

Postwar Recorders Show New Ideas

MUCH interest and enthusiasm is being shown in the wire recorders which will be available for general use shortly. It is reasonable to assume that they will become necessary accessories for the home, shop and office.

Recent issues of *Radio-Craft* have discussed wire recording from amateur and professional points of view. The January, 1945, issue described the technique of a home-built outfit. In March, 1945, the theory and design of modern recorders was discussed. Here we are concerned with present and future uses of these instruments and offer a preview of models either already in production or in the development stage. The use of recorders will be as widespread and handy for preserving sound events as cameras are for scenes.

Many recent and basic discoveries in wire recording are due to Marvin Camras of Chicago, who first worked with recorders while he was still a student of electrical engineering at Illinois Institute of Technology. His original experiments were prompted by his cousin, who liked to sing, and his first crude models were built for the purpose of recording such vocal music. After graduation Camras joined the Armour Research Foundation as associate physicist, and his work was developed and perfected there. The Foundation is the non-profit research organization of Illinois Tech.

Briefly, a wire recording instrument uses a steel wire which moves past an intense magnetic field which is varied in accordance with the desired sounds. The wire then becomes permanently magnetized. If the wire is now passed through a coil (usually the recording head also serves as the reproducing head) a corresponding audio voltage will be induced in the coil. This voltage is amplified so that the original sound is reproduced.

By I. QUEEN

The high fidelity of which the modern recorder is capable is due to introduction of a super-sonic voltage which is superimposed over the recording frequencies. The resultant magnetic bias eliminates distortion which is present otherwise due to non-linear response at very low magnetizing force.

Wire recorders are serving with the Marine Corps, the Army and a number of government agencies. During the war they were used for transmission of instructions and observations which could not be trusted to radio, as well as for troop entertainment and boosting military morale. A standard type is seen below. Its characteristics are listed in Table A.

The U.S. Dept. of Agriculture is using wire recorders for a series of interviews at agricultural experiment stations, to be rebroadcast on several farm radio programs, thus eliminating the necessity of personal appearance of the speakers. The Library of Congress uses an experimental machine and is exploring the possibility of re-recording on wire from the present disc records of American folk-lore music. Both National political party conventions of 1944 were permanently recorded on wire.

Wire recorders will be manufactured and distributed by many nationally known radio companies which have obtained licenses from the Foundation for the manufacture and sale of instruments covered by its basic patents. Among them are:

- Scott Radio Laboratories
- Automatic Electric
- General Electric
- Radiotechnic Laboratories
- Raytheon
- Stromberg Carlson
- Utah Radio Products

and others pending. Evidently radio and recording will be closely linked. This is fitting, for many interesting radio programs will be recorded and stored for future playback. Since the same wire can be used



Artist's conception of post-war adaptor unit, designed to be attached to existing radio receivers.

over and over again, there is nothing lost by recording many programs and keeping only a treasured few.

The features of wire recording not possessed by other methods are listed in Table B.

MODERN RECORDER DESIGN

Wire recorders for home and office will tend towards compactness and ease of operation. Many medium-priced radio and television receivers will be equipped with this accessory. Other models, small enough to fit a woman's handbag are being planned. A few designs are illustrated here.

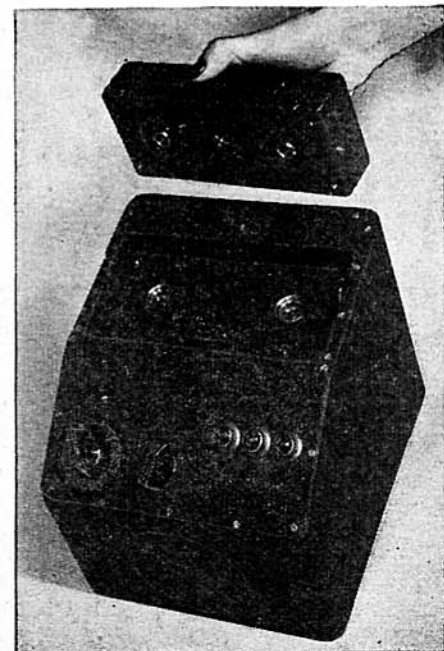
- Important uses will be:
- Home radio-television receivers;
 - Recording and playing amateur and professional records;
 - Speech and music training;
 - Educational purposes
 - Office and remote dictation;
 - Court reporting;
 - Police calls and reports;
 - Church and industrial music.

One typical model is to have the following specifications:

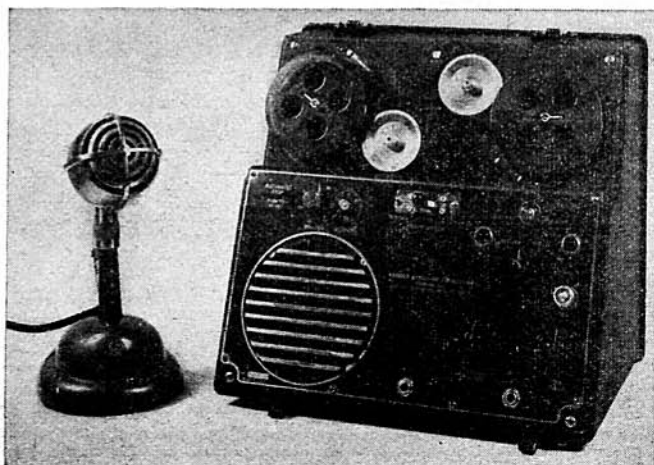
- Dimensions—7¾ x 4 x 1¾ inches;
- Wire on spool—½ lb. of .003" wire;
- Recording time—2¼ hours at 1¼ ft./sec;
- Weight—3 pounds.

This instrument will be completely self-

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The original Model 50 wire recorder, used extensively during the war, appears at the right. Its ruggedness gave it a marked advantage over less sturdy types of recorders. At left is a magazine model, with the magazine shown lifted just clear of the sockets into which it fits.



POSTWAR RECORDERS

(Continued from page 176)

contained, the only external connection being a small microphone which may be held in the hand, worn on a lapel, or clipped to the side of the recorder and carried a la handie-talkie.

TABLE A—SPECIFICATIONS OF MODEL 50

Specifications for Model which was manufactured for the armed services exclusively	
Dimensions	13" wide, 12½" high, 9½" deep
Weight	35 pounds, complete
Wire	11,500 ft. of .004" wire (½ lb.)
Recording time	66 mins. at 2½ ft./sec.—can be adapted for spools containing three times the length
Input A	high. imp. dynamic, ribbon, or crystal microphone
Input B	AM or FM tuner, phono, or 500 ohm, zero level line
Output	10 ohm
Monitor speaker	5" PM, self-contained, automatically cut out on inserting external plug
Tubes	five receiver-type
Background noises	40 DB below max. signal strength
Frequency response	flat from 200-3000 cycles per second. Can be adapted to respond from 75-10,000 c.p.s. where music is required
Power	40-60 watts

TABLE B—WIRE VS. OTHER RECORDING

ADVANTAGES OF SOUND-ON-WIRE

No needle scratch—low noise level
 No records to turn over
 Not affected by temperature changes
 Unaffected by vibration and shock
 Unlimited re-use of wire
 Instantaneous play-back—no processing
 Unlimited number of play-backs
 Long recording time
 Excellent fidelity
 Light, compact, portable
 Any portion can be erased

The Foundation is planning to introduce a master recorder and a multiple recorder, both now in the development stage. The first will have exceptionally high fidelity for recording professional productions. Duplicates of the master record will be made by the multiple recorder in large numbers faithfully and simultaneously for extensive consumer use and enjoyment. Credits for photos and drawings: Armour Research Foundation, Product Designers, Modern Plastics.



The pocket model's mechanism is very simple.

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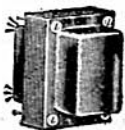


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