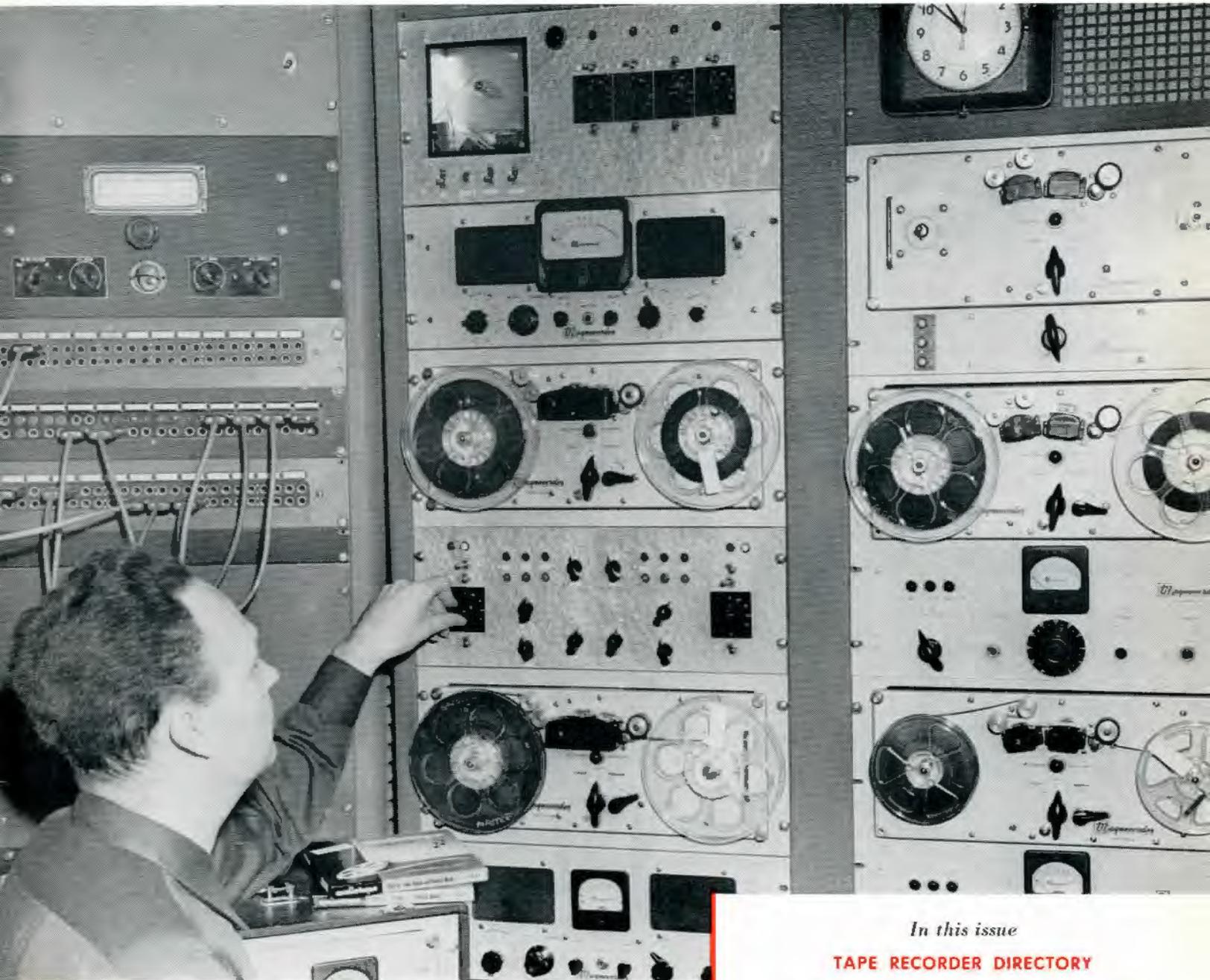


audio record

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audiorecords
audiotape
audiofilm
audiopoints



Chief Engineer Lyle Thompson checks a starter set-up on bank of Magnecorders used for recording Midnight Sun programs in Keating Studios. The unique automatic starting equipment used here is described in Mr. Thompson's prize-winning article on Page. 2.

In this issue

TAPE RECORDER DIRECTORY

- **Automatic Start for Taped Programs**
- **Musical Experiments with Tape**
- **Recorder Quality Control**
- **"Tape and Film Recording"**
- **Audio Engineering Society Elects New Officers**

AUTOMATIC START FOR TAPED PROGRAMS

by Lyle C. Thompson, Chief Engineer, John Keating Co., Seattle, Wash.

Third Prize Winner in Audio Devices' Sound Recording Contest

Although the John Keating Co. has been in the commercial recording business for thirteen years, the particular operation we are interested in here started late in 1948. It was then the Midnight Sun Broadcasting Company, operating station KFAR in Fairbanks and KENI in Anchorage, Alaska, brought us their problem of economically bringing stateside network programs to its listeners.

Great distances coupled with extreme weather conditions, made radio relay pick-up by the stations impossible. The alternative—making disc recordings of the network shows in the states and shipping them in by plane—was too expensive for a large scale operation. You will remember that in 1948 tape recording was still quite new and was not yet being used on any large scale commercially. However, it was decided to use tape for this job as soon as quality equipment could be obtained. Magnecorders were picked for the job and orders were placed for all stations as well as our studio in Seattle. Delivery of the Magnecorders was set for early spring 1949.

Midnight Sun's schedule called for initial operations to start late in 1948. However, difficulty in equipping all three locations to handle the operation on tape made it necessary to start with existing conventional disc recording equipment on a limited basis.

Even on a small scale, costs with discs were high. There was a continual outlay for new recording materials since the discs could not be reused. Also the shipping cost per show was more than doubled with discs than with tape.

By spring of 1949 the Magnecord equipment began to arrive. As it was installed, more and more shows were put on tape and fewer on discs. Finally the tape recording program was in full operation. More shows were added to the schedule and about forty hours of programs a week were being recorded in Seattle and flown to Alaska.

By the end of 1949 we found we had one problem that was keeping the efficiency of the operation below par. Because our regular studio and other commercial recording, in addition to the Midnight Sun operation, is done by only one engineer on duty at a time, the problem of starting network recordings on time was a large one.



The author, Lyle Thompson, checks his cam-operated Automatic Starter Switch, used at Keating Studios to control the operation of a bank of Magnecorders which record NBC, ABC and MBS programs for Midnight Sun Broadcasting Company.

There may be periods of a half hour or an hour when no network show is recorded. If the engineer was engrossed in some other recording job it was easy for the time for recording the next net show to sneak up and pass with a subsequent loss of a part of the show.

It was then decided to design and build a glorified alarm clock that would automatically ring a buzzer for a few seconds one minute before each fifteen minute program break. This had hardly advanced beyond the thinking stage when it was seen that with a little elaboration the "alarm clock" could be made to start the recorders automatically. So, our automatic starter was designed.

Here, briefly, is what it does and how it does it. Most all network shows start straight up on the hour, quarter past, half past, and quarter to the hour. They all end 30 seconds before the next show starts on the net line. This leaves 30 seconds "dead air" on the line between shows. With the automatic starter any one of our recorders can be set up as much as an hour before the program to be recorded is scheduled to start. When the time comes the recorder will be started automatically just

10 seconds before the program comes on the line. This gives 10 seconds of clean tape before the show starts because the recorder starts during the "dead air" time between shows on the network.

The Automatic Starter has on its panel, for each recorder, a manual-automatic switch and a starting time selector switch. With the manual-automatic switch in the manual position, the recorder can be started or stopped manually with its own controls. Just as if the Automatic Starter were not there. When the manual-automatic switch is in the automatic position the recorder will not start when its forward switch is "ON". See fig. 1.

Setting up for an automatic start is as follows: Tape is threaded on the recorder and the desired network is patched to the recording amplifier. (We take NBC, ABC and MBS network shows for Midnight Sun stations). Then on the Automatic Starter the manual-automatic switch for the recorder being set up is switched to automatic. Now the recorder can be turned "ON" but will not run until the starting relay closes. Fig. 1. Next the time selector switch is set to the desired starting time. The recorder will then start 10 seconds

audio  **record**

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before the program starts on the line.

There are four starting times per hour provided. They are on the hour (indicated by "60" on the time selector), quarter past (indicated by "15"), half past (indicated by "30"), and quarter to the hour (indicated by "45" on the time selector). Each of these has a one hour cycle, so programs can be set up anytime within an hour before they are to be recorded.

Needless to say this Automatic Starter has eliminated late starts completely. It also has the buzzer that sounds for about 10 seconds, one minute before each starting time, every fifteen minutes. Also there is a red light that comes on after any interruption of power to the clock motor. Such an interruption would make the clock slow and late starts would result.

Radio station personnel who have seen this starter have shown considerable interest in it. As a result we have built several more of these units which are now in use in radio stations.

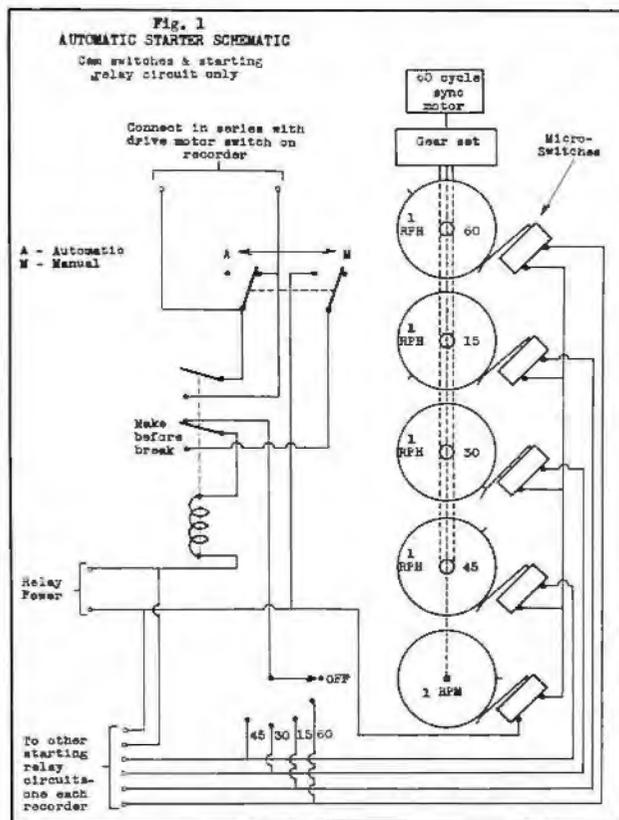
This system has worked so well that the number of network shows was increased. Today about 67%, some 80 to 90 hours weekly, of *Midnight Sun's* programs are taped and shipped north.

Last Fall two more stations were added in Alaska; KJNO, Juneau and KABI, Ketchikan. This has almost doubled the number of tapes being recorded and shipped each week. Where we used to record one copy of a given show, we now record two copies. One copy makes the KENI-KFAR

circuit and the other copy makes the KJNO-KABI circuit.

Because the cost of this operation on discs would have been prohibitive, we feel this is an outstanding example of the in-

creased use of sound recording made possible by the advent of magnetic tape. And our Automatic Starter has greatly improved the efficiency of the operation, as well as simplifying it.



NEW MAGAZINE DEVOTED TO TAPE RECORDING



Tape and Film Recording, a new magazine which will cover all phases of magnetic recording, including the new magnetic-recording projectors, will make its bow with the November-December issue.

Living up to its slogan "The Magazine of Sound Ideas", it will feature the how-to-do-it angle to enable the legions of tape recorder owners to get the most pleasure from their machines.

NBC songstress Rosemary Clooney graces the cover of the first issue and the contents include such articles as "Omaha After Dark" by Don Loughnane who strapped a small recorder to his person and used a wristwatch microphone to pick up the sounds in the gambling halls in his native city. These he played over his radio show on KOWH and started a move for a town cleanup. Another article, by Mildred Stagg, tells how to make money with a tape recorder and a third, by Emil Brodbeck, TV film producer and author, tells how to add sound to your Christmas movies. Harold E. Weiler, author of *Hi-Fidelity Simplified* writes on hi-fi tape techniques. In addition there will be such departments and columns as: Questions and

Answers—at your service; New Products, Consumer reports on new equipment, how to make sound effects, etc.

The editor will be Mark Mooney, Jr., former editor of *Camera Magazine*.

The first issue will be available through photo, radio and music shops or by direct subscription. The subscription price for the six bi-monthly issues a year has been set at \$2.00 and the publisher is making a special pre-publication offer of four issues for \$1.00 with a money-back guarantee if the magazine does not satisfy the subscriber. Charter subscriptions will be accepted up to the appearance of the second issue which will be the January-February number.

Tape and Film Recording will be published by Mooney-Rowan Publications, Inc. with offices in Severna Park, Maryland. Subscriptions may be sent direct to the publisher at that address.

MUSICAL EXPERIMENTS WITH TAPE

by Mortimer Goldberg, CBS Radio AM Technical Operations Dept., N. Y. C.

Another Third Prize Winner in Audio Devices' Sound Recording Contest

In my work with tape recording, I have been fortunate enough to delve into an experimental stage of this newest and most promising recording medium.

To qualify my statement of the experimental stage, I will be specific in describing two particular programs which I recorded and edited.

The idea of the first program was to enable the listener to easily discern the intricate combination of sounds comprising a bird call. Normally, a bird call is made up of a very rapid succession of notes which when heard normally in their natural state are more or less a blur of high frequency notes, but nevertheless beautiful to listen to. However, with the use of recording tape, we were able to reduce the speed of the bird call so as to easily hear each individual note of its call. The final effect sounded like expert whistling and with each reduction of the tape speed, the call was reduced another octave. In this way, the very high frequency notes were brought down in the middle whistling range and at the same time each note was increased in duration, thereby reducing the complexity of the combination of notes.

The actual mechanics were accomplished by dubbing the original call at half speed (15 ips to 7½ ips). From 7½ ips it was dubbed again to 30 ips and then played back at 15 ips, resulting in the reduction of speed twice on the overall and maintaining 15 ips, which is our standard recording and play-back speed.

All the bird calls were handled in this way and a running commentary was mixed with the various calls explaining each bird, its origin, etc. The sound of the birds in their natural state and the slowed-down process were present throughout the program in front and behind the narration. The narration itself was tape recorded and three tape recording machines were utilized to mix the narration with the bird calls. The calls and narration were synchronized in sections, so as to correspond with each other and then each section was edited together.

The success due to the unusuality of the bird program, prompted us to go fur-

ther into the experimentation with tape and to create a program which would explain simply not how sounds are created exactly, but what combinations of pitches and harmonics determine certain sounds, which we are accustomed to hearing. These sounds when changed are not only altered as to pitch, but their characteristics are altered so as to appear in some cases like sounds never heard before.

In order to illustrate that musical sounds are composed of the fundamental tones plus overtones or harmonics, we recorded on tape the sound of middle G being struck on the piano. Listening carefully to this sound, the various harmonics comprising the note are easily discerned. To separate the various overtones from the middle G (the fundamental), we recorded by use of an audio oscillator, the pure tone of middle G (384 cps), along with the harmonics, (768, 1536, 3072 cps) etc. All these frequencies played in sequence, illustrated the pure harmonic-free tones comprising the single sound of middle G on the piano which in its original form is very rich in harmonics.

We then recorded a simple tune (Twinkle, Twinkle Little Star), played on a flute which is a very high pitched instrument, and on a tuba a very low pitched instrument. In order to accomplish the experiment, which I will describe shortly, we recorded the notes of the tune individually. The musicians held each note as long as they could without wavering. Out of each individual sustained note played, two seconds was cut out and spliced together to build up the tune. The musicians also played in unison (normally) a duet of the tune which we recorded. The flute played the melody and the tuba the obligato. Now to go farther with the experiment, the purpose of which was to increase the pitch of the tuba so as to be in the flute range and decrease the pitch of the flute to the tuba range.

The normal flute range was three octaves higher than the tuba and it was our desire to decrease the pitch of the flute three octaves and this was accomplished by decreasing the tape speed to one quarter the normal speed. As I mentioned before, the musicians played the individual notes comprising the tune for two second duration and then the notes spliced together to accomplish the tune. In the case of the flute where a speed reduction was necessary, the duration of each note for normal playing was made one half second. This tune was

then dubbed at one half speed and now each note was one second duration. To keep the timing and tempo of the tune the same as the original, each note was cut to one half second once again. The same process was repeated again by halving the speed or making it now one fourth of the original speed, and again the tape was edited to maintain the one half second note duration. We now have decreased the pitch of the flute, placing it in the playing range of the tuba. The identical process was done in reverse for the tuba. Beginning with notes of two second duration and doubling the speed once, brought the tuba pitch up one octave and decreased the duration of the note to one second. When doubled again in speed, the pitch was brought up a total of three octaves and the notes were of half second duration, the same as the flute. The two resultant tapes were mixed and rerecorded in unison resulting in a tuba and flute duet, the difference being that each instrument was placed in the playing range of the other. The sound accomplished from this being entirely impossible to play normally, and only possible through the fascinating medium of tape recording.

The above experiment of course, having been done with regular musical instruments resulted in the tones being rich in harmonic content and in order to illustrate how the tune would sound in the pure tones of the fundamental notes, the tune was reproduced by recording the notes with an audio oscillator. The higher register notes of the flute was used as the standard and it was accomplished in the following manner.

A closed loop of each was made and the audio oscillator was swept along its range observing the Volume Indicator for indication of a beat. By the wavering of the V.I. as a result of the beating together of two identical frequencies, that frequency of the audio oscillator was recorded and hence the entire tune was built up of pure fundamental tones.

The next major step in this experimental program was to show how the reversal in playing tape not only accomplishes a changing characteristic of the original sound, but how tape can be used to accomplish special effects never before heard.

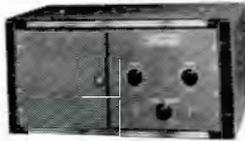
Our means to indicate this was with the use of the piano. The pianist played the

(Continued on Page 18, Col. 3)

QUICK FACTS ON MAGNETIC TAPE RECORDERS

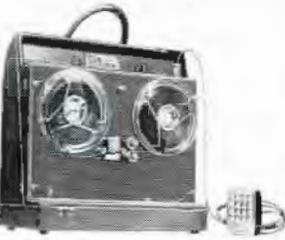
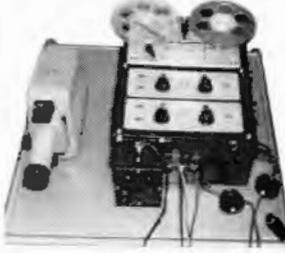
(Additional information can be obtained by writing to the manufacturer)

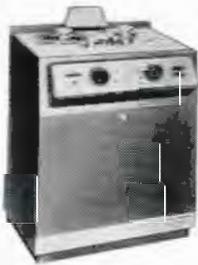
Manufacturer	Model and Price	Frequency Response	Data	Tape
AMPEX ELECTRIC CORPORATION 934 Charter St. Redwood City California	 <p>Portable Model 400-A (Dual Track) Model 401-A (Single Track) \$985.00</p>	<p>30-15,000 cycles (± 2 db) at 15"/sec. 30-15,000 cycles (± 4 db) at 7 1/2"/sec.</p>	<p>Portable, single or dual-track recorder, with tape speeds of 15 and 7 1/2" per second. Signal-to-noise ratio, over 55 db at either speed. Either half-track or full-track recordings can be played back without changes in adjustment. Separate record and playback heads. Instantaneous starting. Rewind time, 1 1/2 min. Simultaneous monitoring. Weight—approx. 80 lb.</p>	
	 <p>Console Model 300-C \$1,860.00</p>	<p>30-15,000 cycles (± 2 db) at 15"/sec. 30-15,000 cycles (± 4 db) at 7 1/2"/sec.</p>	<p>Professional-type, single-track recorder, with tape speeds of 15 and 7 1/2" per second. Signal-to-noise ratio, over 60 db. Separate record and playback heads and amplifiers. Rewind time, 1 min. for full NAB reel. Design flexibility permits modifications for special applications, including multi-channel recording and response beyond 80 KC. Custom built instrumentation machines available with response to 100 KC. Also available in portable and rack-type units.</p>	
	 <p>Console Model 350 \$1,195.00</p>	<p>30-15,000 cycles (± 2 db) at 15"/sec. 30-15,000 cycles (± 4 db) at 7 1/2"/sec. 50-7,500 cycles (± 2 db) at 3 3/4"/sec.</p>	<p>Professional-type, single or dual-track recorder, available with tape speeds of 15", 7 1/2" and 3 3/4" per second. Signal-to-noise ratio 60 db (single-track) or 55 db (dual-track). Separate record and playback heads and amplifiers. Playback accuracy $\pm 0.2\%$ (3.6 seconds in 30 minutes). Rewind time, 1 minute for NARTB 2400-foot reel. Push-button controls: Start, Stop, Fast Forward, Rewind; Built-in pre-amplifier. Reel size switch adjusts tape tensions for 10 1/2", 8" and 7" reels. Also available in a two-case portable or for rack mounting.</p>	<p>Wound with OXIDE IN</p> <p>Red Oxide, Plastic Base Recommended</p>
	 <p>Stereophonic Recorders Model 350-2 (Two Channel) \$1,695.00 Model 350-3 (Three Channel) \$2,175.00</p>	<p>30-15,000 cycles (± 2 db) at 15"/sec. 30-15,000 cycles (± 4 db) at 7 1/2"/sec.</p>	<p>Professional-type machines for two channel or three channel stereophonic recording. Separate recording and playback amplifiers handle inputs to and outputs from each channel in the multi-channel record and playback heads. Individual meter panels are provided for each channel. Tape transport mechanism and controls identical with standard Model 350 machines. Also available in console or in portable cases.</p>	
	 <p>Portable Tape Reproducer Model 450 \$635.00</p>	<p>50-7,500 cycles (± 2 db) at 3 3/4"/sec.</p>	<p>Eight-hour, dual-track tape reproducer for background music systems. Tape speed, 3 3/4"/second. Pre-recorded tape on 14-inch reel provides four hours of continuous, un-repeated program material on one half of the tape. When reel is unwound, it automatically reverses and plays four hours more on other half of tape. Machine keeps playing until turned off. Signal-to-noise ratio, better than 50 db. Options available include: Portable, Console, or Rack Mounting; manual or automatic reverse; 7 1/2"/sec. tape speed.</p>	
	AMPLIFIER CORPORATION OF AMERICA 396-398 Broadway, New York 13, N. Y. (Continued on next page)	 <p>"Twin-Trax Magnemuse" Model 810B (7 1/2"/sec.) \$285.00 Model 810C (15"/sec.) \$345.00</p>	<p>50-9,000 cycles (± 3 db) at 7 1/2"/sec. 30-13,000 cycles (± 2 db) at 15"/sec.</p>	<p>Portable, dual-track recorder, with automatic reversal—giving up to 1 hour continuous play on 7" reel. Dynamic range, 45 db. Input channels for microphone and radio-phonograph. Total distortion, less than 3%. Shuttle speed in both directions. Weight—42 lb.</p>

Manufacturer	Model and Price	Frequency Response	Data	Tape																			
AMPLIFIER CORPORATION OF AMERICA 396-398 Broadway, New York 13, N. Y.	 <p>"Twin-Trax Magnorama" Model 9108 \$495.00</p>	<p>50-9,000 cycles (± 3 db) at $7\frac{1}{2}$" / sec.</p>	<p>Portable, dual-track recorder, with $7\frac{1}{2}$" tape speed and automatic reversal — giving 4 hours continuous play on $13\frac{1}{2}$" reel. Microphone included. Weight—55 lb. Other data same as for "Twin-Trax Magnemuse" on preceding page.</p>																				
	 <p>"Magnemite"</p> <p>Battery Operated, Spring Motor Drive</p>	<table border="1"> <tr> <td>Model 610-A (Dual Track)</td> <td>\$275.00</td> </tr> <tr> <td>Model 610-B (Dual Track)</td> <td>\$225.00</td> </tr> <tr> <td>Model 610-C (Dual Track)</td> <td>\$255.00</td> </tr> <tr> <td>Model 610-TD (Dual Track)</td> <td>\$275.00</td> </tr> <tr> <td>Model 610-SD (Single Track)</td> <td>\$295.00</td> </tr> <tr> <td>Model 610-E (Single Track)</td> <td>\$335.00</td> </tr> </table>	Model 610-A (Dual Track)	\$275.00	Model 610-B (Dual Track)	\$225.00	Model 610-C (Dual Track)	\$255.00	Model 610-TD (Dual Track)	\$275.00	Model 610-SD (Single Track)	\$295.00	Model 610-E (Single Track)	\$335.00	<table border="1"> <tr> <td>300-2,500 cycles at $15\frac{1}{16}$" / sec.</td> </tr> <tr> <td>100-3,000 cycles at $1\frac{7}{8}$" / sec.</td> </tr> <tr> <td>50-5,000 cycles at $3\frac{3}{4}$" / sec.</td> </tr> <tr> <td>50-7,500 cycles at $7\frac{1}{2}$" / sec.</td> </tr> <tr> <td>50-7,500 cycles at $7\frac{1}{2}$" / sec.</td> </tr> <tr> <td>50-15,000 cycles at 15" / sec.</td> </tr> </table>	300-2,500 cycles at $15\frac{1}{16}$ " / sec.	100-3,000 cycles at $1\frac{7}{8}$ " / sec.	50-5,000 cycles at $3\frac{3}{4}$ " / sec.	50-7,500 cycles at $7\frac{1}{2}$ " / sec.	50-7,500 cycles at $7\frac{1}{2}$ " / sec.	50-15,000 cycles at 15" / sec.	<p>Completely self-contained, battery-operated tape recorders with spring motor drive, especially designed for a wide range of remote recording work. Include provision for playback thru headphones or external amplifier. Dynamic range, 45 — 50 db. Winding interval, 3 to 30 min., depending on tape speed. Can be rewound while operating. Monitors through headphones. Weight, 10 — 15 lb. Overall dimensions, 11 x 8 x 5 in. for Model 610-A and B; 11 x 10 x 7 in. for all others. Complete accessory equipment available.</p>	
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 <p>"Magnematic"</p> <p>110 Volt, AC Portable</p>	<table border="1"> <tr> <td>Model 410-TC (Dual Track)</td> <td>\$335.00</td> </tr> <tr> <td>Model 410-SC (Single Track)</td> <td>\$345.00</td> </tr> <tr> <td>Model 410-TD (Dual Track)</td> <td>\$355.00</td> </tr> <tr> <td>Model 410-SD (Single Track)</td> <td>\$365.00</td> </tr> <tr> <td>Model 410-TE (Dual Track)</td> <td>\$375.00</td> </tr> <tr> <td>Model 410-SE (Single Track)</td> <td>\$385.00</td> </tr> </table>	Model 410-TC (Dual Track)	\$335.00	Model 410-SC (Single Track)	\$345.00	Model 410-TD (Dual Track)	\$355.00	Model 410-SD (Single Track)	\$365.00	Model 410-TE (Dual Track)	\$375.00	Model 410-SE (Single Track)	\$385.00	<table border="1"> <tr> <td>50-7,500 cycles (± 3 db) at $3\frac{3}{4}$" / sec.</td> </tr> <tr> <td>50-15,000 cycles (± 2 db) at $7\frac{1}{2}$" / sec.</td> </tr> <tr> <td>50-15,000 cycles (± 1 db) at 15" / sec.</td> </tr> </table>	50-7,500 cycles (± 3 db) at $3\frac{3}{4}$ " / sec.	50-15,000 cycles (± 2 db) at $7\frac{1}{2}$ " / sec.	50-15,000 cycles (± 1 db) at 15" / sec.	<p>Compact 110-volt AC Portable, weighing only 19 lb. complete. Takes reel sizes up to 5". Rewind time, $1\frac{1}{2}$ min. Fast forward, 60"/sec. Monitors through headphones. Push button control for: on, off, start, stop, record, reset, play, rewind. Solenoid operated, clutch controlled capstan drive. Built-in preamplifier for low-level (50/200 ohm) microphone input. Overall dimensions, $8\frac{1}{2}$" x 11" x 9". Operates on any 110/125 volt, 50/60 cycle power line.</p>	<p>Wound with OXIDE IN</p> <p>Red Oxide, Plastic or Paper Base</p>				
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 <p>"Electro-Magnemite"</p>	<p>Remote Control Dictation-Transcription Recorder</p> <p>\$294.00</p>	<p>100-3,000 cycles at $1\frac{7}{8}$" / sec.</p>	<p>A compact, light-weight tape recorder and reproducer designed specifically for dictation-transcription service. Uses standard 5" tape reels, recording for two hours at $1\frac{7}{8}$" per second. Push-button control on microphone permits instant starting and stopping, change from record to playback, and high speed backspace. Remote typewriter control for start, stop and backspace. Weight, 12 lb. Size, $11\frac{1}{2}$ x $9\frac{1}{4}$ x 6 inches. Can be equipped for fully automatic voice activation at a net price addition of \$90.00.</p>																				
 <p>"MagneLoop"</p> <p>Automatic Station Break Announcer</p>	<table border="1"> <tr> <td>Model 531C (60 seconds)</td> <td>\$221.00</td> </tr> <tr> <td>Model 531CL (120 seconds)</td> <td>\$249.00</td> </tr> <tr> <td>Model 531D (30 seconds)</td> <td>\$274.00</td> </tr> <tr> <td>Model 531DL (60 seconds)</td> <td>\$296.00</td> </tr> </table>	Model 531C (60 seconds)	\$221.00	Model 531CL (120 seconds)	\$249.00	Model 531D (30 seconds)	\$274.00	Model 531DL (60 seconds)	\$296.00	<table border="1"> <tr> <td>50-5,000 cycles at $3\frac{3}{4}$" / sec.</td> </tr> <tr> <td>50-7,500 cycles at $7\frac{1}{2}$" / sec.</td> </tr> </table>	50-5,000 cycles at $3\frac{3}{4}$ " / sec.	50-7,500 cycles at $7\frac{1}{2}$ " / sec.	<p>Endless magnetic tape loop recorder with remote control start and automatic stop, for station break announcements, sales messages, etc. Records and plays back any announcement, music or sound effect up to 2 minutes in length. Tape cartridges easily replaced. Provided with high impedance low-level mike input and ungrounded bridging input which is automatically disconnected by microphone plug. Output level ample for studio transmission and telephone lines. Mounted on standard $8\frac{3}{4}$" rack panel.</p>										
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50-7,500 cycles at $7\frac{1}{2}$ " / sec.																							

Manufacturer	Model and Price	Frequency Response	Data	Tape
AMPRO CORPORATION 2835 North Western Ave., Chicago 18, Ill.	 <p>Ampro "Champion" Model 731-R \$129.75</p>	<p>100-7,000 cycles at 3 3/4"/sec.</p>	<p>Portable, dual-track recorder with 3 3/4" tape speed—giving 2 hours of continuous playing on one 7" reel. Instant stop switch for accurate spotting. Microphone and direct radio, T.V. or phone connection. Rewind time, 4 min. for 7" reel. Includes microphone, 5" x 7" elliptical Alnico 5 PM speaker and jack for external speaker for 3 ohm voice coil or earphones. Weight—17 lb.</p>	<p>Wound with OXIDE IN Red Oxide, Plastic Base</p>
	 <p>Ampro "Celebrity" Model 755 \$229.95</p> <p>Ampro "Hi-Fi" Model 756 \$239.95</p>	<p>30-8,500 cycles (±3 db) at 3 3/4"/sec.</p>	<p>Portable, dual-track recorders. Wow and flutter less than 0.5%; reel capacity up to 7". Rewind speed, 120"/sec., fast forward 72"/sec. Electronic eye recording level indicator; automatic selection locator; dual action tone control; inputs for microphone, radio-phonograph, FM-TV, remote control; multiple output; power output 3.2 watts. Automatic instant stop in case of power failure, prevents tape spillage or breakage. Includes 6" x 9" Alnico 5 PM speaker and microphone. Weight—32 lb.</p>	
BELL SOUND SYSTEMS, INC. 555 Marion Rd., Columbus 7, Ohio	 <p>"RE-CORD-O-fone" Model RT-65-8 \$186.45</p>	<p>70-8,000 cycles (±3 db) at 7 1/2"/sec.</p>	<p>Portable, dual-track recorder with tape speeds of 1 7/8", 3 3/4" and 7 1/2" per second. Rewind ratio 6 to 1. Includes crystal microphone, 6" PM speaker, inputs for microphone and radio-phonograph, and headphone monitoring jack. Weight—33 lb.</p>	<p>Wound with OXIDE IN Red Oxide, Plastic or Paper Base</p>
BROADCAST EQUIPMENT SPECIALTIES CORP. 135-01 Liberty Ave. Richmond Hill 19, N. Y.	 <p>New Travis Tapak (tape-pack) "Newscaster" \$318.00 plus mike and headphone</p>	<p>100-6,000 cycles at 7 1/2"/sec.</p>	<p>Completely self-contained, spring-powered tape transport with battery amplifier. Field adjustable to either single or dual track recording. All functions: Record, erase, fast rewind, playback to headphone or external amplifier. Requires one cranking during 15 minutes. Speed constancy 1%. Recording preemphasis curve matches Ampex and Magnecorder. Operates with cover closed. Weight—17 lb. Size 14 x 10 x 6 in.</p>	<p>Wound with OXIDE IN Red Oxide, Plastic Base</p>
BERLANT ASSOCIATES 4917 West Jefferson Blvd., Los Angeles 16, Cal.	 <p>"CONCERTONE" Model 1501 Basic Recorder \$345.00</p> <p>Case with Amplifier and Speaker \$82.50</p>	<p>50-15,000 cycles (±2 db) at 15"/sec.</p> <p>50-10,000 cycles (±2 db) at 7 1/2"/sec.</p>	<p>Professional type recorder mechanism and electrical chassis. Interchangeable single and dual track heads. Tape speeds 15" and 7 1/2" per second. Signal-to-noise ratio, over 50 db. Fast forward and rewind time, 1 min. for 10 1/2" reel. Separate record, erase and playback heads. Monitors while recording. Weight, 50 lb., in case with 8" speaker.</p>	<p>Wound with OXIDE IN Red Oxide, Plastic Base</p>
	 <p>"CONCERTONE" Model 1502 Chassis \$445.00</p>	<p>50-15,000 cycles (±2 db) at 15"/sec.</p> <p>40-10,000 cycles (±2 db) at 7 1/2"/sec.</p>	<p>Similar to Model 1501 (above) but with direct tape drive by 2-speed hysteresis synchronous motor. Instantaneous starting. Timing accuracy, ±0.3%. Carrying case with speaker available. Weight of basic recorder—40 lb.</p>	
	 <p>"CONCERTONE" Network Recorder NWD-1 Drive Mechanism \$478.00</p> <p>NWA-1 Amplifier \$317.00</p>	<p>40-15,000 cycles (±2 db) at 15"/sec.</p> <p>40-10,000 cycles (±2 db) at 7 1/2"/sec.</p>	<p>Professional single or dual-track recorder with tape speeds of 15" and 7 1/2" per second. Signal-to-noise ratio, 55 db. Fast forward and rewind, less than 1 min. for 2500 ft. reel. Starting time 1/10 sec. Separate erase, record and playback heads with facilities for 5 heads. Monitors while recording. Includes manual editing facilities. Amplifier unit includes push-button interlock controls for all mechanical functions. Automatic instant stopping in case of power failure or tape breakage at end of reel. May be mounted in rack, portable cases (as shown), or console.</p>	

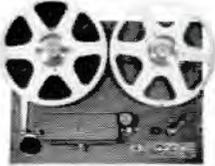
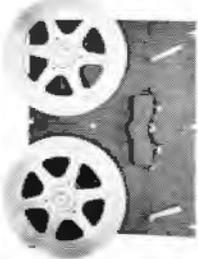
Manufacturer	Model and Price	Frequency Response	Data	Tape
THE BRUSH ELECTRONICS CO. 3405 Perkins Ave., Cleveland 14, Ohio	 <p>"Soundmirror" Model 455P \$289.50</p>	to 15,000 cycles at 7 1/2"/sec.	Portable, dual-track, dual-speed unit with recording time up to 2 hours on 7" reel. Signal-to-noise ratio, over 40 db. Total wow and flutter less than 0.3% RMS. Fast forward and rewind 10:1 ratio. "Magic Eye" recording level indicator. Inputs for microphone and radio-phonograph. Output for external speaker or PA system. Microphone and built-in speaker included. Weight—33 lb.	Wound with OXIDE IN Red Oxide, Plastic or Paper Base
CALIFONE CORPORATION 1041 North Sycamore Ave., Hollywood 38, Cal.	 <p>"Dynacord" Model C3-C3A Rack Panel \$799.00 Portable \$849.00</p>	50-15,000 cycles (± 2 db) at 15"/sec. 50-9,000 cycles (± 2 db) at 7 1/2"/sec.	Portable, single-track, dual-speed recorder designed to NAB Standards. Unique features include direct capstan drive from special slow-speed synchronous motor which eliminates flutter, and clutch-free dynamic braking of tape reels. Signal-to-noise ratio, over 50 db. Fast forward and rewind, 48 sec. for 10 1/2" reel. Three separate heads permit monitoring from tape while recording. Includes VU meter, 2-speed equalization, and separate record and monitor gain controls. Weight—44 lb. for C3 transport mechanism; 33 lb. for C3A amplifier.	Wound with OXIDE OUT Red Oxide, Plastic Base
CRESCENT INDUSTRIES, INC. 5900 W. Touhy Ave. Chicago 31, Ill.	 <p>Crescent "Compact" Recorders Model 903 (3 3/4"/sec.) Model 907 (7 1/2"/sec.) \$99.50 Each</p>	70-8,500 cycles at 7 1/2"/sec. 90-6,000 cycles at 3 3/4"/sec.	Portable, dual-track recorder available with either 7 1/2" or 3 3/4" per second tape speed. Fast forward and rewind, 80 seconds for full 7" reel. Wow and flutter, less than 0.5%. 3 watt amplifier. Inputs for microphone and radio-phonograph. Outputs for speaker and external amplifier. Includes microphone, built-in speaker, reel of tape and extra reel. Weight, 20 lb. complete.	Wound with OXIDE IN Red Oxide, Plastic or Paper Base
CRESTWOOD RECORDER DIVISION Daystrom Electric Corp. 837 Main St., Poughkeepsie, N. Y.	 <p>"Crestwood" Model 303 With Standard Microphone \$199.50 With Dynamic Microphone \$229.50</p>	50-10,000 cycles (± 2 db) at 7 1/2"/sec.	Portable, dual-track recorder with 7 1/2" and 3 3/4" tape speeds. Takes up to 7" reels. Fast forward and rewind, 20:1 ratio. Power output, 10 watts. Distortion, not over 3% at 5 watts output. Wow and flutter, not over 0.3% at 7 1/2"/sec. Provision for head alignment. Inputs for microphone, radio-phonograph. Outputs for external speaker and headphone monitor. Touch controls for microphone or radio, record or play, bass response, treble response. Coin slot speed change control. Two-neon-lamp volume indicator. Weight—22 lb.	Wound with OXIDE IN Red Oxide, Plastic or Paper Base
DuKANE CORPORATION St. Charles, Ill.	 <p>DuKane "True-Fidelity" Recorder Model 11A75 \$299.50 DuKane "Automatic" Model 11A140 \$387.50</p>	50-10,000 cycles ($\pm 1 1/2$ db) at 7 1/2"/sec. 50-7,500 cycles ($\pm 1 1/2$ db) at 3 3/4" sec.	Portable, dual-track, dual-speed recorder with 7 1/2 watt power output. Signal-to-noise ratio, 50 db on playback, distortion less than 5% at full output. Rewind time, 80 seconds for 7" reel. Fast forward, 100 seconds for 7" reel. Output for auxiliary speaker, monitor headphone and for feeding to input of another recorder for direct tape copying. Inputs for microphone, phonograph, radio. Electronic eye recording level indicator and automatic footage counter. Weight—39 lb.	Wound with OXIDE IN Red Oxide, Plastic Base

Manufacturer	Model and Price	Frequency Response	Data	Tape
ECTRO INC. Delaware 1, Ohio	 <p>"Cub Corder" Battery Operated Portable \$295.00</p>	200-6,000 cycles at 7 1/2"/sec.	Completely self-contained, battery operated portable tape recorder weighing less than 13 lb. complete. Dual track and single track recording—full track erase. Tape speeds 1 7/8" and 3 3/4", 3 3/4" and 7 1/2", 7 1/2" and 15" per second. Fast forward and rewind. Power supply, 1 rechargeable storage battery and 1 dry battery. Playback through microphone, headphones or external amplifier. Size, 12 1/4" x 13 1/4" x 5 5/8". Radio wireless Playback Unit (\$14.85 additional) permits playback through any car or home radio without attachment of wires.	Wound with OXIDE IN Red Oxide, Plastic Base
EDUCATIONAL LABORATORIES INC. 1625 Conn. Ave., Washington 9, D. C.	 <p>"Educcorder Dual" Model M-3 \$343.00</p>	50-8,000 cycles at 7 1/2"/sec. 50-5,000 cycles at 3 3/4"/sec.	Portable two speed tape recorder with two separate channels, each having its own amplifier and record, playback and erase heads. Can record on one channel while listening on other or can record or playback on both simultaneously. Provision for recording control signal on second channel and for connecting Tape Film Sync. Unit S-2 to provide automatic strip film or slide projector operation. Fast forward and rewind. Flutter under 1%. Three outputs: Channel 1, Channel 2, and "Dual" for split headphones. Weight, 24 lb. Dimensions, 17" x 13" x 10".	Wound with OXIDE OUT Red Oxide, Plastic or Paper Base
	 <p>"Educcorder" Portable Audio-Visual Laboratory Model PL \$495.00 Complete</p>	50-8,000 cycles at 7 1/2"/sec. 50-5,000 cycles at 3 3/4"/sec.	Consists of the Educcorder Dual M-3 (above) plus a matching accessories case which includes PS-43 Automatic strip film projector, S-2 Tape-Film Sync. Unit, Crystal Microphone, High Fidelity Crystal Split Headphones, Sync. signal recording push button, interconnecting cables and storage space for strip films and 10 reels of tape. Provides facilities for completely unattended audio-visual presentations for classroom and field training or for hobbyists. Alternate automatic strip film or 2 x 2 slide projectors available.	Red Oxide, Plastic or Paper Base
EICOR, INC. 1501 West Congress St., Chicago 7, Ill.	 <p>Eicor Model 400 \$119.50</p>	70-5,000 cycles at 3 3/4"/sec.	Portable, single-speed recorder (3 3/4"/sec.) with either single or dual track heads. Records up to 2 hours on 7" reel. Rewind speed, 6:1 ratio. 5 tube amplifier. Plug-in heads easily interchanged. Automatic retractable rubber pressure roller. Includes high impedance crystal microphone. Weight, 25 lb. complete.	Wound with OXIDE IN Red or Black Oxide Plastic or Paper Base
	 <p>Eicor Model 230 \$169.95</p>	70-7,500 cycles at 7 1/2"/sec. 70-4,000 cycles at 3 3/4"/sec.	Portable dual-speed recorder with interchangeable plug-in heads for single or dual track. Compensating switch equalizes amplifier for both 3 3/4" and 7 1/2" speeds. Records up to 2 hours on 7" reel. Rewind speed, 6:1 ratio. 5 tube amplifier. Automatic retractable rubber pressure roller. Red and green indicator lights for record and playback. Weight, 28 lb. complete.	Red or Black Oxide Plastic or Paper Base
ELECTRONIC TEACHING LABORATORIES 1818 M Street, Northwest, Washington 6, D. C.	 <p>"Electro-Dual" Binaural Tape Recorder-Reproducer \$495.00</p>	to 5,000 cycles at 3 3/4"/sec.	Dual, parallel tracks with separate heads and amplifiers. Professional type adjustable head azimuth alignment—broadcast quality heads. Two recorders in one but with only four electronic controls. Teaching applications: Student auditions permanent teaching material on Channel 1 while recording responses on Channel 2. Playback gives teacher's voice in one ear and student's voice in other. Instructor may monitor through extra jacks. Features: Illuminated Record/Play level meter in each amplifier. Miniaturized new design amplifiers—easy maintenance. Entire assembly removable and operable on its sturdy top plate. Full width erasure and dual speed optional for commercial use. Weight—29 lb.	Wound with OXIDE IN Red or Black Oxide Plastic or Paper Base

Manufacturer	Model and Price	Frequency Response	Data	Tape
FAIRCHILD RECORDING EQUIPMENT CORP. 154th St. and 7th Ave., Whitestone 57, N. Y.	 <p>Console Model Unit 126 \$2,750.00</p>	<p>50-15,000 cycles (± 1 db) at 15"/sec.</p>	<p>Professional type, single-track recorder with 15" tape speed (7 1/2" and 30" models available). Total noise and distortion -64 db (ref. 2 1/2% dist.). Adjustable bias. Speed tolerance, 0.1%. Built-in VU meter and circuit checking. Unit-type, plug-in chassis. Automatic stop — instant braking and reversal. Full protection against accidental erase.</p>	
	 <p>Console Model "PIC-SYNC" \$4,000.00</p>	<p>50-15,000 cycles (± 1 db) at 15"/sec.</p>	<p>Same as model 126 with the addition of lip synchronous operation. Used with motion picture camera and film projector, synchronous sound tracks are made and played back on 1/4" tape, with no interconnecting equipment. Automatic Framing, which assures correct cueing of tape and film, available at additional cost. Other applications include Facsimile recording, multi-track, and telemetering, with frequency response to 100 KC.</p>	<p>Wound with OXIDE IN Red Oxide, Plastic Base</p>
	 <p>Control Track Generator Model 141 \$200.00</p>		<p>Portable light weight unit for "On Location" picture synchronous sound track recording on 1/4" tape. Used with any portable tape recorder with 15"/sec. tape speed and frequency response good to 14 KC, a control track is simultaneously applied which later becomes the tape speed control when played back on Pic-Sync recorder.</p>	
FEDERAL MANUFACTURING & ENGINEERING CORP. 199-217 Steuben St., Brooklyn 5, N. Y.	 <p>FME Portable \$139.95</p>	<p>50-12,000 cycles (± 3 db) at 7 1/2"/sec. 50-7,000 cycles (± 3 db) at 3 3/4"/sec.</p>	<p>Portable dual-track recorder with tape speeds of 7 1/2" and 3 3/4" per second. Signal-to-noise ratio, 45 db below rated output. Single knob control for recording and playback functions with push buttons for record lock and fast forward. Variable volume and tone controls. Input for microphone or radio-phonograph for external speaker. Includes microphone and built-in playback speaker. Weight—25 lb.</p>	<p>Wound with OXIDE IN Red Oxide, Plastic or Paper Base</p>
THE GENERAL INDUSTRIES COMPANY Elyria, Ohio	<p>Tape Disc Recorder Assembly Model 250 \$79.50</p> 	<p>(depends on amplifier used)</p>	<p>Combined disc and tape recorder assembly for installation in console or portable case. Tape speed, 3 3/4"/sec., dual track. Fast forward and reverse. PM erase. Takes 5" reels. Disc recorder cuts and plays back up to 10" discs, at 78 rpm. Records from tape to disc and vice versa — and from microphone or radio to disc or tape.</p>	<p>Wound with OXIDE IN Red or Black Oxide Plastic or Paper Base</p>
INTERNATIONAL RADIO AND ELECTRONICS CORP. Elkhart, Ind.	 <p>"CROWN" Portable \$249.50</p>	<p>50-7,000 cycles (± 3 db) at 7 1/2"/sec.</p>	<p>Portable, dual-speed recorder with 40 watt output — operates two 25-watt speakers. Speeds, 3 3/4" and 7 1/2" per second with instantaneous speed change. Fast forward, 1200 ft. in 1 1/2 min. Rewind, 1200 ft. in 1 1/4 min. Output to total noise and hum level, 52 db. Flutter and wow, less than 0.4%. Distortion less than 4% at 36 watts. Two microphone inputs, four output jacks. Separate volume control for monitor and PA output. Weight—36 lb.</p>	<p>Wound with OXIDE IN Red Oxide, Plastic or Paper Base</p>
MAGNETIC RECORDING INDUSTRIES LTD. 30 Broad St., New York 4, N. Y. <i>(Continued on next page)</i>	<p>"Voice-Master" Magnetic Disc Dictating Machine \$175.00</p> 	<p>Voice Frequency Only</p>	<p>Portable magnetic-disc dictating and transcribing machine using mailable and re-usable paper discs with magnetic oxide coating. "Correct-O-Matic" feature erases previous dictation while recording changes or corrections. Visual record-listen indicator. "Split-A-Word" instant start and stop control. "Codit" scrambler available for confidential dictation, making recording unintelligible unless transcribed on machine with identical coding unit. Complete line of dictation and transcription accessories available. Price listed does not include microphone. Weight—11 lb.</p>	<p>Uses Special Paper Base Magnetic Discs</p>

Manufacturer	Model and Price	Frequency Response	Data	Tape
MAGNETIC RECORDING INDUSTRIES LTD. 30 Broad St., New York 4, N. Y.	"Synchronone" Dual Magnetic Recorder  Model VM-58 \$439.00	to 7,000 cycles at 7 1/2" /sec.	Portable tape recorder with two separate recording and reproducing channels. Permits synchronous recording or playback of two different events, synchronous playback of one event and simultaneous recording of another, or simultaneous two-channel recording or playback of same event for binaural effect. Independent control of record, erase and playback on each channel. Two inputs per channel. Fast forward and rewind, 75" per sec. Wow and flutter, less than 0.3% RMS. Weight—26 lb.	Wound with OXIDE IN Red Oxide, Plastic or Paper Base
	Model PT6-J Amplifier \$260.00  Model PT6-AH Recorder \$330.00 	50-15,000 cycles (±2 db) at 15" /sec.	Portable single-track, professional type recorder with interchangeable capstans for 15 and 7 1/2" tape speeds. Also available with dual-track heads and with dual speed motors for three speed operation. Fast forward and rewind speeds. Two separate heads. Combination record/playback amplifier. Flutter, 0.3% max. Low impedance mike input, bridging input, monitor speaker, O-level output terminal, VU meter, terminal for external speaker.	
	PT63-J Amplifier \$395.00  PT63-AH Recorder \$365.00 	50-15,000 cycles (±2 db) at 15" /sec.	Same as above, except with three separate heads for erase, record, and playback for monitoring from tape while recording. PT63-J amplifier has separate record and playback amplifiers, and switch for equalization at 7 1/2 and 15" tape speed.	
MAGNECORD INC. 225 W. Ohio St., Chicago 10, Ill.	Binaural Amplifier Model PT6-BN \$515.00  Binaural Recorder Model PT6-BAH \$390.00 	50-15,000 cycles (±2 db) at 15" /sec.	Portable dual channel recorder designed for binaural recording and reproduction (using simultaneous inputs from two microphones and outputs to two speakers or binaural headphones). Separate record/playback head for each channel—also separate gain controls and VU meters. Signal-to-noise ratio, 47 db per channel. Flutter, 0.3% max. Fast forward and rewind speeds. Includes speaker for monitoring either channel. Binaural conversion equipment available for use with existing Magnecord machines.	Wound with OXIDE IN
	 "Magne-Cordette" Model PT6-GAH \$425.00  "Magne-Cordette" Portable Model PT6-GAHP \$499.50	50-15,000 cycles (±3 db) at 15" /sec. 50-7,000 cycles (±3 db) at 7 1/2" /sec.	PT6-AH Magne recorder and "custom" amplifier mounted in attractive blonde or mahogany cabinet. Amplifier unit serves as recording amplifier and playback pre-amplifier for use with separate high fidelity or radio amplifier. Can be supplied with single or dual track heads. Tape speeds of 15" or 7 1/2" per second with interchangeable capstan. Three-speed units also available. Fast forward and rewind. Flutter, 0.3% max. Inputs for microphone and radio-phonograph. Combines PT6-AH recorder mechanism and "custom" amplifier as above with separate PT6-K amplifier-speaker combination. All amplifier controls and connections are on front of unit. Maximum power output, 10 watts. Output impedance, 4, 8 or 16 ohms. May be used as PA unit with microphone, radio, phonograph or other source.	Red Oxide, Plastic Base
	Model M-80-AC \$1,295.00  Model M-80-ACC \$1,345.00 	30-15,000 cycles (±3 db) at 15" /sec. 50-14,000 cycles (±3 db) at 7 1/2" /sec.	Professional type dual-speed recorder-amplifier combination available for portable, console or rack mounting. Features include: slot tape threading; push button and full remote controls; timing accuracy of ± 3 seconds in 30 minutes; new low-distortion amplifier, over 58 db signal-to-noise. Flutter less than 0.1% RMS at 15" /sec. Single or dual track. Microphone and bridging inputs. Metering switch measures bias, record level and reproduce level on one illuminated VU meter. Weight—50 lb. for mechanical unit, 14 1/2 lb. for amplifier. Console unit has tip-out panels for easy servicing.	

Manufacturer	Model and Price	Frequency Response	Data	Tape
MARK SIMPSON MFG. CO. INC. 32-28 49th St., Long Island City 3, N. Y.	 <p>"MASCO" Model 53 \$250.00</p> <p>Model 53R (with radio) \$290.00</p>	<p>80-8,500 cycles (± 3 db) at $7\frac{1}{2}$" /sec.</p> <p>80-5,000 cycles (± 3 db) at $3\frac{3}{4}$" /sec.</p>	<p>Portable dual-track, two speed recorder with 5 watts power output. Push button for instant speed change with automatic equalization. Separate take-up and drive motors. Flutter and wow, 0.3%. Monitoring switch for headphone, internal or external speaker. Inputs for microphone and radio-phonograph. Outputs for external amplifier, speaker or telephone line. Motor switch separate from amplifier. Weight, 40 lb. without radio—43 lb. with radio. Records from radio to tape without external connections.</p>	<p>Wound with OXIDE IN</p> <p>Red Oxide, Plastic Base</p>
THE PENTRON CORP. Factory: 221 E. Cullerton St. Chicago 16, Ill. Sales Office: 664 N. Michigan Avenue, Chicago 11, Ill.	<p>Portable Model 9T3-C \$179.50</p> 	<p>50-8,000 cycles at $7\frac{1}{2}$" /sec.</p> <p>50-5,000 cycles at $3\frac{3}{4}$" /sec.</p>	<p>Portable, dual-track, dual-speed unit ($7\frac{1}{2}$" and $3\frac{3}{4}$")—providing 2 hours recording on 7" reel. Signal-to-noise ratio, 50 db. Flutter less than 0.5%. Fast forward and rewind ratio, 20 to 1. Inputs for microphone and radio-phonograph. Outputs for headphones, external speaker, and PA system. Includes 6" PM speaker and crystal microphone. Weight—27 lb. Also available with single-track heads.</p>	<p>Wound with OXIDE IN</p> <p>Red Oxide, Plastic or Paper Base</p>
	<p>Pentron Tape Player</p>  <p>Model PB-A2</p> <p>\$119.50</p>	<p>50-8,000 cycles at $7\frac{1}{2}$" /sec.</p> <p>50-5,000 cycles at $3\frac{3}{4}$" /sec.</p>	<p>Portable magnetic tape reproducer, for playback only of any standard $\frac{1}{4}$" tape recorded with dual track at $7\frac{1}{2}$" or $3\frac{3}{4}$" per second (single-track heads available at slightly higher cost). Flutter less than 0.5%. Fast forward and rewind speed, 20 to 1.</p> <p>Complete with amplifier and speaker. Weight—22 lb.</p>	
	<p>Portable HI-FI Model PMC</p> <p>\$114.50</p>  <p>2-Speed Tape Mechanism Model 9T-3M</p> <p>\$59.75</p>  <p>Matching Pre-Amplifier Model PRE-7</p> <p>\$39.75</p>	<p>50-11,500 cycles (± 3 db) at $7\frac{1}{2}$" /sec.</p> <p>50-6,500 cycles (± 3 db) at $3\frac{3}{4}$" /sec.</p>	<p>Single or dual-track recorder consisting of Model 9T-3M tape mechanism and matching PRE-7 preamplifier, available in single portable case, or separately for custom installation. Takes reels to 7". Adapter for $10\frac{1}{2}$" reels available. Push-pull speed change. Separate record and erase heads have removable pole pieces for easy replacement or change from single to dual track recording. Flutter, 0.3% at $7\frac{1}{2}$" /sec. Signal-to-noise ratio, 47 db. "Magic-Eye" record level indicator. Inputs for microphone, radio, phonograph. Outputs for audio amplifier, headphones. Operates vertically or horizontally.</p>	
PREMIER ELECTRONIC LABORATORIES 382 Lafayette St., New York 3, N. Y.	 <p>"TAPESONIC"</p> <p>Model 70-A</p> <p>\$248.50</p>	<p>50-15,000 cycles at 15" /sec.</p> <p>50-12,000 cycles at $7\frac{1}{2}$" /sec.</p>	<p>Portable, professional type, dual track recorder with 4" VU meter. Three separate heads, permitting monitoring from the tape while recording. Tape speeds 15" and $7\frac{1}{2}$" per second. Flutter and wow 0.1% at 15" per second. Mixing channels for mike, radio or phone inputs. Three heavy duty dynamically balanced motors. Fast forward and rewind, less than 1 min. for 2500 ft. Electro dynamic brake action and tape tension. Push pull 12 watts audio output.</p>	<p>Wound with OXIDE IN</p> <p>Red Oxide, Plastic Base</p>

Manufacturer	Model and Price	Frequency Response	Data	Tape
PRESTO RECORDING CORP. P. O. Box 500, Paramus, N. J.	 <p>Model RC-7 Recording Mechanism \$425.00</p>  <p>Model RA-1 10 1/2" Reel Adapter \$39.00</p> <p>Model A-920 Amplifier \$324.00</p>	<p>50-15,000 cycles at 15"/sec.</p> <p>50-10,000 cycles at 7 1/2"/sec.</p>	<p>Professional type equipment for portable or stationary use. Tape transport mechanism has true three-motor drive and separate recording and reproducing heads. Instantaneous monitoring from tape is provided. Input for single microphone or high impedance bridging. Output, 10 watts. Also zero level line. Signal-to-noise ratio, 55db. Two speakers are mounted in amplifier for playback. Monitoring output for phones.</p>	
	 <p>Model RC-11 Recording Mechanism \$775.00</p>	<p>50-15,000 cycles at 15"/sec.</p> <p>50-10,000 cycles at 7 1/2"/sec.</p>	<p>Professional type, dual-speed tape recording mechanism, for rack, console or portable mounting. Takes reels up to 10 1/2". Tape speeds of 15" and 7 1/2" per second, with dual speed capstan motor. Signal-to-noise ratio, 55 db. Flutter, 0.15% at 15"/sec., 0.25% at 7 1/2"/sec. Brakes and capstan pressure pulley are solenoid operated, permitting complete remote control. Fast forward and rewind speeds adjustable by rheostat. Simplified direct threading path and enclosed head assembly.</p>	<p>Wound with OXIDE IN</p> <p>Red Oxide, Plastic or Paper Base</p>
	 <p>Model PB-17 Tape Reproducing Mechanism \$596.00</p>	<p>50-15,000 cycles at 15"/sec.</p> <p>50-10,000 cycles at 7 1/2"/sec.</p> <p>50-8,000 cycles at 3 3/4"/sec.</p>	<p>Long-play tape reproducing unit for wired music systems in industrial plants, amusement parks, skating rinks, etc. Normal tape speed, 3 3/4" per second — 7 1/2" and 15" speeds also available. Dual track heads with automatic reverse. Accommodates reels up to 14", with total playing cycle of up to 8 hours. At end of this time, mechanism can be made to recycle or stop.</p>	
	 <p>Console Model SR-950 \$2,785.00</p>	<p>50-15,000 cycles (±1 db) at 15"/sec.</p>	<p>Professional, single-channel recorder, with 15 and 7 1/2" tape speeds (15" and 30" optional). Signal-to-noise ratio, over 58 db below max. signal. Fast forward and reverse. 240 ft./sec. Three separate heads. VU meter. Amplifier and power supply units on hinged panel.</p>	
	 <p>Tape Drive Model TL-10 for 7 1/2" or 15" tape speed \$132.50</p> <p>for 7 1/2" and 15" tape speeds \$140.00</p>	<p>50-15,000 cycles at 15"/sec.</p> <p>— subject to limitations of amplifier used</p>	<p>Compact tape transport mechanism and reproducer, arranged to be mounted on and driven from any standard 16-inch turntable. Does not include provision for erase or recording. Equalized output of playback head may be fed directly into standard speech input equipment. Accommodates standard 7-inch reels. Tape speeds indicated are based on turntable speed of 78 rpm.</p>	
 <p>RAC Push- Button Recorder</p> <p>Model SRT-301</p> <p>(Price On Request)</p>	<p>70-7,500 cycles at 7 1/2"/sec.</p> <p>70-4,000 cycles at 3 3/4"/sec.</p>	<p>Portable dual-track, dual-speed recorder with push-button control for all functions—record, playback, stop, fast forward, fast rewind. Signal-to-noise ratio, 35 db. Simplified, straight-line threading. Double neon recording volume indicator. Instant speed change. Outputs for external amplifier, external speaker. Inputs for microphone, radio-phono, PA "take-off". Includes microphone and built-in speaker. Weight, 26 lb.</p>	<p>Wound with OXIDE IN</p> <p>Red Oxide, Plastic Base</p>	

(Continued on next page)

Manufacturer	Model and Price	Frequency Response	Data	Tape
RADIO CORPORATION OF AMERICA RCA Victor Division Camden 2, N. J.	 <p>Model RT-11B Cabinet Rack Mounted \$1,975.00</p>	<p>50-15,000 cycles (± 2 db) at 15"/sec.</p> <p>50-10,000 cycles (± 2 db) at 7 1/2"/sec.</p>	<p>Professional type, dual-speed tape recording equipment available in cabinet rack or console mounting. Three separate heads, with automatic tape lift on fast forward or rewind. Automatic "tape break" stop. Local or remote push-button control of all functions. Signal-to-noise ratio: 60 db at 15"/sec., 55 db at 7 1/2"/sec. Wow and flutter combined; 0.1% RMS at 15"/sec. 0.2% at 7 1/2"/sec. Distortion, 3% total RMS harmonic at 400 cycles, reference recording level. Timing accuracy: ± 5 seconds in 30 min. (machine to machine), $\pm 2 1/2$ seconds in 30 min. when played back on same machine at same temperature and humidity. Capstan is synchronous. Start and stop, 0.1 second. Rewind speed, 1 min. for 10 1/2" reel.</p>	<p>Wound with OXIDE IN</p> <p>Red Oxide, Plastic Base</p>
	 <p>Model RT-12B Console Mounted \$2,130.00</p>			
RANGERTONE INC. 73 Winthrop St., Newark 4, N. J.	 <p>"Rangerette" Portable Model A-2 \$1,500.00 complete</p>	<p>45-15,000 cycles (± 2 db) at 15"/sec.</p> <p>50-8,000 cycles (± 2 db) at 7 1/2"/sec.</p>	<p>Professional-type, single-track, dual-speed recorders, with choice of 3 3/4", 7 1/2", 15" or 30" per second tape speeds. Up to 2 hours recording at 7 1/2" per sec. on 14" reel. Distortion, less than 2% total harmonic. Maximum signal-to-tape noise, 55 db. Double-puck, tight-loop tape drive. Peak-to-peak flutter, less than 0.1% at 15"/sec. Rewind speed controllable continuously from 0 to 250"/sec. in both forward and rewind. Meets all N.A.B. adopted standards. Complete monitoring and mixing facilities. VU meter, signal indicator and footage counter calibrated in minutes and seconds. Complete tape editing facilities. Also available with positive "sprocketless" synchronization for motion picture and TV applications. Weight of Rangerette — 30 lb.</p>	<p>Wound with OXIDE IN</p> <p>Red or Black Oxide, Plastic Base</p>
	 <p>Console Model R-5C with synchronizer (Price on Request)</p>	<p>45-15,000 cycles (± 2 db) at 15"/sec.</p> <p>50-8,000 cycles (± 2 db) at 7 1/2"/sec.</p>		
REVERE CAMERA CO. 320 East 21st St., Chicago 16, Ill.	 <p>Model T-700 2 hour play \$225.00 Model TR-800 2 hour play (with radio) \$277.50</p> <p>Model T-10 1 hour play \$235.00 Model TR-20 1 hour play (with radio) \$287.50</p>	<p>80-8,000 cycles (± 3 db) at 3 3/4" /sec.</p> <p>60-15,000 cycles (± 3 db) at 7 1/2" /sec.</p>	<p>Portable dual-track recorder available in either 3 3/4" or 7 1/2" per second tape speed. Signal-to-noise ratio, over 50 db at either speed. Distortion less than 1%. Rewind and fast forward speed, 170" per second. Flutter less than 0.3%. Solenoid operated. Two neon lamps for more accurate level setting. Can be operated as a P.A. 6" x 9" Alnico V speaker. Weight—30 lb.</p>	<p>Wound with OXIDE IN</p> <p>Red or Black Oxide, Plastic or Paper Base</p>

Manufacturer	Model and Price	Frequency Response	Data	Tape
<p>RECORDERS DISTRIBUTORS</p> <p>7122 Melrose Ave., Hollywood 46, Cal.</p>	 <p>"Port-Able" Tape Reporter</p> <p>\$250.00</p>	<p>depends on playback equipment</p>	<p>Completely self-contained, mechanically driven, battery operated portable tape recording unit. Eight min. operation on one winding of motor. Can be wound while recording. Single, three-way control switch. Operates at 7½" per second, single-track recording. Arranged for bulk erase only. Includes provision for monitoring through crystal headphone. Weight, 11 lb. complete. Also available in deluxe model with built-in output amplifier and loudspeaker for on-the-spot listening.</p>	<p>Wound with OXIDE IN</p> <p>Red Oxide, Plastic or Paper Base</p>
<p>SCRIBE CORPORATION</p> <p>2835 N. Kedzie Ave., Chicago 18, Ill.</p>	 <p>Permoflux Scribe Dictating Unit</p> <p>\$354.50</p>	<p>Ample for all voice recording</p>	<p>Compact magnetic tape recorder designed for varied business purposes. Same recorder, with different accessories, serves as either a dictating or transcribing unit. Dictating unit includes microphone with control switch. Transcribing unit includes single earphone and dual foot control. Simple "cartridge" loading eliminates threading. Tape speed, 3¼" per sec. Recording time, ½ hour per magazine. Includes provision for card indexing of corrections, extra carbons, length, rush, etc. Available accessories include: carrying case, telephone pick-up, magazine packet, tape mailing envelopes, dual foot control, single or double earphones, paddle-type or conference "mike," microphone adapter, external speaker and extra tape magazines.</p>	<p>Wound with OXIDE IN</p> <p>Red Oxide, Paper or Plastic Base</p>
 <p>Permoflux Scribe Transcribing Unit</p> <p>\$361.30</p>				
<p>SPEAK-O-PHONE RECORDING AND EQUIPMENT CO.</p> <p>23 West 60th St., New York 23, N. Y.</p>	 <p>Speak-O-Phone "Superior" Tape-Disc Recorder Model TD52</p> <p>\$299.50</p>	<p>Amplifier Response, 60-8,000 cycles per sec.</p>	<p>Portable combination tape and disc recorder, with 3¾" tape speed (dual tract) and 78 rpm turntable (12" capacity). Records from microphone or radio to tape or disc, from disc to tape or from tape to disc. Plays back from tape or disc. Accommodates 5" tape reels. Fast forward and reverse tape speeds. Includes crystal microphone and 5" x 7" speaker. Weight—30 lb.</p>	<p>Wound with OXIDE IN</p> <p>Red Oxide, Plastic Base</p>
<p>THE STANCIL-HOFFMAN CORP.</p> <p>921 North Highland Ave., Hollywood 38, Cal.</p>	 <p>"Minitape" Model M5A</p> <p>\$249.00</p>	<p>100-5,500 cycles (±2 db) at 7½" or 15"</p> <p>100-4,000 cycles (±2 db) at 3¾"/sec.</p>	<p>Portable, single-track recorder with tape speeds of 3¾, 7½ and 15" per sec. Signal-to-noise ratio, at least 35 db. Completely self-contained battery operated unit (recording only). Weight—13 lb.</p>	<p>Wound with OXIDE IN</p>
	<p>Model R-5 \$1,575.00</p> 	<p>50-15,000 cycles (±1 db) at 15"/sec.</p>	<p>Portable, professional-type, single-track recorder with tape speeds of 7½ and 15" (or 3¾ and 7½") per sec. Signal-to-noise ratio, over 60 db. Separate record and playback heads and amplifiers with independent monitor amplifier and speaker.</p>	<p>Red Oxide, Plastic Base</p>
	<p>Model S5 Synchronous Magnetic Film Recorder \$2,142.00</p> 	<p>45-7,500 cycles (±2 db) 16mm</p> <p>45-15,000 cycles (±2 db) 17½mm</p>	<p>Synchronous magnetic film equipment for motion picture and TV sound recording. Includes proper speed and equalization for both 16mm and 17.5mm film width. Full synchronous sprocket drive arranged for forward or reverse recording or playback. Also fast forward and reverse for editing. Gearless drive. Signal-to-noise, at least 50 db. Max harmonic distortion, 1.5% from full level. Playing time, up to 1 hr. for 16 mm, up to 24 min. for 17.5mm. 2,000-ft. reel capacity.</p>	<p>Uses Magnetically Coated 16mm and 17.5mm Film</p>

(Continued on next page)

Manufacturer	Model and Price	Frequency Response	Data	Tape
THE STANCIL-HOFFMAN CORP. 921 North Highland Ave., Hollywood 38, Cal.	 <p style="text-align: center;">Model CRM-15 Multi-Channel Communications Recorder</p> <p style="text-align: center;">(Prices on Request)</p>	<p style="text-align: center;">200-7,500 cycles (±3 db) at 7½"/sec.</p> <p style="text-align: center;">200-3,500 cycles (±3 db) at 3¾"/sec.</p>	<p>Provides up to 15 simultaneous recording channels on 0.7" wide tape. Recording time, up to 4½ hours for 5,000 foot reel. Two units, with automatic sequence control permit continuous, 24-hour recording. Signal-to-noise, at least 40 db. Distortion, not more than 5% total harmonic at "0" input level. Negligible crosstalk between channels. Push-button control. Fast forward and rewind. Automatic stop.</p>	<p style="text-align: center;">Uses Special 0.7" Plastic or Paper Base Tape</p>
TAPE MASTER, INC. 13 W. Hubbard Street, Chicago 10, Ill.	 <p style="text-align: center;">Tape Master Model PT-150</p> <p style="text-align: center;">\$179.50</p>	<p style="text-align: center;">50-8,000 cycles (±3 db) at 7½"/sec.</p> <p style="text-align: center;">50-5,000 cycles (±3 db) at 3¾"/sec.</p>	<p>Portable, dual-speed, dual-track recorder operating at 7½" and 3¾" per second. Single-knob instant speed change. Signal-to-noise ratio, 45 db. Maximum flutter, 0.5% at 7½"/sec. Fast forward and rewind speed, 20:1 ratio. Maximum speed variation, 2%. Harmonic distortion at normal max. output, 3%. Inputs for microphone, radio-phon. Outputs for audio amplifier and headphone. Neon record-level indicator. Includes microphone, speaker, 5" reel of tape and 7" take-up reel. Weight, 23 lb.</p>	<p style="text-align: center;">Wound with OXIDE IN</p>
	 <p style="text-align: center;">Tape Master Model H.F. 500</p> <p style="text-align: center;">\$279.50</p>	<p style="text-align: center;">30-15,000 cycles at 7½"/sec.</p>	<p>Portable, single-speed recorder. Signal-to-noise ratio, 50 db or more. Wow and flutter, 0.3% maximum. Illuminated VU meter for record and playback level. Separate speaker volume control for monitoring while recording. Separate recording and playback amplifier stages. Power output 2 watts, 4½ peak. High and low level inputs and 600 ohm output. Six-stage all-triode preamplifier with separate gain control. Six-inch speaker included.</p>	<p style="text-align: center;">Red Oxide, Plastic or Paper Base</p>
TELECTRO INDUSTRIES CORP. 35-16 37th St., Long Island City 1, N. Y.	 <p style="text-align: center;">Telectro Portable Model TR-175</p> <p style="text-align: center;">\$750.00</p>	<p style="text-align: center;">50-9,000 cycles at 7½"/sec.</p> <p style="text-align: center;">50-5,000 cycles at 3¾"/sec.</p>	<p>Portable, dual track, dual speed unit operating at 7½ and 3¾ in. per second. Signal-to-noise ratio, better than 45 db. Flutter less than 0.5%. Separate mike and telephone line inputs. Provision for control by microphone pushbutton, foot pedal forward and backspace, and automatic voice operation. Precise counter index for accurate spacing. Built-in PA amplifier with separate control, and 6" PM speaker with external speaker connection. Ruggedized for military service. Weight—43 lb.</p>	<p style="text-align: center;">Wound with OXIDE IN</p>
	 <p style="text-align: center;">"Telectro- tape" Portable</p> <p style="text-align: center;">\$75.00</p>	<p style="text-align: center;">flat to about 6,500 cycles at 3¾"/sec.</p>	<p>Light-weight, dual-track recorder with 3¾" tape speed. Handles up to 5" reels, providing up to 1 hour recording time. Wow and flutter, approximately 0.5%. High impedance microphone input may also be used for radio input. Extremely simple threading and operation. Neon bulb recording level indicator. Weight, less than 14 lb. Supplied complete with crystal microphone, built-in speaker, 5" reel of tape and take-up reel.</p>	<p style="text-align: center;">Red Oxide, Plastic or Paper Base</p>
WEBSTER CHICAGO CORPORATION 5610 Bloomingdale Ave., Chicago 39, Ill.	 <p style="text-align: center;">Web-Cor Portable Model 2010</p> <p style="text-align: center;">\$207.50</p>	<p style="text-align: center;">70-7,500 cycles at 7½"/sec.</p> <p style="text-align: center;">70-4,000 cycles at 3¾"/sec.</p>	<p>Portable, dual-track recorder with tape speeds of 3¾" and 7½" per sec. Gives up to 2 hours recording on 7" reel. Records or plays in both directions without reel turnover. Fast forward and rewind. Two recording heads and two motors. Signal-to-noise, 35 db. Amplifier automatically equalized for both speeds. Includes electronic eye volume level indicator, 6" PM speaker and microphone. Input for microphone or radio-phon. Output for external speaker, amplifier or PA system. Weight—38 lb.</p>	<p style="text-align: center;">Wound with OXIDE IN</p> <p style="text-align: center;">Red or Black Oxide, Plastic Base</p>

Manufacturer	Model and Price	Frequency Response	Data	Tape
WEBSTER ELECTRIC CO. Racine, Wisc.	 <p>"Ekotape" Model 205 \$225.00</p>	<p>50-8,000 cycles at 7 1/2" /sec. 50-5,000 cycles at 3 3/4" /sec.</p>	<p>Portable, dual-track, dual-speed recorder with instant speed change and automatic equalization. Fast forward 15:1 ratio. Rewind 15:1 at 7 1/2" /sec. or 30:1 at 3 3/4" /sec. Power output, 2 1/2 watts at 5% distortion, 400 cycles. Socket for plugging in remote manual or foot control switch. Built-in 5" x 7" PM speaker. Inputs for microphone and radio-phonograph. Output for external speaker. Neon record-level indicator. Weight, 28 lb. Includes microphone, reel of tape and take-up reel.</p>	<p>Wound with OXIDE IN</p> <p>Red or Black Oxide, Plastic or Paper Base</p>
	 <p>"Ekotape" Portable Model 101-8 \$385.50 Model 101-9 \$412.50</p>	<p>40-10,000 cycles at 7 1/2" /sec.</p>	<p>Portable, single-track recorder with 7 1/2" tape speed. Fast forward and rewind, 7 1/2" per sec. Electronic eye recording level indicator. Inputs for microphone and radio-phonograph. Output for external speaker. Includes 8" PM speaker. Weight—50 lb. Model 101-8 includes crystal microphone. Model 101-9 includes receptacle for connecting a remote control foot switch.</p>	
WILCOX-GAY CORP. 70 Washington St., Brooklyn 1, N. Y.	 <p>"Tape Recordio" Model 3A10 7 1/2" and 3 3/4" /sec.) Model 3A11 (3 3/4" and 1 7/8" /sec.) \$159.95</p>	<p>75-10,000 cycles (±3 db) at 7 1/2" /sec. 80-6,000 cycles (±3 db) at 3 3/4" /sec. 100-5,000 cycles (±3 db) at 1 7/8" /sec.</p>	<p>Portable, dual-track tape recorders with tape speeds of 7 1/2 and 3 3/4 in. per second or 3 3/4 and 1 7/8 in. per second. Signal-to-noise: 55 db for 3A10, 45 db for 3A11. Neon normal and overload record level indicators. Inputs for microphone and radio-phonograph-TV. Jack for external speaker. Fast forward and rewind. Keyboard control of all recording functions. Includes microphone and built-in speaker. Weight—23 lb.</p>	<p>Wound with OXIDE IN</p> <p>Red Oxide, Plastic or Paper Base</p>
	 <p>"Tape Recordio" Model 3F10 \$179.95</p>	<p>55-10,500 cycles (±3 db) at 7 1/2" /sec. 75-7,500 cycles (±3 db) at 3 3/4" /sec.</p>	<p>Portable, dual-track, dual-speed tape recorder, operating at 7 1/2" and 3 3/4" per second. Signal-to-noise, 57 db. Balanced push-pull circuit. Other features, controls and facilities similar to 3A10 described above. Also includes compartment in case for storing extra tape reels and connecting cord. Weight—25 lb.</p>	
	 <p>"Tape-Disc Recordio" Model 3C10 \$199.95</p>	<p>80-6,000 cycles (±3 db) at 3 3/4" /sec.</p>	<p>Portable combination tape and disc recording and reproducing unit, with tape speed of 3 3/4" per second (dual track) and 78 rpm disc speed. Signal-to-noise, 45 db. Transfers recordings from tape to disc or vice-versa. Jack for external speaker. Neon normal and overload recording level indicators. Fast forward and rewind speeds. Includes microphone and built-in speaker. Weight—30 lb.</p>	
	 <p>"Recordio Grand" Model 3F40 (Mahogany) \$289.50 Model 3F41 (Limed Oak) \$299.50</p>	<p>55-10,500 cycles (±3 db) at 7 1/2" /sec. 75-7,500 cycles (±3 db) at 3 3/4" /sec.</p>	<p>Console, dual-track, dual-speed tape recorder, operating at 7 1/2" and 3 3/4" per second. Signal-to-noise, 57 db. Balanced push-pull circuit. Neon normal and overload record indicators. Inputs for microphone and radio-phonograph-TV plus extra radio-phonograph-TV input jack at rear of cabinet. AC receptacle at rear for radio-phonograph plug-in. "Prest-O-Matic" push-button keyboard. Includes microphone and 12" bass reflex speaker unit with built-in tweeter. Side tape compartment holds 12 5" or 7" reels. Weight—64 lb.</p>	
WIREWAY CORPORATION OF AMERICA 440 W. Superior Chicago 10, Ill.	 <p>Wireway Portable Model 107 (Price on Request)</p>	<p>50-9,000 cycles at 7 1/2" /sec. 50-7,000 cycles at 3 3/4" /sec.</p>	<p>Portable dual-track recorder with 7 1/2" and 3 3/4" tape speed. Fast forward and rewind speed. Signal-to-noise ratio, 42 db. Flutter and wow ±1.1% RMS. Neon bulb recording level indicator. Power output, 2 watts. Includes microphone and built-in 5" x 7" PM speaker. Weight—21 lb.</p>	<p>Wound with OXIDE IN</p> <p>Red or Black Oxide, Plastic or Paper Base</p>

CONTEST WINNERS REAP THEIR REWARDS

Audio Devices' International Sound Recording Contest is past history now — at least as far as announcement of the winners is concerned. But the benefits thereof continue. Most important of these, from the contestants' point of view, was the awarding of the cash prizes which totalled

\$1400.00. Here we see the first prize winner and two of the second prize winners reaping their rewards.

To our readers, however, the benefits will continue for many months, as the prize-winning articles appear in *Audio Record*, bringing you important inside information on modern tape and disc recording methods and applications.



Bryce Haynes (left), Vice President of Audio Devices, Inc., presents a check for \$250.00 to the happy first prize winner, Henry M. Broderick, Jr., Chief Engineer of Station WDRC, Hartford, Conn. Mr. Broderick's prize-winning article appeared in the July-Aug. 1953 issue of *Audio Record*.

Jesse C. Durham, of Station WSB-TV, Atlanta, Ga., gets a \$100.00 hand shake from "Holly" Hollingsworth, of Hollingsworth and Still, Factory Representatives for Audio Devices, Inc. Mr. Durham's second prize winning article also appeared in the July-Aug. issue of *Audio Record*.



Brewster Freifeld (left), Manager of Audio Devices' newly opened Chicago Office, extends his congratulations (one hundred dollars worth) to another second prize winner — Mr. Bob Holben, of Station WMBD, Peoria, Ill.



Musical Experiments with Tape

(Continued from Page 4)

song "America" normally. The music was then scored backwards and played that way and we recorded it. We then reversed the tape and played it backwards so that the tune "America" was immediately recognized in its regular form, but with an astonishing difference. The instrument no longer sounded like a piano, but more like an organ because of the fact that by playing the tape backwards, the reverberation of the initial note struck on the piano, normally heard last, was now heard first, and the initial note, normally heard first, was now heard last. This reversal of the normal characteristic sound of the piano resulted in the smooth flowing sound of the organ.

The final portion of the program merely demonstrated how by varying the pitch of everyday sounds, results in the manufacture of sounds entirely different than the original. Of course this was accomplished by tape speed changes. As an example, the staccato rapidity and high pitch of a bicycle bell when reduced in speed sounds like a large fire bell with deep bass tones and slower succession of rings. The sound of a baby crying becoming the sobs of a grown woman. The deep tone of an ocean going liner transformed to the high pitch of a tug boat whistle.

Recording by tape and the flexibility of this medium is opening a fascinating field in the creation of sound not only in its original form, but an entirely new concept of sound for the purpose of special effects. Undoubtedly, tape recording is our greatest discovery in the world of sound.

About Our Back Cover

Some of our readers may be surprised to see an advertisement for *Audio Record* appearing on the back cover of *Audio Record*.

Ordinarily, this might look a little like "carrying coals to Newcastle". But this is no ordinary issue. The *TAPE RECORDER DIRECTORY ISSUE* of *Audio Record* goes to about 85,000 people. That's more than double our usual circulation. Hence, about 50,000 people who are not on the *Audio Record* mailing list will see this particular issue. It is to these people that the ad is addressed — as an invitation to join the rapidly growing list of regular *Audio Record* readers.

If you are not already on our mailing list, please read this ad carefully and see what you're missing. Then send us your name and address — along with the names and addresses of any of your friends who are interested in sound recording. That's all you have to do to start your *Audio Record* collection.

audio pointers for the Recordist

By C. J. LeBel, Vice President
Audio Devices, Inc.

RECORDER QUALITY CONTROL



C. J. LeBel

With the coming of September we mark the beginning of the Fall buying season by our annual tabulation of recorder data—and we reopen a question which has come up each year with increasing force. This is the matter of matching recorder performance against the manufacturer's claims, and the need it points up for better quality control. While quality control has always played an important part in the Audio factory, this article is not prompted by factory experience—rather it is induced by our voluminous correspondence with tape users. The problem seems most acute with home style machines, and particularly with those achieving wide frequency range at low tape speeds.

Unlike many home devices, the performance of a magnetic recorder can be measured quantitatively. The growth of the high-fidelity field has trained the ears of many users. Others have access to measuring equipment, and in some cases the recorder is purchased by a radio station with excellent test equipment. In more instances than one, such a test has led to an indignant letter, citing a machine which had an upper frequency limit of 5 kc, whereas the manufacturer's claim is 8 kc.

Now surprising as it may seem to some of our engineering readers, catalog sheets are not prepared by a sardonic gentleman wearing horns and a cloven hoof. The data they contain usually originated in the Engineering Department, but somewhere between the chief engineer and the printer certain facts are often forgotten:

1. Production units are seldom as carefully made as the engineering model.
2. Production units are unlikely to be as carefully checked as the production pilot model and the first hundred or two off the production line.

If catalog claims are based on solid fact, as is usual, then the reputation of the product is likely to depend inversely on the number of defective units which slip by production test. A simple listening test is not enough, for the inspector's ear can become fatigued. Professional recorders are inspected very completely by the manufacturer, for the user is equally critical. Some home machine makers need to realize that the home audio field is in many places at least half as critical as the professional. Every machine should be checked for the following:

- A. Gain—too low gain will enforce too short a distance between microphone and talent, with attendant loss of quality.
- B. Frequency response—the machine designed for wide frequency range at low tape speed is particularly sensitive to the quality of its reproducing head. We attribute many complaints to this.
- C. Distortion—here even the professional machine may be at fault. It has been customary to check machines for harmonic distortion only, at 400 cps. An intermodulation test, with frequencies less amiably disposed toward the machine (60 cps. and 7 kc) has been known to show surprising things, and to explain some puzzling complaints. Some manufacturers use no distortion test at all, and rely on a listening test.
- D. Signal to noise ratio—the signal to noise ratio of many home type machines is far too low already. If a machine normally has only 35 db and this is further reduced by a bad condenser, for example, the result is far more immediately apparent than a drop from 57 down to 52 db.

As an example of the benefits of quality control, we recall installing a quality control system in a hearing aid plant. When the system was first installed, it was found that the distortion was not statistically under control, with results similar to Fig. 1. This explained why so many instruments were being returned as unsaleable by dealers. After installation of a distortion meter the factory shut down while the product was improved! A week of intensive work pinpointed the trouble as an incorrect resistor. Production then had the characteristics of Fig. 2. Units with excessive distortion were rejected and reworked. After a year of this program sales were up 50%.

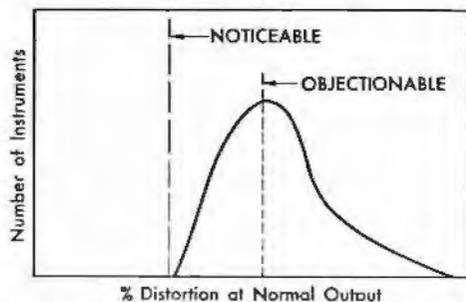


Fig. 1. Distortion in hearing aid production before quality control system went into operation.

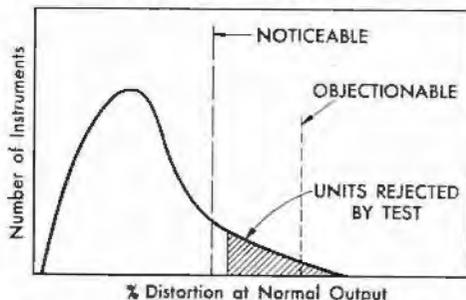


Fig. 2. Distortion in hearing aid production after several months of operation of a quality control system.

Audio Engineering Society Elects New Officers

The following officers of the Audio Engineering Society have been elected by mail balloting and will take office on Nov. 1, 1953.

President: Jerry B. Minter, Vice Pres., Measurements Corp., Boonton, N. J.

Executive Vice President: A. A. Pulley, Manager of Recording, RCA Victor Record Department, N. Y. C.

Central Vice President: Robert C. Moyer, Engineering Section, RCA Victor Record Department, Indianapolis, Ind.

Western Vice President: Boyd McKnight, North American Aviation, Inc., Los Angeles, Cal.

Secretary: C. J. LeBel, Vice President, Audio Devices, Inc., N. Y. C. (reelected)

Treasurer: R. A. Schlegel, Recording Supervisor, WOR Recording Studios, N. Y. C.

New Governors:

R. H. Ranger, President, Rangertone, Inc., Newark, N. J.

Lawrence J. Scully, Scully Machine Co., Bridgeport, Conn.

Walter O. Stanton, President, Pickering & Co., Oceanside, N. Y.

F. Sumner Hall, President, Audio Equipment Sales, Oceanside, N. Y.

Governors Continuing in Office:

Price E. Fisher, CBS, New York City

Jay H. Quinn, Fairchild Recording Equipment Co., Whitestone, N. Y.

C. R. Sawyer, Bell Telephone Laboratories, Whippany, N. J.

only



offers you all this
valuable new information

... and it doesn't cost you a cent!



20 PRIZE-WINNING ARTICLES from Audio's International Sound Recording Contest

Here's a wealth of new ideas on how to use tape and disc recordings to achieve greater economy and efficiency in radio, TV and sound studio operation.

With reference to these articles, one of the contest judges commented as follows: "I have never received so much information which was new and exciting in such a

short time in all of my years in the business." And another judge stated that "the information and descriptions of recording operations conducted in small radio stations and recording studios throughout the country has been quite an education."

Contest winners include entries from 11 different States, as well as from Canada

and Switzerland. The 20 best articles, which were awarded cash prizes totaling \$1400, will be published in the pages of Audio Record. The information thus made available to the industry will be of real value to sound recordists everywhere.

QUICK FACTS ON MAGNETIC TAPE RECORDERS

Each year, Audio Record brings you a complete, up-to-date listing of all makes and models of tape recording machines—with conveniently arranged price and performance data. This directory issue,

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... plus many other articles of timely
interest to the sound recordist

Audio Record keeps you well informed on all the latest trends and technical developments in all phases of tape and disc recording. It is not an advertising publication and its sole purpose is to render a needed and useful service to the industry.

Audio Record, published 8 times a year, is currently distributed free of charge to a request mailing list of about 35,000 sound recordists in broadcasting stations, recording studios, schools and colleges throughout the country.

IT'S YOURS FOR THE ASKING

A letter or post card will add your name to the Audio Record mailing list. And if you would like to have others in your organization read it also, send their names along, too. Just write to Audio Devices, Inc., using the Dept. No. listed below. All requests addressed to this Dept. will be started with the July-Aug., 1953 issue, so you will be sure to get *all* the prize-winning articles, as well as the 1953 Tape Recorder Directory Issue.

AUDIO DEVICES, Inc.

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