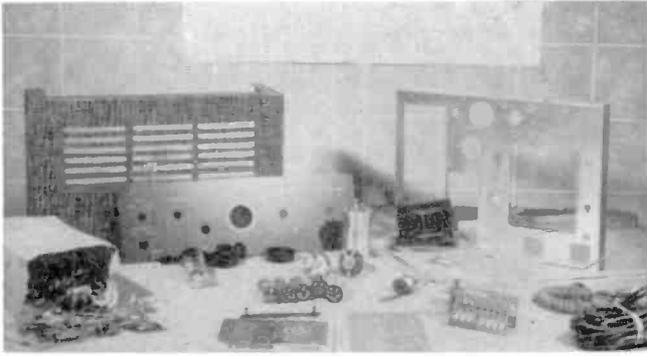
The TR-1A Tape Recorder is meant to be constructed in two completely separate phases. All of the parts for each section are packed in separate cartons to avoid confusion. It is recommended that the mechanical section be completed before unpacking the electronic section. You can construct this kit using only screwdriver, pliers and soldering iron.

We will begin by assembling the mechanical section first. The carton marked Tape Deck Kit contains all of the parts for the mechanical section and should be opened carefully to avoid losing any small parts. You should take out the assembly manual and read the unpacking instructions on page 6 of the manual before starting to unpack the parts. If you do not have too much experience in the assembly of mechanical devices of this type, we recommend that you follow the suggestion of laying out the various parts on the Parts Pictorial Sheet as they are unpacked.

The step by step assembly instructions are very good and you should have no difficulty if you follow them exactly and check off each step as it is completed. You should check during assembly to see that all moving parts are free of

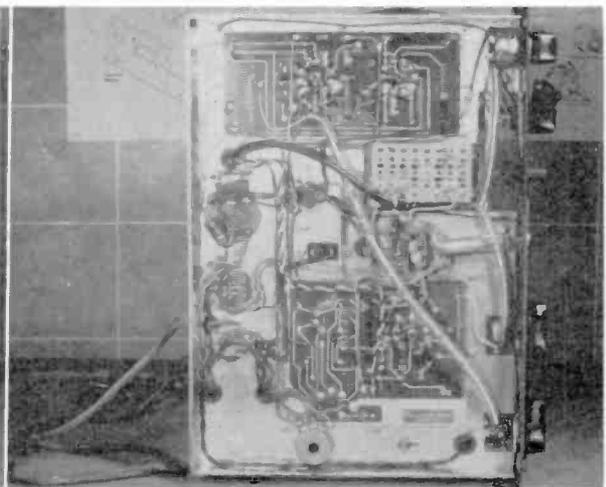
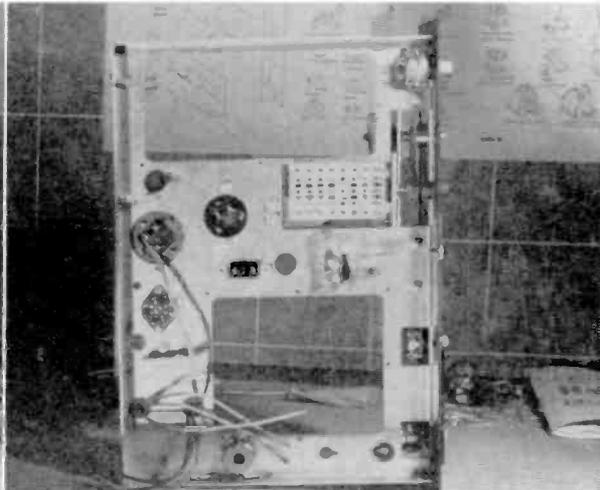
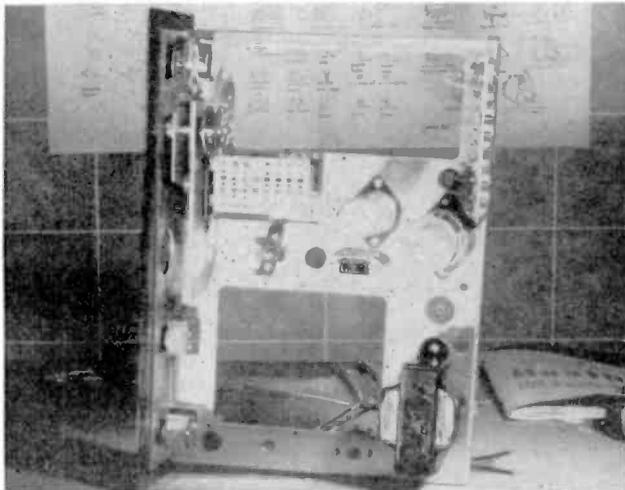
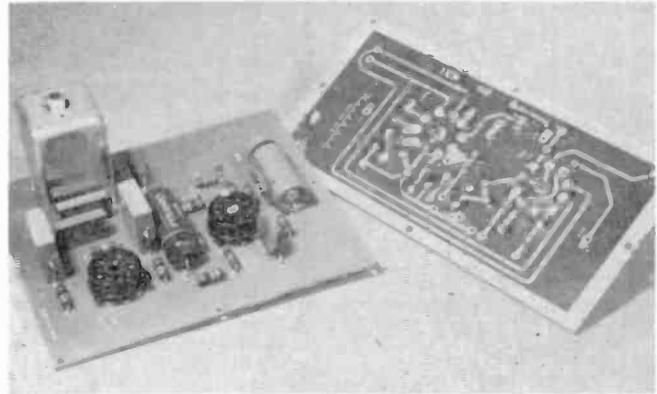


The parts of the tape deck have been identified and checked against parts list. The pictorials taped to the wall are very clear and make the job of assembly very easy even for a beginner with very little mechanical skill. Study the pictorials carefully and compare the parts before you start assembling them. You should then have no difficulty with the assembly that cannot be resolved by a quick reference to the pictorials.



Left: The parts of the electronics section after unpacking. There are quite a few small parts in this section and you should check them very carefully against the parts list. If electronics construction is new to you, you would do well to spend some time examining the markings on the various resistors and capacitors. The inside front cover of the assembly manual has a chart of all component marking codes in use. Below: The printed circuit boards are shown after all the parts have been installed and soldered. All of the parts are installed on the top of the board and the leads clipped short and soldered on the bottom. Work carefully and do a good job of soldering here but be careful not to overheat the printed board.

binding and remove any burrs that interfere with smooth operation. I found the take-up reel brake assembly was binding on the kit that I assembled, but a little judicious bending up of the free end of the arm allowed it to operate smoothly. You will probably find that the positioning of the lockwasher on the end of the supply reel shaft is somewhat aggravating but not difficult if you have patience. When installing the heads, be sure that when you solder to the double phono jack, that excess solder does not run down into the center part of the jack. Otherwise you will have



Upper left: Top view of chassis with all parts except the printed circuit boards mounted. Upper right: Bottom view of the chassis with all parts except the printed circuit boards mounted. Lower left: Top view of the completed electronics section. Lower right: Bottom view of the completed electronics section. Study the routing of the various lines in the pictorials and be sure that you place each wire exactly as shown. This is very important because the low level circuits in a preamplifier are very sensitive and can easily pick up unwanted signals which can result in hum and distortion. The lead dress shown in the pictorials has been worked out to give the least possible pickup of unwanted signals.



difficulty in inserting the phono plugs later.

The mechanical adjustment of the tape deck is really no problem with the very complete instructions and the very ingenious torque gauge furnished with the kit. You may want to touch up the adjustments after you have operated the deck for a few hours, but will find the initial adjustment is good if you have followed the directions exactly.

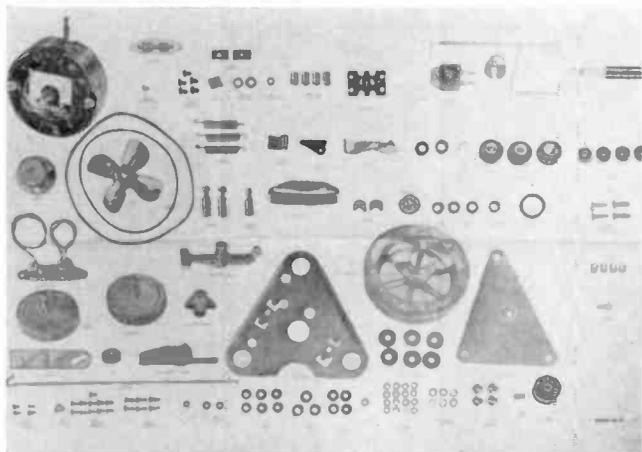
We can now put the tape deck aside and continue with the electronics section.

Open the carton marked Tape Recorder Electronics and read the unpacking instructions on page 11 of the assembly manual. You should have no trouble in identifying the various parts with the excellent Parts Pictorial Sheet. The suggestions on separating the small parts are excellent for those of you who are not too familiar with electronic parts. There are quite a few little parts and you will save time and temper by a systematic arrangement. If there is a correction sheet, write the corrections into the manual now.

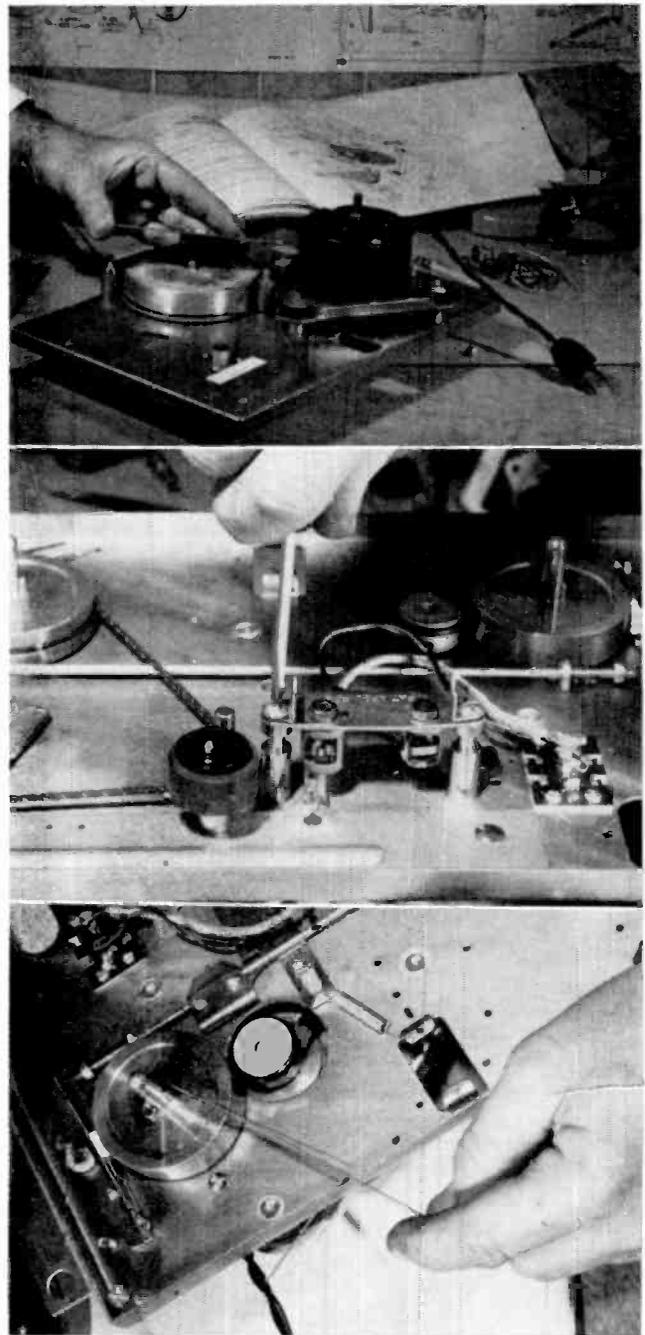
No solder is provided with this kit, so you will have to get your own. You *must* use radio grade rosin core solder. You *can* use regular 50/50 rosin core solder but I much prefer the special 60 tin/40 lead small diameter solder that is put up specifically for printed circuit wiring. This solder melts at a lower temperature, makes better joints and is easier to use than the regular solder. I use ERSIN multicore high tin solder which you can get at any electronics supplier or one of the mail order houses at 50¢ for a generous package. The soldering instructions in the assembly manual are very good and even the beginner should have no trouble in doing a good job.

Assembly of the components is simple. The pictorials are very clear and the top of the board is printed with the outlines of the parts to be mounted. The only difficulty that I found was that the 3K ohm 1% resistor was too large for space provided and the leads had to be bent back to fit the holes. This discrepancy has probably been corrected in later kits. Try to solder the leads with the minimum solder for a good joint and try to avoid getting too much rosin flux on the board itself.

Assembly of the large parts on the chassis is easy. Use care in positioning the various switches to avoid any confusion later on. It is convenient to mark with pencil on the



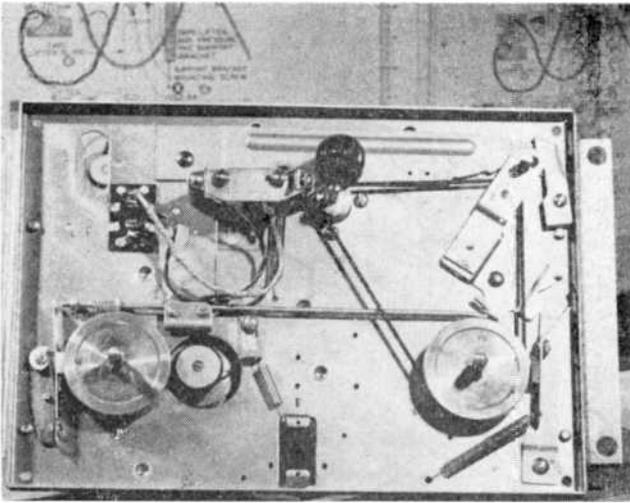
The parts pictorial for the tape deck is very clear and complete. All parts are clearly identified and you should have no difficulty in instantly recognizing each part. Check the parts that you have unpacked against this pictorial to be sure that you have received all of the screws, nuts, washers that are shown.



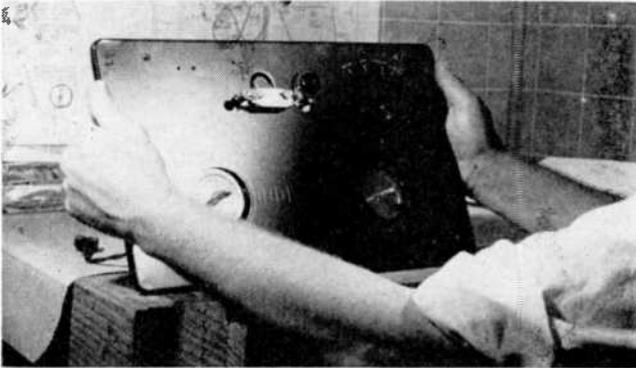
Top: Installing the outer bearing plate for the capstan assembly. All of the parts fit together easily and there is no possibility of installing a part the wrong way. Center: Installing the head bracket and heads. These heads are prealigned and the screws holding them should not be touched. Do not try to tighten or otherwise adjust the nuts holding the heads or you will spoil the alignment. Bottom: Adjustment of the tension on the supply reel hub is easy with the torque gauge furnished. Follow the directions for the use of the torque gauge carefully—it is a precision instrument and will give you an excellent adjustment if these directions are followed.

switches the numbers of the various terminals before assembling them on the chassis; it will make things easier later on. The lugs on the large aluminum can electrolytic capacitors are identified by little triangular, square or semi circular cutouts where the lug emerges from the bottom of the capacitor. They are adequately identified in the step by step instructions and on the pictorial diagrams.

When you start the wiring, please read the instructions carefully. You will note that each step will tell you to either leave the connection unsoldered for the time being (NS)



The top side of the tape deck after completion of construction and adjustment. Check carefully to see that there is no binding of moving parts and that everything works smoothly. All that remains to be done now with the tape deck is to install it and connect it to the electronics section. You will find some holes in the chassis not used but that is O.K.



The front panel mounting has been adjusted so that all of the moving parts are free to move without binding and the mounting studs tightened to hold the adjustment. The panel must be removed from the chassis before the deck can be mounted.

or to solder and how many wires are to be soldered, i.e. (S1) means solder 1 wire, (S3) means solder 3 wires. There is one place in the wiring which can try your patience. The terminal strip DD has several small parts installed and one of the lugs has 8 wires connecting to it, one of which is the lead of the crystal diode. It would be well to put a bit of wet kleenex around the lead of the crystal diode before soldering to avoid damaging this unit. Try to keep all leads dressed exactly as shown in the various pictorials.

After you have finished the wiring and checked it over to be sure that everything is properly mounted and soldered in place, you are ready for the preliminary test of the equipment. You will require some high level signal source such as an audio generator, radio tuner, audio output from your TV (if it is fed to a separate amplifier), or you can use the external amplifier jack on another recorder. If you don't have any of these and can't borrow one of them, you had better ask your radio/TV man to make the preliminary test. If you have followed the instructions accurately, you should have no troubles at all. You may not be able to completely balance out *all* of the hum at high gain settings with no input signal, but this will not be objectionable when a signal is present.

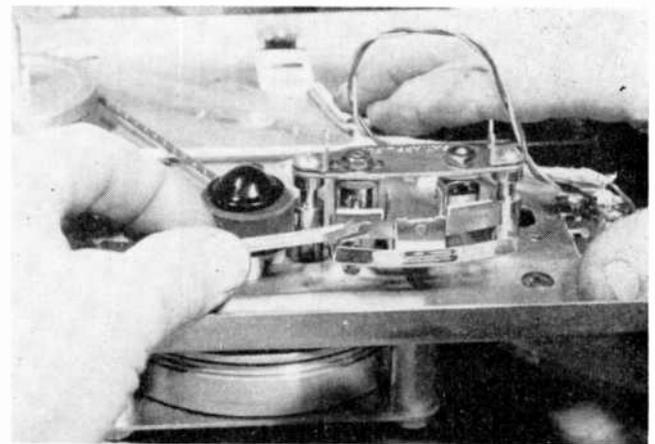
After the preliminary test has been completed, you can proceed with the final assembly and checking. The assembly manuals give one method of mounting but you may want to mount the components some other way or in a console. There are many possible ways of mounting these units. The tape deck may be installed in any position, so long as it is adequately fastened in place. The electronics unit can be installed in the attractive cabinet furnished or it can be installed in a console in any position provided that it is properly supported and not allowed to hang by the front panel alone. The electronics unit should be close to the tape deck to avoid the problems of loss and hum pickup in the lines between the two.

After you have mounted the tape deck in its proper position you can finish installing the remaining parts—fan, front panel, tape feed compensator & cover, tape lifter & pressure pad support bracket and head cover. Install the electronics unit in its proper position and interconnect the two units according to the instructions in the electronics section manual.

Your tape recorder is now ready to operate. The operation instructions are very clear and you will have no trouble in operating this recorder even if you have never operated one before. The manuals cover all possible difficulties very well and in the event you do have trouble you should be able to locate it quickly and correct it. In the unlikely event that you have a difficulty that you cannot locate and remedy, you can ship the defective unit to the Heath Company for repair or adjustment in accordance with the three months warranty. The procedures for obtaining service and technical assistance are well outlined in the manuals.

I was very agreeably surprised by the performance of this tape recorder and I am sure that you will be too. The fidelity of the units is excellent and they will give an excellent account of themselves in a high quality recording-play back system. Your few evenings spent in the construction of this recorder will reward you, not only with a high quality, low cost piece of equipment, but also with a great feeling of pride in your accomplishment.

Although the Heath Company has not announced any such plan, I presume that a stereo conversion kit may, at some later date, become available for the stereo playback of recorded tapes.



It may be necessary to adjust the pressure pads on the tape lifter. This is done by tipping back the cover and very carefully bending the springs so that the pads make light contact with the heads when the shift lever is in 'forward' position. You should also be sure that the tape lifter assembly does not bind on the heads.

# Video Tape Used in Football Pep Talk

. . . . plays reviewed in  
dressing room between  
halves.



Ike Armstrong, athletic director of the University of Minnesota, studied plays at a live monitor on the Minnesota 50-yard line.

**A** UNIQUE "secret weapon" in the form of videotape recording—one of the real off-beat VTR uses—moved into college football for the first time November 8 when the Minnesota Gophers took the field against Iowa's Hawkeyes.

With the consent of Iowa officials, WCCO-TV of Minneapolis-St. Paul recorded the action of the Big Ten game on "Scotch" brand magnetic video recording tape and fed it through a closed circuit to television monitors in the Gopher locker rooms during half-time.

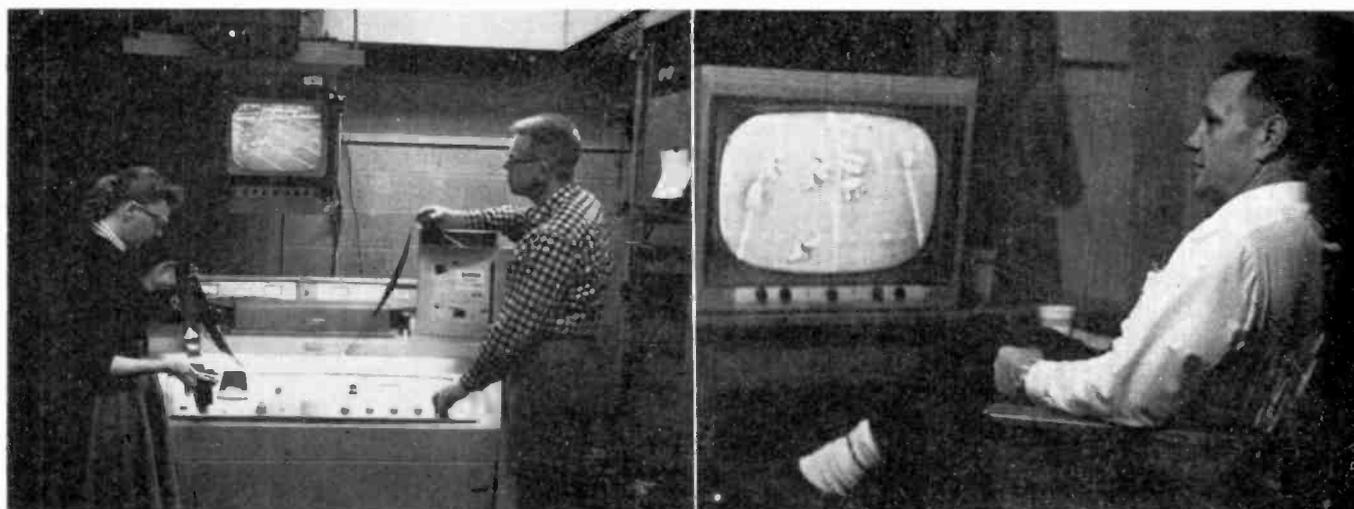
Coach Murray Warmath and his staff could call back and study particular plays in time to adjust their second-half strategy to strengths or weaknesses displayed by both teams. Minnesota's assistant coach Dick Larson manned a

live monitor on the Gopher 50-yard line during the game.

Although the Gophers lost the game, Warmath says the sideline monitor and the taped plays shown at half-time were valuable to his team, all of whom later viewed the entire game in their dressing room.

While the professional Los Angeles Rams team has used a similar arrangement for its home games since September, the Minnesota-Iowa game was the first time magnetic video recording tape went to work for college football.

Use of VTR cannot win or lose games, but it is significant that the Gophers, who were losing 21-0 at the end of the first half of the game, held the Hawkeyes to a final score of 28-6 and went on to beat Michigan State 39-12 the following week.



Left: Technicians monitored the Minnesota-Iowa game in WCCO-TV's VTR room. The game was recorded for immediate playback on two-inch wide "Scotch" brand magnetic video recording tape which requires no processing. Right: Minnesota coach Murray Warmath reviewed first-half plays with his staff in the Gopher locker rooms. The tape was played again for his team after the game.

# Home Recorded Pictures on Tape—When?

by H. J. Hasbrouck

. . . . it may not be as late as you think.

**N**OW that the professional recording of pictures on magnetic tape is firmly entrenched in the television industry as a multi-million dollar investment with side effects reaching to film producers and advertising agencies, it might be a good time for the amateur tape enthusiast to ask a \$64,000 question. When is it going to be possible for him to latch onto a recorder that can see as well as hear? Is his hobby, which at first had only one ear and now has two, going to sprout a couple of eyes in the near future? Blind up to now will it soon take a giant step forward with sight?

For an answer one would have to look behind the scenes in some of this country's most advanced electronic laboratories. The wait may not be too long. Since a trail has been blazed by the professional video recorders most of the engineering problems have been solved and there only remains the obstacle of cost. Simplification of picture equipment for home use is not easy. But it must be remembered that many of the things we own today such as cars, refrigerators, air conditioning and even television itself, were once considered to be only for the rich. Home video recording may follow the same course. If manufacturers are able to overcome the equipment cost there is the second enigma, how to make the tape cheap enough for the amateur to buy. Both of these problems are getting a lot of thought.

Professional video recorders have been made nearly perfect in the United States and in Europe. Their performance, most of the time, leaves little to be desired. Picture quality is usually equal to that of a live show

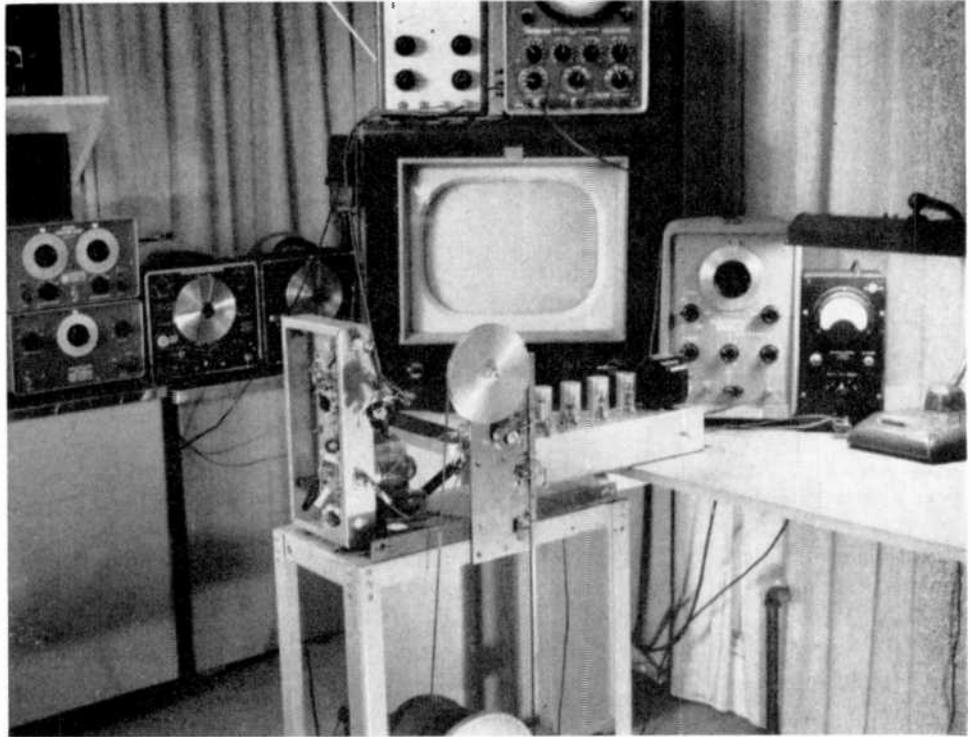
as seen on the studio monitor and in most cases is superior to that viewed at home. If the hobbyist were willing to accept a somewhat compromised picture quality and pay a little too much for it he could probably have a TV recorder now. But it would not make personalized home movies. Television cameras and synchronization generators would boost the overall cost to a prohibitive amount. From a dollar and cents angle there is some hope for the recorder alone, however.

## A Look at Professional Equipment

For the well-to-do amateur who can't wait there is professional videotape equipment that might be pried loose for him if he could establish a priority. At a price equal to that of a very nice ranch style home an individual could order, and maybe obtain, a broadcast television picture recorder capable of absorbing an hour long show. This would have to be diverted from some shipment to a television network that wanted it for delayed transmissions to different time zone localities. At the price of \$45,000 it would have to be a monochrome job. That's

Below: Television picture with frequency response limited to 200,000 cycles per second. Recognition as a human figure is just beginning. Right, top and bottom: taped pictures from a simplified system with frequency range between 4,000 cps and 2 mc. Minor flaws do not detract from entertainment value.





High speed tape loop and equipment used by author to study recorded picture quality and develop radio frequency heads.

black and white. If he wanted color he would have to also throw in the price of an extremely nice cabin cruiser, forty feet long with two engines—\$30,000.

It is a fair assumption that there are few persons so intrigued with television that they would choose a video recorder over the other necessities mentioned. Broadcast networks however have more than a passing interest in videotape. For them the machines fill a real need as important as money in the bank, making it possible for them to delay certain shows originating in the East, until a more suitable time for West Coast presentation.

#### Television Videotape Activities

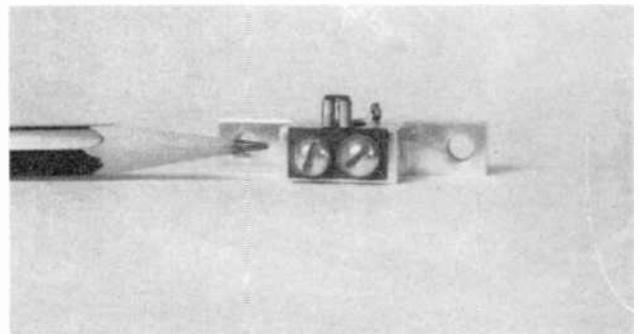
Ampex, a big name in all tape devices, pioneered the first practical videotape recorder although several others had tried. Pre-production units were delivered to the major television networks in late 1956 and early 1957. Video recorders have been in heavy use since, for delay programming, greatly aiding the Summer Daylight Saving Time telecasting. Networks are able to have this convenience yet retain the full quality of the original live show. First to use the Ampex videotape recorders was the Columbia Broadcasting System.

That TV networks take videotape seriously is indicated by the weight of their investments. In April the National Broadcasting Company opened its \$1.5 million West Coast control center for TV tape operations. Robert W. Sarnoff, president of NBC, stated that NBC was just starting to explore the possibilities of tape. Picture tape centers have been set up by both networks on both coasts but at present most of the taping in California is of East Coast programs for later use, or for sending back East an hour later to States not observing Daylight Saving time. By now the number of TV tape recorders in use throughout the country is said to be well over the 100 mark.

Another important contributor to taped TV is the Radio Corporation of America which is also offering video recorders in color and monochrome. Not the first to get practical recorders on the market RCA was engaged in

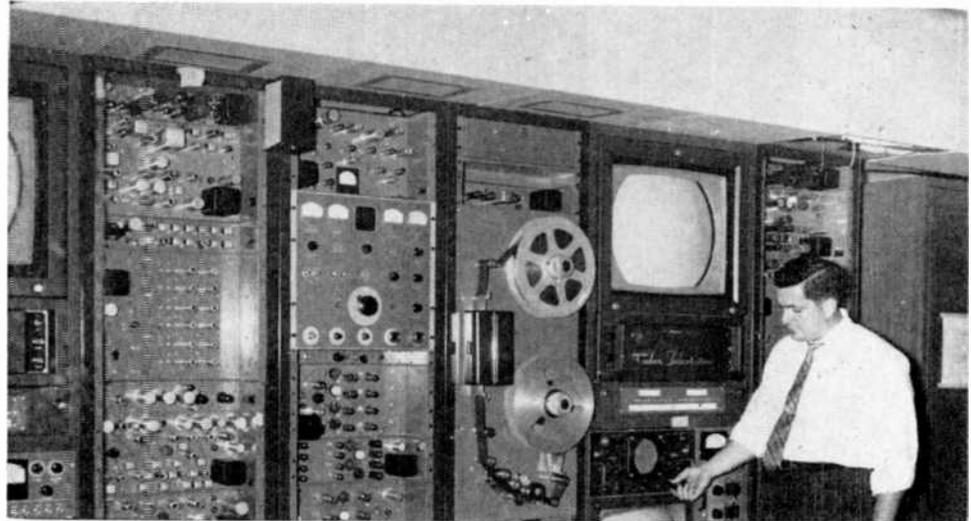
early development and experimentation. As a big brother to NBC the Radio Corporation has long been feeling the pulse of television and videotape requirements. RCA even went as far as to demonstrate a home type recorder although it was not manufactured. Both RCA and Ampex are heavily interested in industrial electronics for which instrumentation and videotape recorders play an important role.

While the American video tape recorders are somewhat similar, the British Broadcasting Company recently surprised the electronic world by producing a practical TV recorder based on different operating principles. It is termed a more economical machine and puts a fifteen minute program on half inch tape using 20½ inch diameter reels. Video tape used in this country is two inches in width. The British instrument features reduced tape speed having finer gapped heads to make up the wavelength deficiency. Since there is no color TV in Britain some simplification was possible. While the price tag of the English machine is about half that of ours the fact it can only record fifteen minutes without changing over means that two recorders are necessary for a prolonged show. This makes the economy questionable except when short programs or commercials permit the



One form of video head used Ferrite pole pieces containing no iron. Has resonance above 5 megacycles.

Part of the RCA video color and black and white recording installation at NBC in New York. Programs delayed for different time zones is an important use.



use of a single unit. American machines will record continuously for about 64 minutes.

### Other Applications for Video Recorders

Besides the TV angle there are many tasks to which the video recorder may well be put. New uses are being discovered daily. For example there has been the adoption of TV recorders by advertising agencies for preparation of commercial material. This is expected to open up a new market area for recorders and camera chains. Camera chains are usually vidicon, carrying three or four pick-up cameras. Not many commercials are in color and this may be the case for some time. The chief advantage to producers is the immediate playback allowing review right after shooting. The technical advantage of taped commercials is that the production can be made with the correct electronic signal characteristic. Film that appears suitable to the producer may be below standard when

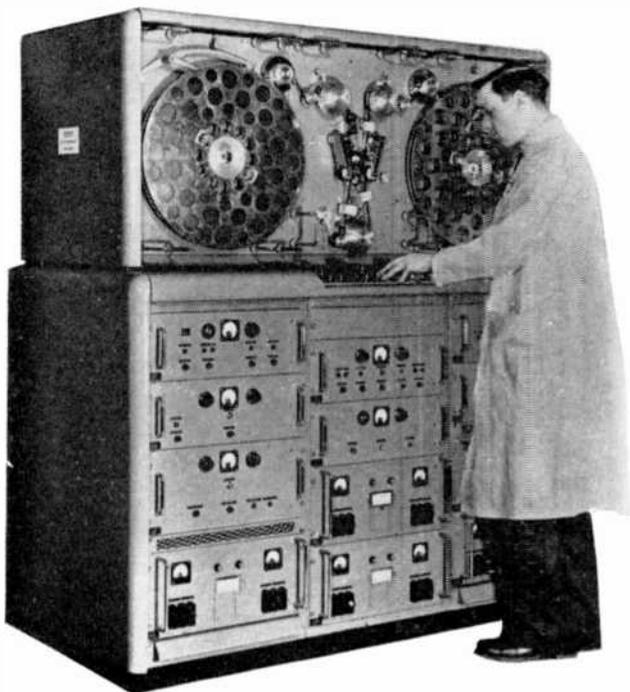
used with studio equipment not set for its particular light values and other factors that have to be converted into a video signal.

Looking a little beyond the recording of televised shows by amateurs as a hobby, the photographic industry has been eyeing the possible advent of the home video system with some concern lest it should eventually replace film. The photogs asked the tape men what they saw ahead in this regard. One prominent tape executive replied he could see at least all TV film companies turning to tape. There is less expectancy about tape replacing film in the home amusement field. Right now it would seem that taped pictures belong more to television and education. To extend it to other fields requires cameras and other additional apparatus which could hardly be called portable. True a few rich amateurs may play around with the idea. This we always have. But in the overall picture they would be hard to find. Tape will probably not take over the home movie system for a long time to come. But the video recorder as an accessory to the television receiver may be nearer than most people think.

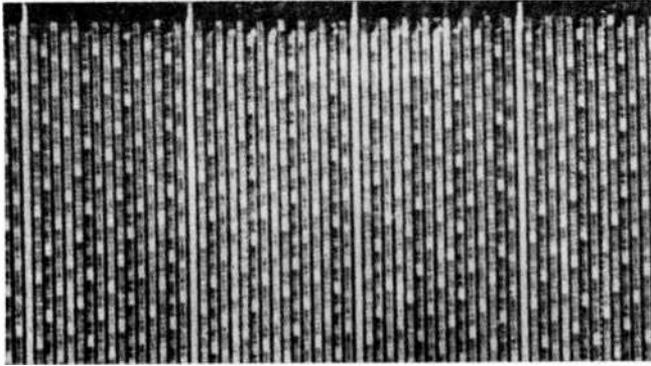
Video recorders are doing jobs previously thought impossible. Camera chain and recorder equipment are predicted for medical schools. Recently visitors to the American Medical Association convention studied taped recordings of an actual operation.

Racetracks are seeing the possibilities in video recording. Some tracks record races from the standpoint of checking fouls and then erase the tape if there is no incident. Races run earlier are often televised for public viewing, taking only a few minutes of air time but representing possibly hours of track and waiting time.

Then there is the so called calamity recording. This practical application involves the recording of everyday happenings which are uneventful 99% of the time. It makes use of the video recorder's ability to record continuously without using up the recording medium. The foul in the horse race; a bank is held up; a train is wrecked or a plane crashes on take-off or landing. To record all of the unnecessary information day after day on motion picture film, while waiting for the unexpected, would be out of the question because of the cost of processing which might be \$100 an hour. Cost conscious executives wouldn't give it a second thought. But running a video-tape recorder costs but a fraction of this, considering the number of times a tape can be erased and reused.



British V.E.R.A. video recorder designed by the BBC uses half inch wide tape at 200 inches per second speed. Handles 15 minutes of program on 20½ inch reels. Does not rotate heads.



This is what a picture looks like on tape. Magnetization made visible with iron powder. Travel is left to right.

The government is taking a long look at video recording in connection with its educational and training programs. Here again the availability of access to the recorded material, without the delay of photographic processing, is appealing.

In all probability the cameras and video recorders for numerous industrial applications including data recording, could be of a design providing somewhat less in picture quality than the near perfect instruments intended for television transmissions. The same thinking that has been applied to radiotelephone communication apparatus, which possesses a sound quality you would not tolerate in your living room, but which is adequate to get the message through, could be considered. There are many cases where extreme picture quality would not be necessary. The home market, news gathering facilities, rapid transmission of still pictures, telegrams, drawings, etc., at the rate of thirty per second, are all targets that should interest prospective manufacturers of a less-than-perfect video recorder. There are certainly uses for video recorders in navigation, aviation, study of manufacturing processes, and in other fields, that challenge the imagination, all of which could be met by less expensive video recorders than those now available. But this is hardly the place to compile such a list.

#### Why Are Video Recorders So Expensive?

To explain this it is necessary to delve into the theory of operation of a video recorder. Those who understand what makes television work will have an easier time of it. The two go together like ham and eggs. There is no simple way to explain either. The complications are tremendous. It has been said that when patent application was filed in one country for a video recorder the patent was refused because the examiner could not be made to understand the device and insisted that it could not operate. Later a native proved that the recorder would work.

There is little use comparing a videotape recorder to your own audio tape machine. Everything is different. Because of the huge amount of information in the form of long and short pulses, that make up a single picture, the tape has to have more surface area. It has to be wider and run much faster than that in your home instrument. Video tape is usually two inches wide with the sound track running lengthwise and the picture tracks almost at right angles across it. Since the latter are interrupted they must be perfectly joined and synchronized for reproduction. Speed control data is recorded longitudinally. By these means an effective head-to-tape velocity of 1,500 inches per second is obtained for the picture while the actual tape

travel from the supply reel to the take-up reel is only 15 inches per second. The high surface speed results from rotating the heads on a drum about two inches in diameter running at about 14,000 revolutions per minute. There are four heads on this drum and each must be properly switched while playing back. This is done electronically. The process of applying the picture tracks bears some resemblance to cutting a screw thread on a lathe, if you think about the tape being only a part of the screw surface.

There is of course no picture recognizable as such on the video tape. It is not like motion picture film in that respect, where each frame is a complete scene and can be looked at with a magnifying glass. "Pictures" on magnetic tape can also be examined by treating the tape surface with iron powder which makes the areas of varying magnetization visible, but you would probably find little amusement in looking at them unless you were an engineer.

The television station not only sends out bits of information that later form a picture but included in the video signal, as it is called, are thousands of pulses per second, called synchronizing pulses, that are extracted by sensing circuits in your television receiver so that they are never seen on the picture tube. These signals tell the flying spot in your picture tube where to go and when; how bright to be and when to go out entirely. All of the data transmitted, which goes to make up your television picture, is controlled by the timing and intensity, or voltage, of the video signal after it has been taken away from the station carrier frequency

#### Home Video Recorder Design Problems

Part of the difficulty in designing a home type video recorder lies in reducing its size and weight. Professional videotape recorders weigh as much as 2,000 pounds. Power consumption is also something to consider. The video recorded picture you may be watching tonight will probably be using electric power at the rate of 4,000 watts at the station, enough to run several air conditioning units in your home. If such undesirable features could be eliminated from professional machines, without loss of picture quality, designers would of course do it. But it is not easy. On the other hand today's problems have a way of becoming simpler tomorrow.

While the operation of a professional video recorder is not extremely difficult the setting up and maintenance require trained personnel. There is, for example, a built-in oscilloscope for the examination of various waveforms and synchronizing signals. Periodic attention must be paid to such matters as bias. Heads must be replaced as they wear out. How to simplify and improve the ease of handling poses quite a problem for the designer of home video electronics.

There is no way to determine how many manufacturers of recording equipment are attempting to work out an adjusted system that you and I will be able to buy for taking television pictures on tape. There is a natural secrecy where competition is a way of life. No doubt many are interested. Some are known to be building and testing experimental models.

#### What Compromises are Possible?

To evaluate the possibilities of a home video recorder the author set out to determine how many of the expensive controlling factors affecting picture quality could be elimi-



Ampex VR-1000 video tape recorder shows extent to which engineering, and even styling, have been carried. Cabinet on right is color attachment.

nated or modified without losing too much of the entertainment value of the picture. Tests were made with filters to see when blurring began as high frequency response was limited and what happened to the picture background when low frequency range was reduced. Considerable data was taken and many observations were made. It was surprising how much of the frequency range could be eliminated before the quality became unacceptable.

Transmission of the normal picture requires a frequency range extending from almost dc, or possibly from 20 cycles per second, upwards to about 3.5 or 4 million cycles per second. The total spread or band pass, as it is usually called, is best expressed in octaves. One octave doubles the frequency, or halves it, depending on whether we are going upward or downward from some reference point. Therefore the high quality picture transmission requires passage through the recording system of approximately eighteen octaves. By way of comparison a good hi fi audio recording system would have to handle only about eight octaves, and when doing that quite some compensation has to be made to obtain overall response flatness. Compensation always uses up signal-to-noise ratio and for the video recorder full compensation cannot be made over eighteen octaves without exhausting the signal-to-noise ratio of the tape. This has to do with the fact that during reproduction from tape the output voltage from the head falls off to half when the frequency is reduced to half. In other words the drop off of signal amounts to 6 db per octave, going down, and it has to be made up by equalizing. A little arithmetic shows it can't be done since some 108 db of equalizing would be necessary which is more than twice the signal-to-noise ratio of the tape. Therefore it is necessary to resort to frequency modulation. This is done in professional American made recorders for video.

However the British have found that it is not necessary to employ this method for recording the higher frequency components of the picture. They have divided the video spectrum into two parts and all frequencies from 100,000 to the highest, or about 3 megacycles, are taken by normal recording procedure.

It was found by the author that this game could be played a little further when professional picture quality is not the objective. Of course to preserve the synchronization pulses, which occur at the line frequency of 15,750

cycles per second in a television transmission, it is of course necessary to include them in the overall response of a compromised system. Then the picture will lock in properly at the receiver. And it is necessary to go down a little farther to make the picture background acceptable, providing something better than just the outlines of object and human figures.

The lowest frequency that it seemed possible to record and reproduce without resorting to either amplitude or frequency modulation of a carrier, was found to be in the neighborhood of 4,000 cycles per second. Even though an experimental channel having a band coverage of from 4,000 cps to 2 megacycles, occasionally introduces ridiculous flaws in a picture, such as a long molding or shelf in the background that passes across an actor's face producing the familiar "X-ray effect," or smearing of lettering in commercials, the conclusion was arrived at, after the observation of numerous half-hour and hour-long programs, that in spite of the imperfections the taped programs had high entertainment value. In the illustrations that accompany this article may be seen photographs of taped pictures employing this limited frequency range. It is perfectly possible to recognize faces and read letters three-eighths of an inch high in commercials.

In a simplified recorder a second track is indicated for the sound. It is an interesting fact that high frequencies cannot be easily recorded on slowly moving tape nor can low frequencies be placed directly on high speed tape. For the audio range, therefore, modulation of a carrier has to be employed. Another approach that is being tried, to avoid a second track, is to sacrifice a small slice of the very wide video pass band, and modulate it for the sound, later filtering it from the picture.

Pictures recorded using the simplified arrangement described have been judged almost good enough for home use, by some observers. The tape employed was of home-sound quality.

#### Professional Video Tape is Costly

Video tape sufficiently perfect to pass the rigid inspection it receives, costs about \$300 for enough to record an hour show. The fact that it can be used hundreds of times, however, makes the effective cost only about one tenth that of motion picture film with processing included. Television networks would like to see the price reduced but in the meantime are willing to use it in great quantities. Tape of domestic quality, such as might be used in the home recording of television pictures, if slit to the same two inch width, would cost the amateur only about \$32. This would be enough for a half-hour recording. He might at first be staggered by the figure but he should remember that his home movie film costs about as much and it can't be erased to be used over and over again.

It is possible that tape manufacturers would be able to do something about getting the home picture recording program off to a start if they were convinced as to an adequate market. Tape costs might then be further reduced. A half hour show has plenty of entertainment and the thought that the tape is not really being used up should help a lot. Later if there were manufacturing economies justifying a price reduction, the amateur could afford to preserve some of his better picture recordings.

The argument that a television picture recorder in the home lacks the personalized feature of home movie making

*(Continued on page 32)*

# DON'T JUST MAKE RECORDINGS—PLAN THEM

by Richard T. Berg

. . . . a library of well organized recordings will become and remain a family keepsake.

ONE of the easiest things to do while recording music from the radio is to produce a jumbled, ill-assorted program of items that have no relation to each other. Another easy thing is to run out of tape in the middle of a selection. Both of them happen so naturally. The reel is on the machine, ready to go. The tape is partly used, but it's setting at the right spot—just pass the end of the previous recording. Something good is announced on the radio. It's a piece of music we'd hate to miss, so we rush over, turn on the machine, and start recording—just as the music starts, if we're lucky, but that's almost too much to hope for.

If a person's musical tastes are varied, he can produce some rather weird combinations this way. Just as one example, he is very likely to have dance band numbers mixed in with performances of more serious music. Even if he keeps these two general types separate, there are wide variations within each group. He may wind up with several loud, blaring numbers in the middle of his nice, soothing background music, or he may have Strauss next to Bach. There will be times, too, when one of the longer compositions will trail right off the end of the tape.

These are not just wild possibilities. I have personally made every one of these mistakes, and worse. However, they were the mistakes of a beginner, carried away with the first excitement of making his own recordings. It doesn't *have* to work out this way. It *is* possible to assemble a variety of programs to suit your different moods and to make each tape a unified program in itself. All it requires is a little care, a little patience and a little planning.

First of all, you should decide on the general lines of organization. What are the different kinds of music, or other program material, that have the greatest interest for you? For most people there will be at least several distinct categories. If you are actively collecting all of them, the only way you can avoid jumbling them up on the same tape is to have a stand-by reel for each one of them. Keep these reels in a separate location and well labeled so you won't have to fumble around for them when you need them.

This will permit you to edit your tape as you go, recording only the material you really want and putting it on the appropriate reel. It may be a new reel, or it may be partly used. The important thing is to make sure you have enough recording time available to satisfy your immediate needs in each category. Then be sure to have an adequate reserve supply to take care of the surprises.

Now, with tape available for each of your major program interests, the next thing is to know *how much* tape is available, especially in the partly-used reels. How far have you recorded, and how much is left? Of course you can easily find a certain location on the tape by using the counter or visual index on your machine, but do you have any idea of how many *minutes* there are on either side of that location? If you have a counter, the chances are that you are reading neither minutes nor feet, but something related to revolutions. This isn't very much help, because a revolution on one end of the tape is something quite different from a revolution on the other end. The only suitable answer to this problem is to make a conversation chart showing minutes vs. counter readings.

Sometime when you are playing a standard tape all the way through, post yourself next to the machine with a pencil and paper and a watch, and write down the counter reading every minute. With the resulting tabulation, you will be able to tell just how many minutes have elapsed since the start of the tape, and a simple subtraction will give you the number of minutes remaining on the reel.

At this point, a word of caution is in order. The conversion chart you have made will be accurate for only one tape length and only one hub size. It would take a slide rule and a fancy formula to convert from regular tape to long-playing tape, for example; so you might as well make a chart for each of the circumstances that you normally meet with. This little chore is kind of a nuisance, but you can be listening to good music while you work, and the results are well worth the time spent on it. Once you know your tape position in minutes, you can do an intelligent job of planning and of placing your favorite music on the tape where it belongs.

The kind of planning you do will depend, to a certain extent, on the sort of music you are primarily interested in and the kind of advance information you can get on radio programs. Serious orchestral compositions are ordinarily listed in the newspapers, so you can decide in advance whether or not there is something you want to record. On the other hand, the light, popular music is usually indicated with only the general title of the program, so you don't have as much to go by.

If your interests lean toward the lighter music, you will probably group your recordings into categories based on different rhythms, or different moods or different recording artists. Unless you know of certain programs that spot-

light your favorites, you will have to take your chances with the disk jockies. This is pretty much a matter of "wait and see." You'll have to listen to all the selections and hover over your machine, ready to start recording as soon as a good one is announced—a good one that fits the theme of the tape you have on your recorder, of course. That's the part that requires patience. There isn't enough time to change reels, and there is a terrific temptation to record *any* good one that comes along. However, you'll have to remind yourself to concentrate on only one category at a time. Later, when you are playing back the tape, you'll be glad you did.

For the serious compositions, the most natural grouping is probably by instruments. Thus you might keep the piano selections on one reel, the violin on another, the pieces for full orchestra on still another, and so on. You might also sub-divide by composers. A musical expert could probably suggest countless other ways to break it down, but these seem to be the easiest to use.

Since the newspaper gives us advance notice of the music to be performed, we should have no trouble deciding on the proper category for it. The main problem here is one of timing. The selections are usually rather long, so it is almost impossible to build up a program that will stop just before the end of the tape. All too often they run *past* the end, and we have wasted not only our time, but also a good opportunity to record a fine piece of music.

It's always the last 15 or 20 minutes that are so hard to deal with, and, since most of the major works run longer than this, the odds are against us. (The average concerto lasts about 30 minutes, and symphonies usually take five or ten minutes more.) After a few attempts, a person is apt to give up in disgust and just resign himself to a certain amount of blank tape. However, 15 minutes out of a one-hour tape means a loss of 25 per cent, so it's a problem worth working on. Here are a few ideas that should prove helpful.

There happens to be a small book which appears, at first glance, to solve the whole problem. The title is *THE STANDARD MUSICAL REPERTOIRE With Accurate Timings* by William Reddick; Doubleday & Co. It lists the composers and their works alphabetically and shows the playing time for each one—by movements for the longer works. The listing also gives the name of the musician whose performance was timed, since each conductor or artist interprets a piece of music differently. For the same reason, the stated playing times are intended to be only representative, and it would be wise to add a safety factor when using these figures. The tabulation is not as complete as we might wish for, but it does contain a good deal of information that we wouldn't have otherwise. The really sad thing about this book is that it was published in 1947 and is no longer in print. However, if it is available at your public library, it can be a very valuable tool.

If you can't find a copy of this book, don't despair; there are still a couple of ways to attack the problem. One of them is to snip off the short end that you can't use and put it where it will do some good. Here's how that works. Suppose you have recorded to within 15 minutes of the end of side #1 and you don't have any ideas on how to use up the remaining time. If you snip off the 15 minutes and splice it on the *other* end of the same tape, you will have a full length for side #2, and you will be

able to start it at a point just opposite the end of side #1.

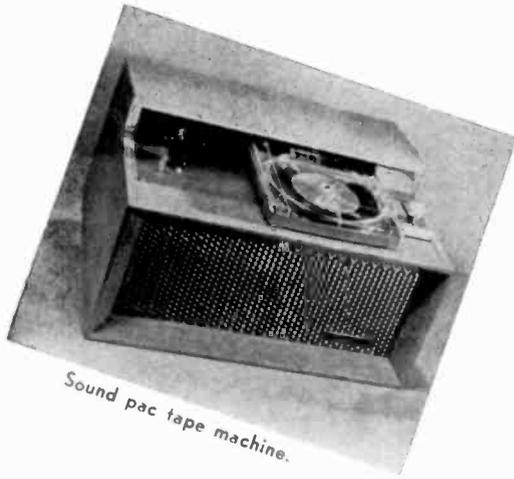
So far, you haven't gained a thing, but, if you happen to have the same experience with the second side, you can detach the unused portion permanently and put it on a spare reel. Even if your luck improves on side #2, there will almost always be some tape that you can cut off and put in the "kitty." You can either accumulate these savings until you have a whole reel of "free" tape, or you can splice them onto other tapes where they will do the most good. A seven-inch reel of LP tape will easily hold up to 200 extra feet—about 5 minutes at 7½ ips. or 10 minutes at 3¾ ips. In certain cases this added length might greatly improve the possibility of recording another number and coming out even. Obviously, this method will give you a variety of long and short tapes, but the music will sound just as good as it would on standard lengths, and you will be getting better use out of your tape.

There is only one method that gets the absolute maximum out of your tape. That is the Flying Splice Method (described in a previous issue), which carries a performance from one reel to the next without an intermission. Briefly, the idea is to splice a fresh reel of tape to the end of the exhausted one without interrupting the recording. During the last two minutes of tape, you unreel the remainder from the supply spool onto the floor; replace the empty spool with a new one; make a quick splice; and continue recording right off the end of one tape and onto the start of the next one. When the selection you are recording comes to an end, you go back to the splice, separate the two tapes, and put a leader on each one.

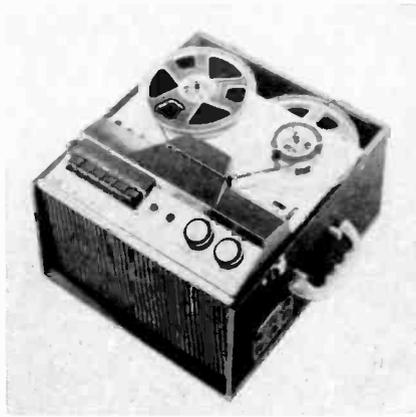
You can keep right on going this way, through the first sides of two reels, then through the second sides, and then into another pair of reels. The main disadvantage is that some of the major works will start on one reel and finish on another. Every note of the music will be on your takes, but it will be a nuisance to have to change reels during the playback, especially if the break comes at a crucial moment in the composition. Editing will correct this to a certain extent, but you can edit on side #1 only.

As you can see, each of these ideas has drawbacks as well as advantages, and, in the end, we have to admit that there is no such thing as a perfect system that will organize our programs for us and make them fit the standard lengths of tape. In practice, I have found that a combination of methods gives the best results. Before I record a composition, I always check its playing time. If I'm lucky, it will be just the right length to finish up one of my partly-used tapes. However, that happens *very* rarely. I usually have to add an extra length of tape to make it come out right, or else I use the Flying Splice and continue the selection onto another reel.

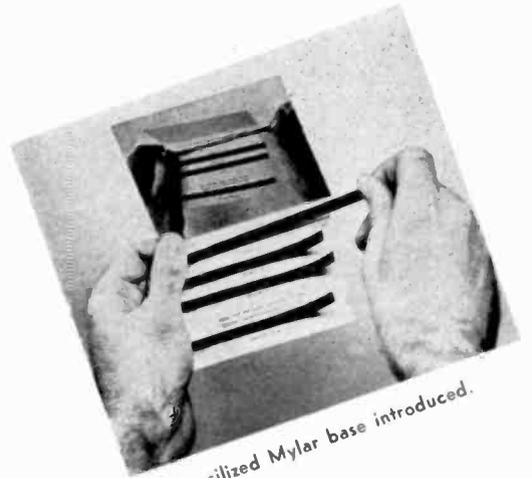
Either singly or in combination, these methods are sure to give you more recording time for your money. Just as important as that, though, is the programming that results from your efforts. This is so much a matter of individual taste and preference that there is very little to say about it. *You* are the person who has to be satisfied with the end product. If you have the feeling that you will enjoy listening to all the selections from one end of a tape to the other, and if you feel they all belong on the same tape, then you can be pretty sure you are on the right course.



Sound pac tape machine.



Telectro 4 track recorder.



Tensitized Mylar base introduced.

# 1958 Round up

... Industry developments  
from the past year

**T**HE year 1957 was an excellent year for the tape recording industry. In that year more recorders were sold than in any previous year in history. 1958 began the same way; stereo was on the move and tape was the only way in which it could be had.

But along about in the spring of the year a stereo disc appeared and shortly thereafter Electro-Voice brought out a stereo phono cartridge and the fun began. Owners of stereo tape machines found stereo tapes harder to get as some dealers panicked and cut back on their stocks, yet mail-order tape sellers showed growing sales.

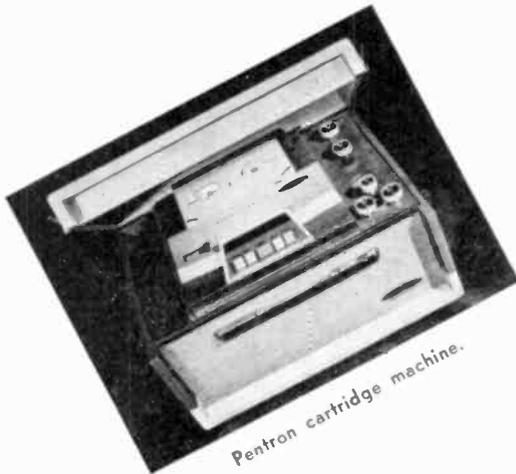
Now that the books for 1958 are



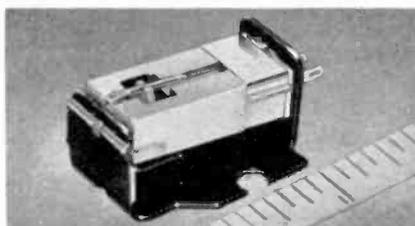
New Revere stereo.



Magnecord PT-6 returns.



Pentron cartridge machine.



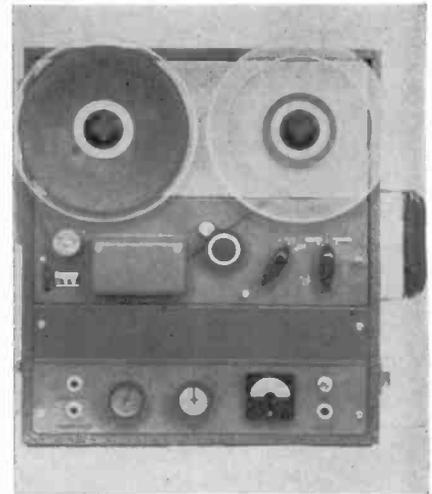
E-V stereo phono cartridge.



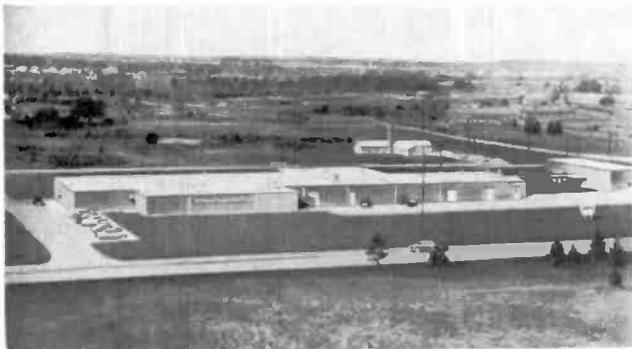
Pentron stereo recorder.



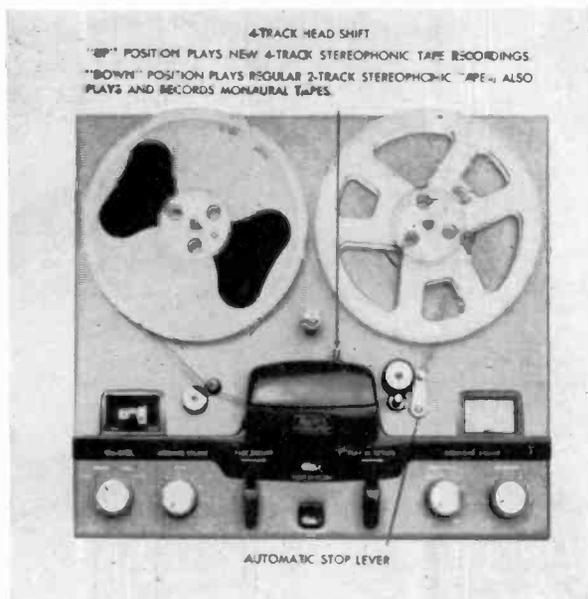
Stencil-Hoffman transistorized portable recorder.



Roberts recorder, an imported machine.



New ORRadio plant at Opelika, Ala.



Ampex 4 channel stereo tape recorder.

about closed the swing is beginning to move back to tape for stereo sound. In order to compete, price-wise with the cheaper stereo disc, some manufacturers of tape recorders have brought out four track machines and doubtless 1959 will see an increase in the number of four-track tapes available.

RCA announced its tape cartridge machine in July but production was not achieved until December. A number of cartridge loaded tapes, four track and running at  $3\frac{3}{4}$  ips were shipped from the RCA plant in October. The machines, RCA promised would be in the hands of dealers before Christmas.

Meanwhile, it was realized that all the "bugs" had not been ironed out of the stereo disc and the associated equipment. Tape, with five years of stereo experience behind it still led in the amount of material available and in promise for the future.

The tape manufacturers were gearing for greater production, both of tape for audio use and for instrumentation. ORRadio Industries opened a new plant at Opelika, Alabama. Reeves Soundcraft increased the capacity of its plant at Danbury, Conn. and moved its offices there. Audio Devices doubled its capacity and the new Minnesota Mining plant was running at top speed to fill the demands. Ferrodynamics likewise picked up and brought out a new tape package. Minnesota Mining retired their #112 tape which was designed for the first tape recorders made in this country. A few machines still used it 10 years after it had been first introduced.

With the announcement of four track stereo, firms producing tape recorders also announced recorders capable of recording stereo. This, coupled with the great increase in stereo broadcasting, especially in the metropolitan areas, bodes well for the coming year.

Magnecord brought back its PT-6 series of recorders because of popular demand and V-M was providing kits to convert the staggered machines to stacked and staggered.

The Armour Research Foundation announced a new type of tape cartridge in November which, with the addition of some simple mechanisms, could be played on an ordinary recorder. It is not known if any firm will endeavor to manufacture it and make it available to the public.

The proposed 10% tax on tape recorders went down to defeat in the Senate Finance Committee after the Magnetic Recording Industry Association and associated companies points out the facts to the Senators.

Tape recording generally, while temporarily slowed by the appearance of the stereo disc, picked up because people bought recorders because they recorded, not because they could play back stereo. Taping broadcasts off the radio and TV continued to be popular and thousands continued to find their machines immensely useful in their daily lives.

Imports of recorders by such firms as Tandberg, Ercona Corp. (Ferrograph) and Norelco continued and the latter firm introduced an excellent tape dictation machine.

1958 also saw the beginnings of another drop in tape speeds for music reproduction. Long the standard of the industry, 7½ ips seemed on its way to becoming a secondary standard as improvements in head construction and extremely narrow gaps brought the response at 3¾ ips above its former range.

Feeling on the advisability of this step was mixed among the manufacturers, some, such as Ampex brought out four track machines whereas firms such as Magnecord announced that two track 7½ ips stereo was the best for high fidelity reproduction. Pentron, Tandberg, and Telectro had four track machines available, the other manufacturers had not announced four track machines by the end of the year.

Tape recorders were achieving the "decorator look" and were more attractive packages designed to fit into the living room. A number of tape firms redesigned their boxes too.

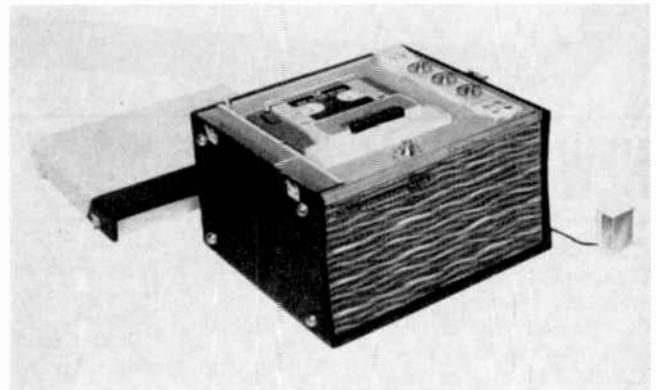
Videotape continued to make inroads in the use of motion picture film in TV, as was expected. 1959 should see more and greater acceptance of tape in all fields.

In fact, 1959 could well become the beginning of the age of tape. Already serious research is being done in the field of teaching our children with tape, a large firm has stated that five years from now all music will be on tape except pop singles for the rock and roll set and tape machines installed in music dealers shops may make obsolete and underprice the conventional phono disc.

Already kingpin of the automation and instrumentation fields, the outlook for the future of tape was never brighter.



V-M conversion kit for stacked and staggered.



RCA cartridge tape recorder.

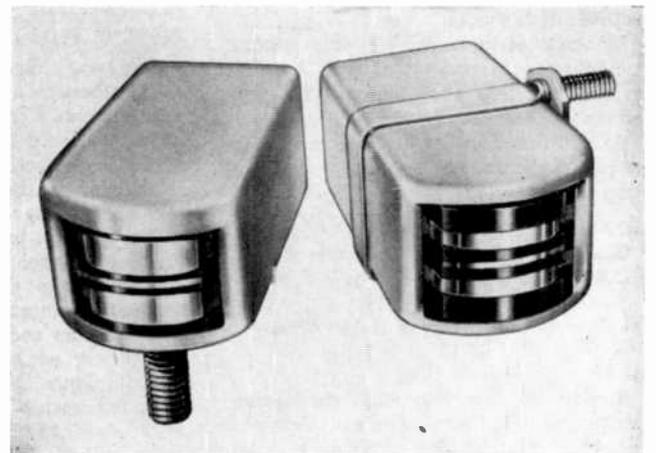
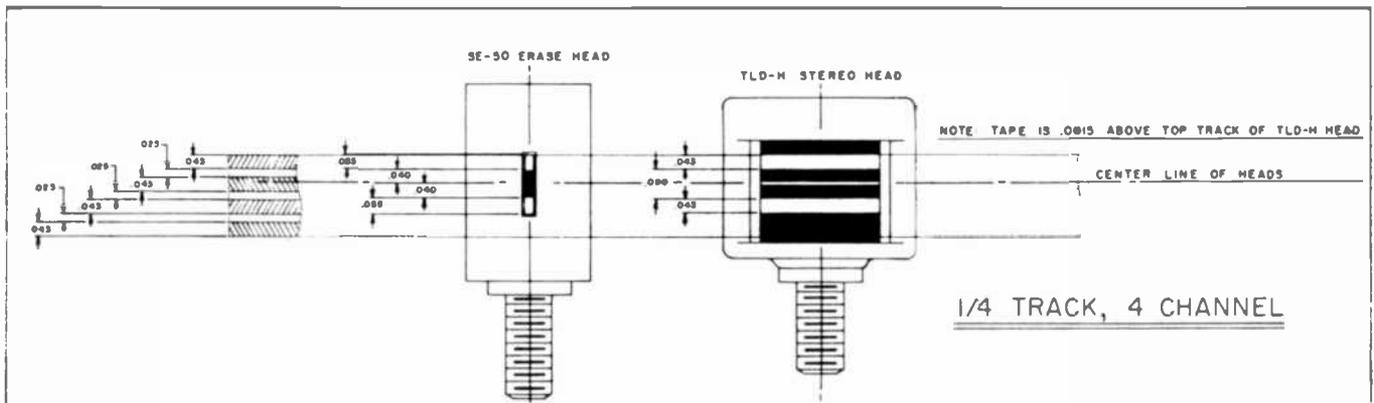


Photo shows difference between two and four track heads.



Drawing shows how 4 channel tapes interlace 2 channels at a time—one set playing in each direction when tape is turned over.

# STEREO SECTION

## NEW TAPES

By Georgie Sigsbee

### CLASSICAL

#### STRAVINSKY

Firebird Suite  
Paris Conservatoire Orchestra  
Pierre Monteux, Conductor  
RCA BCS-88  
\$8.95 . . . 20:08 mins.

Superbly interpreted and recorded. In my opinion this is one of the best readings available of this work.

Monteux performs with supple control . . . delicate lyricism coupled with dynamic excitement . . . a truly masterful performance.

Spread, directionality, balance and depth are par excellence.

### CHAMBER MUSIC

#### MOZART

Quintet for Horn and Strings in E Flat,  
Quartet for Oboe and Strings in F, K 370  
K 407

The Fine Arts Quartet and Guest Artists  
CONCERTAPES 24-10  
\$11.95 . . . 33 mins.

The French horn commands the leading role in this light-hearted Quintet. Featured as soloist is the talented musician, John Barrows. Mr. Barrows may be familiar to some through the Concertapes recording of The New York Woodwind Quintet (#24-4).

The sound is brilliantly recorded with the solo instrument accorded full, rich tone.

The melodic Quartet is delightfully presented by the ensemble. Ray Still who is principal oboist for the Chicago Symphony, is the guest artist on this recording.

The soloists' collaborators are Leonard Sorkin, Abram Loft, Irving Ilmer and George Sopkin who comprise the excellent Fine Arts Quartet.

Chamber music such as this . . . recorded with expert touch by distinctive musicians . . . guarantees a truly charming recording and with stereo sound it becomes twice blessed.

### POPULAR

#### OTHER WORLDS OTHER SOUNDS

Granada  
Begin the Beguine  
Night and Day  
Poinciana  
That Old Black Magic  
Nature Boy  
Magic is the Moonlight  
Adios

Esquivel and His Orchestra  
RCA CPS-171  
\$10.95 . . . 24:38 mins.

The pianist, Esquivel, nimbly skips across the keyboard in these beguine flavored arrangements. Fronted by a 26-piece orchestra with further assist from the Randy Van Horne vocal group (most of the "vocalizing" is the latest in do dah's), they give rather lively renditions of the numbers.

The sound is bright and clear with many "pinpoint" stereo effects . . . guitar on one channel, piano on the other, etc. These modern arrangements are certainly not standard ones and perhaps that is why, for me, they do not have the smooth continuity I would desire. Maybe I have been subjected to too much of the relaxing, background-styled music. Or could it be that Esquivel leaned a little too much to the leeward in demonstrating his "utilization of the latest, most superstereophonic equipment . . ." Be that as it may various instruments are spotted in and out and do aptly highlight stereo reproduction.

### ROCK AND ROLL

#### ROCK 'n' BLUES 'n' ROLL

Wedding Picture  
Beneath the Moon  
Baby, Oh, Baby  
You're Like A Butterfly  
Turkey-Neck Stretch  
Blue Moon Keep on Shining  
Cupid's Arrow  
My Baby Has Gone  
Lou Perry and The Bella-Tones  
Chuck Royal and The Sharpsters  
Grady O'Neal and The Bella-Tones  
CAL-WESTERN STEREO CWS-ST-1  
\$6.00 . . . 17:03 mins.

This is definitely not for those of you who prefer classical or semi-classical type music. I honestly believe the teenagers who go for rock and roll will go for this tape, but we would suggest they skip over the first selection.

While we feel the fidelity on this tape could be better, we know the rock and rollers won't even notice. J. C.

### CHORAL

#### RELIGIOUS

#### THE VOICE OF PROPHECY SACRED STEREO TAPES

King's Heralds, Male Quartet  
Del Delker, Contralto  
Brad Braley, Organist  
VP-1-EST 30:15 mins.  
VP-2-EST 30:25 mins.  
\$8.95 each

The Voice of Prophecy Recording Company (Glendale, California) has as its initial releases two very fine tapes of religious songs. These hymns are delivered by a thoroughly competent quartet ably assisted and abetted by the pleasant contralto of Miss Delker and the skilled, yet subdued, touch of organist Braley.

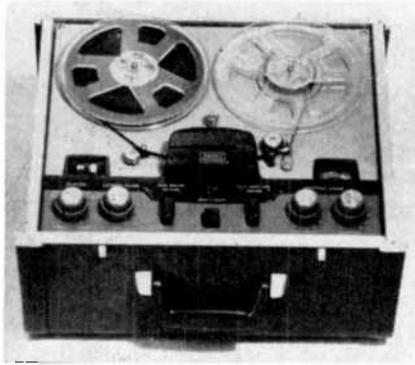
There are thirteen selections on each reel which include such numbers as "Tenderly He Watches," "God of Our Fathers," and "I See God." Diversification in presentation is achieved by utilizing not only the quartet but solo and duet work as well. All songs are sung with straightforward sincerity and warmth. This experienced group is heard weekly over the ABC, MBS and NBC radio networks on the Voice of Prophecy programs.

The recordings are handled with finesse and a keen insight into the advantages of stereo sound . . . placement and balance is properly maintained. During the duets one soloist is to the right, the other to the left, etc. The accompanist remains discreetly in the background lending good support to the singers.

These are very good offerings of sacred songs.

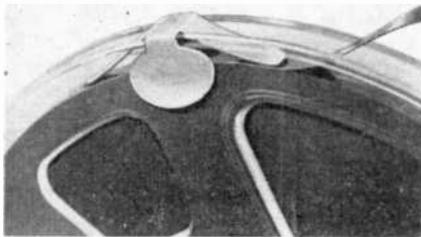
(Continued from page 9)

### AMPEX PORTABLE STEREO



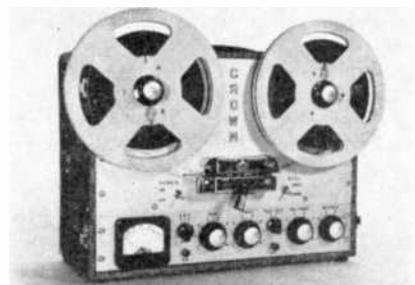
Ampex Corporation, 1020 Kifer Road, Sunnyvale, California, is marketing a new portable recorder which features stereo or monaural record, monaural, 2-track and 4-track stereo playback plus an automatic stop. This machine is known as the Caprice. It has three separate precision-engineered dual-track stacked heads. Positive-acting shift lever aligns heads precisely with recorded tracks on either 2-track or 4-track tapes. Ampex engineers have also designed an electronically and acoustically integrated system of components to match and compliment the Caprice. For price and further information contact the manufacturer.

### REEL-NEAT CLIPS



Toycos Products, Audio Division, 1712 W. Florence Ave., Los Angeles 47, Calif., has introduced Reel-Neat tape clips. According to the manufacturer, these are precision engineered of high quality polished stainless steel, and are designed to keep your reels of tape neatly wound. They simply snap on, and they sell in packages of 5 tape clips for \$1.00. For additional information, write to Toycos.

### GOLD CROWN PRINCE



International Radio & Electronics Corporation of Elkhart, Indiana, is now marketing the new Gold Crown Prince stereo which records and plays half-track mono-

aural and plays stereo to two cathode follower outputs. Frequency response is from 30 to 30,000 cps, plus or minus 2 db at the faster speed; flutter and wow is .07% at 15 ips. Other features include silver satin anodized aluminum, magnetic brakes, magnetic payoff and magnetic take up, fast forward and fast reverse, 3 motors, 3 speeds, two input channels, two microphone preamps and Crown "Micro-Mil" heads. This machine is priced at \$475. For additional information, contact the manufacturer.

### ROBINS KIT



An accessories kit for tape recorders is now being marketed by Robins Industries Corp., 36-27 Prince Street, Flushing 54, N. Y. The kit, TK4-STD contains a Gibson Girl standard tape splicer, splicing tape, tape threader, head cleaner, tape cleaning and lubricating cloth, tape clips, reel labels and a 24 page illustrated booklet by N. M. Haynes on Tape Editing and Splicing. This kit sells for \$12.00. Contact Robins for any additional information.

### BELL STEREO AMPLIFIER



Bell Sound Systems, 555 Marion Road, Columbus, Ohio, has introduced a new line of Pacemaker high fidelity amplifiers, which includes the 2221, a two-channel stereo amplifier. Built-in preamps on both channels are equalized to play magnetic and ceramic phono, FM-AM tuner and tapes. Inputs are provided for playback from tape heads and tape preamplifiers. Other features include new function switches on the front panel and hi and lo noise filters. Frequency response is 20-20,000 cps, plus or minus 1 db, and hum level is 65 db below 10 watts. For price and additional information, contact the manufacturer.

**USED STEREO TAPE BARGAINS—GUARANTEED PERFECT—ALL IN METAL STORAGE CANS — LARGE AND EXTENSIVE LIBRARY — SEND FOR FREE LIST — SAVE 50%!**

**ANGELUS TAPE SALES**  
BOX 7195, DAYTONA BEACH, FLORIDA

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Meetings, concerts, training aids, etc economically re-recorded on permanent hi-fidelity discs Professional quality—overnight service—all speeds—any quantity Write for Free Folder and Prices

**RECORDED PUBLICATIONS LABS.**  
1568-1580 Pierce Ave., Camden 5, N.J.

## A SOUND INVESTMENT

When we find one we don't hesitate. Hi-Fi TAPE RECORDING magazine will pay many future dividends in recording and listening pleasure. What's more you'll profit from the many tips on recording, money saving ideas, and up-to-date information from the "World's Leading Recording Magazine."

Last, but not least, where else can you invest at no risk. TAPE RECORDING's time honored "money-back guarantee" makes this investment the bluest of blue chips.

This practical magazine will bring you each month:

- Up-to-the-minute reviews of the latest tape releases in both monaural and stereo
- Consumer new product reports of recorders and equipment tested by our staff
- New products
- Newest developments in techniques which will improve your results
- The experience of recordists from all over the world.
- Plus—questions & answers—topes to the editor—tape club news—classified section, etc.

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(Continued from page 24)

has been proposed. It is a good one but one may draw a parallel with the home sound tape recorder. This is not used only for making funny voice recordings of the family. In cases too numerous to count the tape recorder is kept busy taping good music and other entertainment, from the air. There is much live picture program material worth saving for at least one or two re-runs. A member of the family may miss a regular show because of absence and would appreciate the chance to see it via video tape. Incidents of historical and educational interest are other candidates for a repeat performance.

#### Magnetic Tape the Ideal Storage Medium

Whether for hi fi sound, video or instrumentation data applications, tape is the logical recording medium. Taping of pictures calls for the storage of millions of bits of information in

a small space. Motion picture film does this well because the lens can put on all of the data for a single scene at one time. But processing takes time and once used the film is finished. Even though the television camera has a lens and places a complete scene on the raster the picture can be examined only one bit at a time by the scanning beam. While one part is being explored by the beam some three million other parts are waiting for inspection. Multibeam scanning may come in the future but as things stand the information has to be taken in sequence. This calls for an extremely rapid shifting of the inspection point from one location to the next, and the tape must therefore move rapidly.

There is no medium that compares with magnetic tape for data handling in automation. Accurate in complex situations it can take on between three and four thousand bits of data per

square inch of surface, and feed out letters and numerals at almost 100,000 per second. In instrumentation work tape can absorb all of the facts on a punched card in four thousandths of a second. Tape can issue complete commands at the rate of 1,600 per second. It is so rapid that its team mates, the computers and interpolators, are released sooner for other jobs. Magnetic recorders in industry are making possible the manufacture of complex machined parts on a large scale production basis.

In spite of its capabilities tape is hard pressed when asked to record a television program. That it has been made to do it is a credit to the engineering brains that solved the associated problems. Every component of the video tape system is pushed to its limit in picture recording. The coming video home recorder is a challenge for tape and the scientists that work with it.

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## BOOK REVIEWS

*More Fun With Your Tape Recorders and Stereo.* Co-authored by Michael Sheridan and Elsie Lee, one of the country's leading and most successful freelance writing teams. 6½ x 9½ inches, paper bound, illustrated. 128 pages, 75c. Published by Trend Books Inc., 5959 Hollywood Blvd., Los Angeles 28, Calif. National newsstand distribution.

This compact publication is chock full of easily readable information for tape enthusiasts, and for those not yet acquainted with the whys and wherefores of the art.

Among the many useful sections are "Your Tape Recorder and Stereo," "Operating a Tape Recorder," "Microphone Placement," "Editing and Splicing," "Tape Recording Fun," "Do-It-Yourself Kits," "Care of Your Recorder," "All About Tape Clubs," and "How to Build Your Tape Library."

The authors are well acquainted with tape recorders and recording, having used this medium for interviews and transcription in their writing over a long period of years. They have gathered a great deal of information and condensed it into a well organized, useful book.

We consider this publication excellent for the beginner and a worthy addition to the library of the audiophile.

*Educators Guide to Free Tapes, Scripts, and Transcriptions.* Compiled and edited by Walter A. Wittich, Ph.D., Professor of Education, formerly Director, Bureau of Audio Visual Instruction, University of Wisconsin, and Gertie Hanson Halsted, M.A., formerly Director, Radio Workshop, Wisconsin State College. 8½ x 11 inches, paper bound. 229 pages, \$5.75. Published by Educators Prog-

ress Service, Randolph, Wisconsin.

Again this book has grown fatter, as it has done yearly, as more and more material becomes available. The book contains discussion on Audio Materials and Instruction, Selecting Playback Equipment, and Selecting and Ordering Audio Materials. It lists the titles of tapes, scripts and transcriptions, the running time of each, terms and conditions of loans, names and addresses of agencies, availability, and it includes sample scripts. There is also a title index, subject index and a source and availability index. Sections are in different colors to make a clearer separation. This edition has 80 free tapes, 306 free scripts, and 117 free transcriptions. New listings are starred.

The materials listed are not to be found in any other single source. This book gives the busy, alert educator and librarian information on the nature, purposes, and use of these materials. Many of the scripts have multiple parts which will permit real classroom production and recording.

To those who require the use of audio instructional materials, this book is highly recommended.

*Tape Recorded Manual, Volume 1 Photo-fact Publication.* TR-1, Howard W. Sams Co., Indianapolis, Ind., 8½" x 11", paper bound, \$2.95.

This volume covers the Ampex 612, Bell RT-75, Columbia Records 560A, Ekotape 250-255 and 260 and 261, Ellamac Language Master, Magnecord F-35-B, Silvertone 7074, V-M 710, 711, 750 and Wilcox Gay 651 and 674.

Complete breakdowns are given for each machine plus trouble shooting pointers and advice.

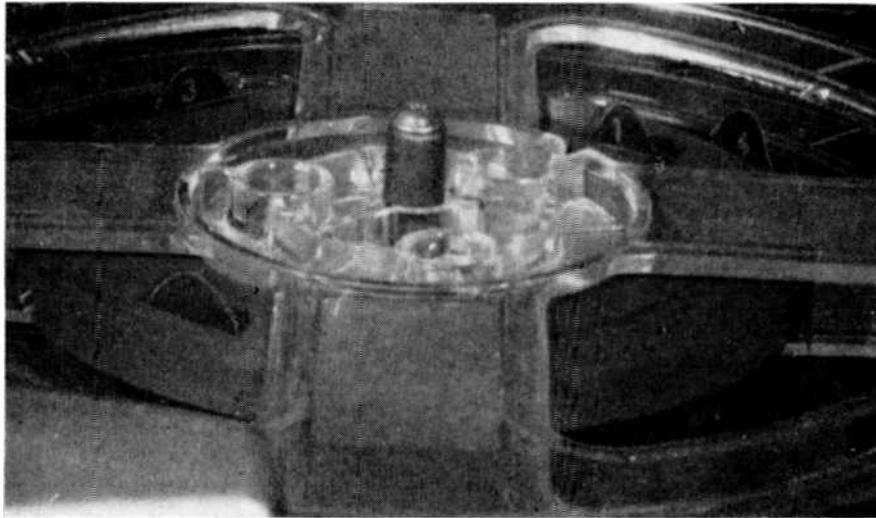
# NEW PRODUCT REPORT

STA **F**OKSTED

**Product Tape-idx®**

**Manufacturer: Datrel Co., Inc.**  
520 Fifth Ave., New York 36,  
N. Y.

**Price: Box 360 locators, 360  
selection labels, 60 reel labels,  
60 box labels—\$9.00**



## DATREL TAPE INDX®

*... Mylar base "flags" spot any portion of tape without difficulty.*

**F**INDING a specific spot on a tape has always been a chore involving counters on the machine and book-keeping on the back of the tape box.

The Datrel Company seems to have come up with an easily workable method that is not too much trouble nor too complicated for indexing the tapes.

Basis of the system is a set of numbered tabs which are applied directly to the shiny side of the tape where they will remain until removed.

The tabs are available in different colors so that different types of material on the tape may be indexed. Provided for each reel also is a number of index labels to be applied to the reel and small labels for numbering the reels.

The tabs are made of 1½ mil Mylar and the adhesive on them is the same

type as is used for splicing tape. Once applied, and they go on very easily, we found that ordinary usage could not dislodge them.

As the part which projects above the tape edge is very flexible, it will pass through tape guides and pressure pads without tearing.

As is the usual case when we get something to test, we gave the Tape Indx tabs "the works." In all we tried them on five different recorders and on reels with open spokes and on reels which had solid flanges.

There was no appreciable wow noticeable when the tabs went past the heads on three of the machines, one produced a slight wow and the other a very noticeable wow. No difficulty should be encountered on machines which do not employ pressure pads or have very light pressure on the pads.

However, on machines with heavy pressure, and especially if the pad fits into a recess in the head, some wow will be produced.

This is relatively unimportant because the use of the tabs will mostly be confined to spotting certain parts of a tape and usually they will be applied at the beginning or end of a selection rather than in the middle of it. Consequently we do not hesitate to recommend their use.

As mentioned above, we also tried them on a number of types of reels. As the tape goes on a solid reel, the tabs are bent over and lie parallel to the reel flange. This does no harm and they will again resume their upright position when they come out from under the reel flange.

If, in fast forward or rewind, the tabs should be bent all the way over so that they are caught by the next turn of tape, no harm is done and they may be straightened out with the fingers.

The company also has a master file with removable cards for keeping an index on a library of tapes and also a perma-file wallet which holds 60 or more selection labels.

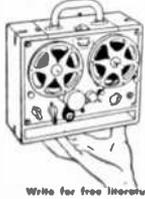
The tabs may be removed from the tape at any time and will come away clean, not leaving any adhesive on the tape.

You can get full details from Datrel. All in all, this seems like a practical and workable system.



Left: tape tabs are easily applied to shiny side of tape. When indexing the tab should be applied after the particular spot has passed the head so the exact spot may be marked. Center: tabs lie flat against the tape when wound on the reel but will pop up as they clear the flanges. Number shows both against the tape and on the tiny flag portion that sticks up. Right: selection labels are pre-gummed and may be removed and reused.

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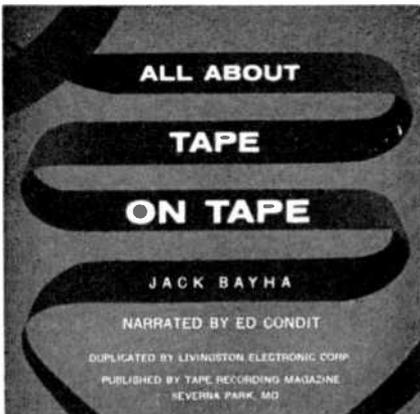
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FOR SALE: Brush "Soundmirror" tape recorder, \$50; Wagner-Nichols disc recorder, \$50; Webcor record changer, G.E. RPX050A Cartridge, \$20; Electrovoice Model 606 differential dynamic microphone, \$20; hearing aid, \$10. Marilyn Phillips, 311 Penfield, Rockford, Illinois.

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PROFESSIONAL 25-ohm British Lustraphone dynamic microphone; crisp characteristics, extended high frequency. New, \$23. Lee, 185½ So. Virgil, L.A., California.

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BRAND NEW 1959 GBC Sub-Miniature tape recorder and dictating machine imported from Italy—AC or DC, use in home, car or boat, complete with briefcase, in sealed factory carton-guaranteed Cost \$200.—Sacrifice \$139.95. Jack Fives, 2916 Rockrose Avenue, Baltimore 15, Maryland.

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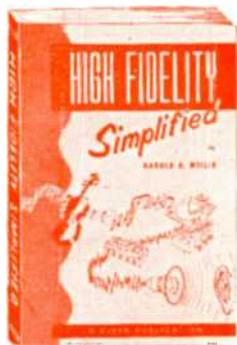
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