Western Electric Mirrophone

This page submitted by Steve Shepard who put this item up for auction on eBay.

Of all the strange things that have been manufactured by Western Electric, this extremely rare "**Mirrophone 213-A Reproducer Set**" has to be one of their most unusual. It's called a Mirrophone (that's the correct spelling). When I found this at a recent estate sale, I thought the label said "microphone", and assumed that it was some kind of public address amplifier. It's not. Instead, it's a one-minute continuous loop wire recorder/playback machine. It may have been used as a voice training instrument. It was made by Western Electric for its subsidiary, Electrical Research Products, Inc. (ERPI). Notes found with it indicate that it was made no later than 1944. I have no other documentation.

In operation, one plugs a microphone (not included) into the input jack on the front of the instrument and sets the controls to the "record" mode. The correct recording volume is set with the aid of the built in "magic eye" cathode ray indicator, which displays the amount of modulation present. A message of up to about a minute in duration may be recorded. After recording, the controls are switched to the playback mode and the message will be played back continuously, either through its internal speaker or to an external amplifier (not included). There is a motorized pointer, just below the Magic Eye, that rotates once per minute as the message is being recorded or played back. It indicates the time remaining/time elapsed of the message. .

There are many unusual and unique features of this device. As near as I can estimate, there is a seventy seven foot endless loop of metal recording wire, wound 28 times around the spools and wheels of its transport mechanism. The entire length passes over the unit's record/playback head once per minute. This works out to be pretty close to a wire speed of fifteen inches per second: The wire really flies around its circuitous path at a good clip. You may be familiar with wire recorders of the forties and fifties that preceded today's tape recorders. Those reel-to-reel recorders used wire that was round in cross section. In contrast, the Mirrophone's wire is flat, like the tape in a modern tape recorder. Its approximate dimensions are 0.05 inch wide by a few thousandths thick (maybe about 0.003 inch). I did not want to risk damaging the wire with a micrometer, so did not take an actual measurement. The recording and pickup heads are very primitive. They look very much like small solenoid coils.

Several features lead me to believe that this may have been a prototype or of very limited production. The entire cabinet is made of wood, except for the metal back panel. There is a brown wrinkle-finish paint applied to the sides and top, and gloss brown paint on the front panel, both of which give the impression of a metal cabinet. Also, if you look at the close-up pictures of the front panel controls, you will see position markers around the "Volume", "Repeat/Record", and "Timer" knobs. These are simply little brass round-head nails pressed into the wood. Surely a high-production machine would have been made differently. The low serial number (201) is another indication that there may not have been many units produced.

This is not a hi-fi however, and the sound quality is inferior by modern standards. The Magic Eye tube is bright and functions properly. I used a magnetic microphone to do my recording, but I believe that a ceramic type would work as well. I don't see why any other audio source could not be used as easily. The four tubes used are 6X5, 6V6GT, 6B8, made by RCA and Philco, and the 6E5 Cathode Ray Indicator, made by Emerson.

It still has a Railway Express shipping label attached, over which has been placed a shipping label from the Mountain States Telephone and Telegraph Company.

Uncrated, the Mirrophone weighs 60 pounds. It measures 15-1/2"H x 19"W x 13"D. The shipping/storage box weighs 35 pounds and measures 22"W x 22"W x 16-1/2"D

I received an email from Dave D. referencing a book that appears to exactly describe the Mirrophone. The book is *"Magnetic Recording"* by S.J. Begun (Vice President and Chief Engineer, the Brush Development Company), Rinehart and Company, NY, 1949. Here are some excerpts from page 159 of that book (there is also a schematic and a photo of the device)**:**

> "The Mirrophone... was manufactured by the Western Electric Company in the beginning of 1940 and was intended primarily as a voice-training device and for use in the telephone system for weather-announcing purposes.
> "The recording medium consisted of 0.050 inch wide Vicalloy tape in the form of an endless loop, supported on three rollers... The medium was wound over the three rollers in a manner somewhat similar to a reversible threaded screw so that no crossover path was necessary. A spring-biased pulley maintained the medium at constant tension. A belt drive was employed, driving one roller to propel the tape.
> "The recording time of this instrument was about 1 minute, and a time indicator on the front of the panel informed the user when to switch from recording to reproducing. Directcurrent bias was used. The instrument covered a frequency range of from 100 to 5,000 c.p.s. and had a dynamic range of about 40 dB."

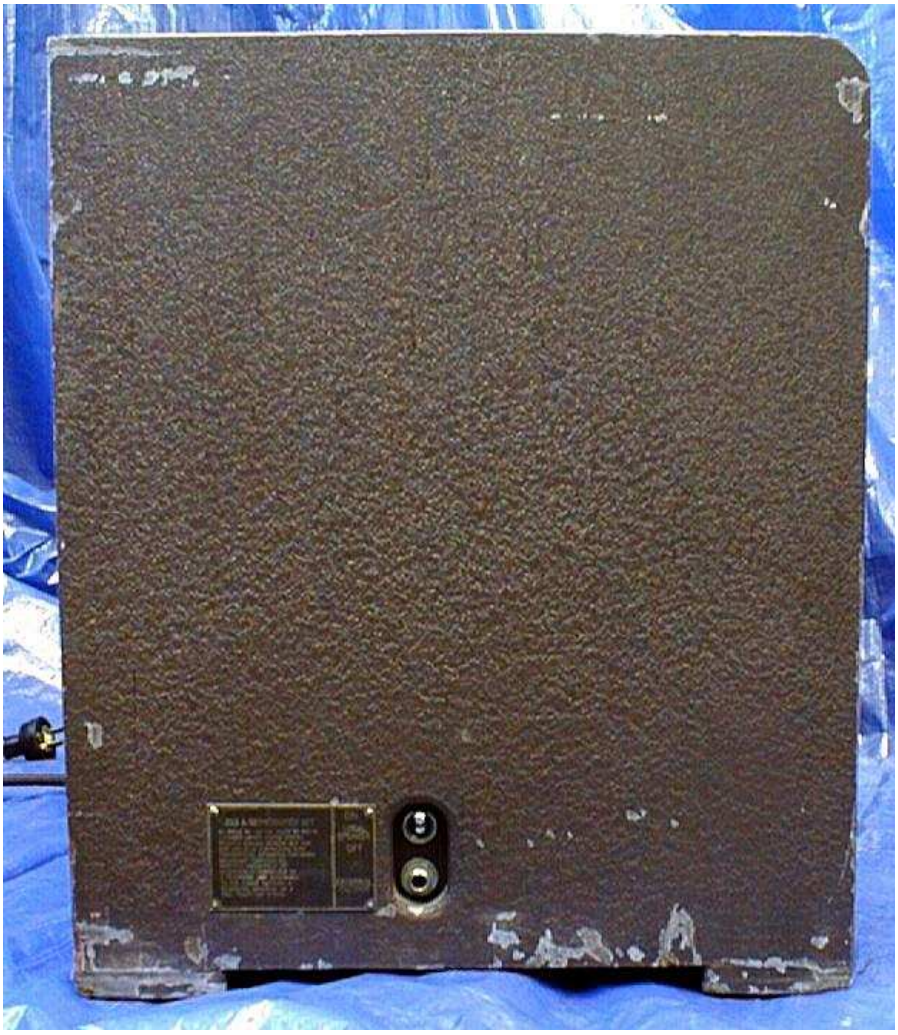
There is also a small, blurry photo and passing mention of the Mirrophone in Appendix A of "Magnetic Recording Handbook" by Marvin Camras (Van Nostrand Reinhold Co., 1988).

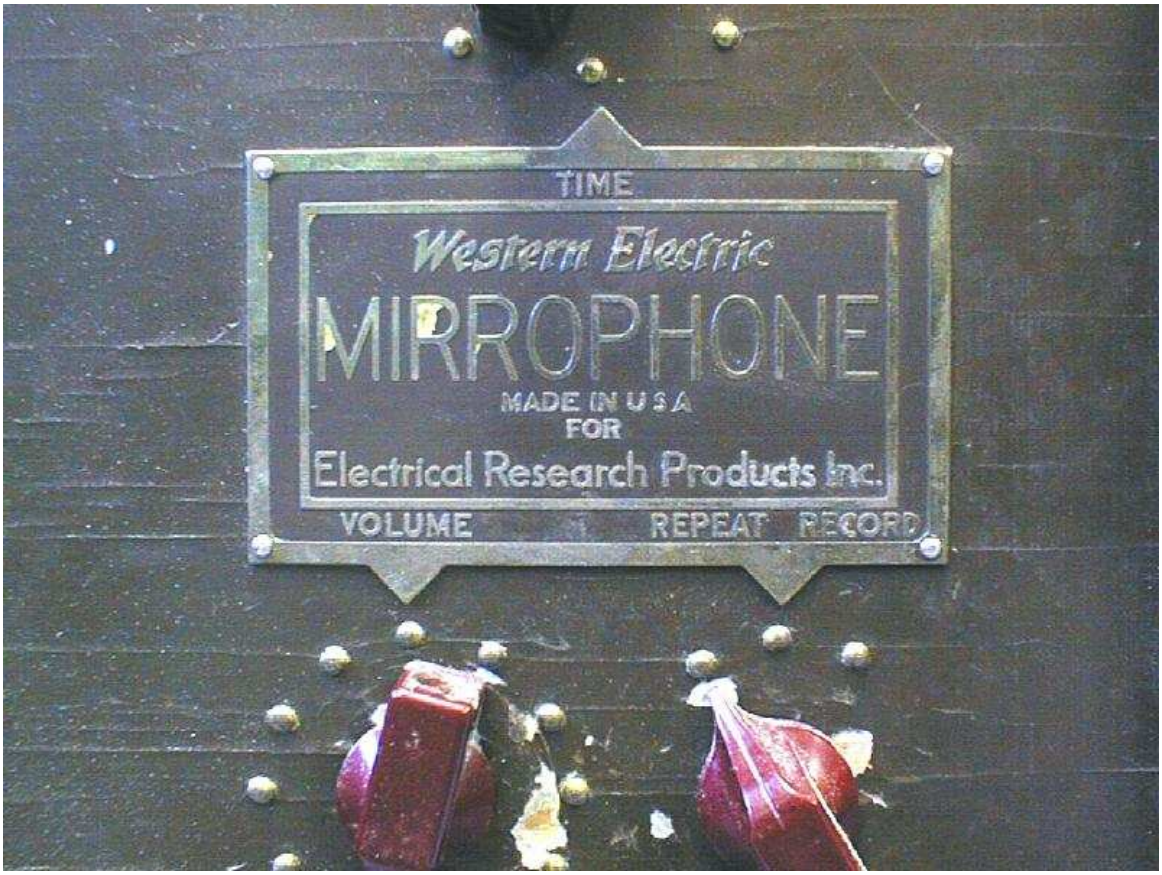
In addition, *"Wireless World"* magazine (February 1942) and "Radio Craft" (April,1942), both have almost identical 2-page articles about this machine.

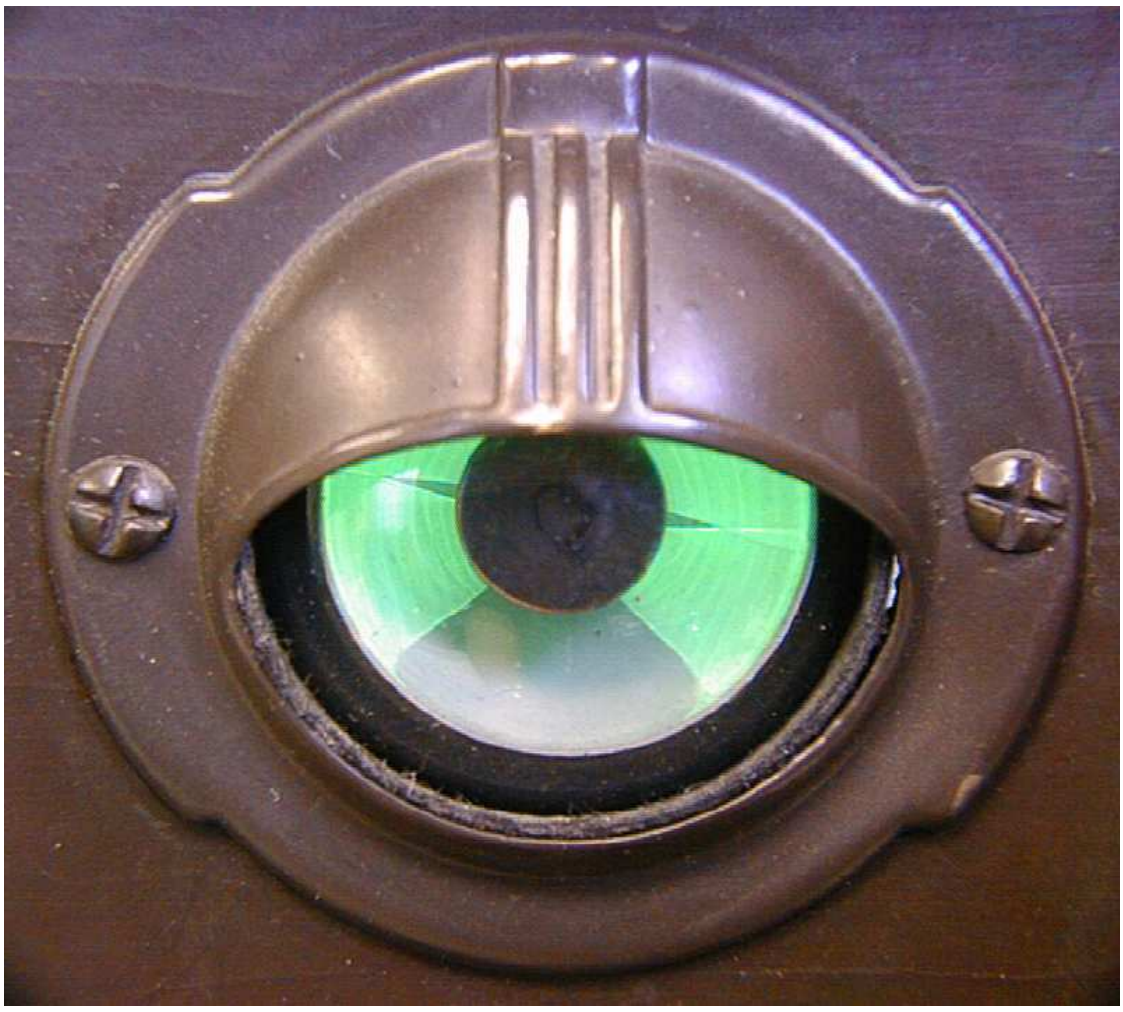
Note:
The above online article about the **Mirrophone** was copied from my ebay auction of ~2001. A representative from Bell Systems wrote and asked my permission to put the description and photos on their online museum, located at https://beatriceco.com/bti/porticus/bell/mirrorphone.html.

Due to a computer crash, I have since lost all of my original ebay documentation, so these photos and description are now the only record of the machine. I'm glad I gave them my OK to copy. Several paragraphs and a few photos were edited out for the online presentation, but the important points have been preserved.

Not included in the original description is information about **Vicalloy,** the material used for the magnetic ribbon wire. Vicalloy is a family of permanently magnetic alloys which consists of 52% cobalt, 10% vanadium, trace amounts of elements such as carbon and manganese, and balance (~37%) iron.




TIME
Western Electric
MIRROPHONE
MADE IN U.S.A.
FOR
Electrical Research Products Inc.
VOLUME
REPEAT
RECORD

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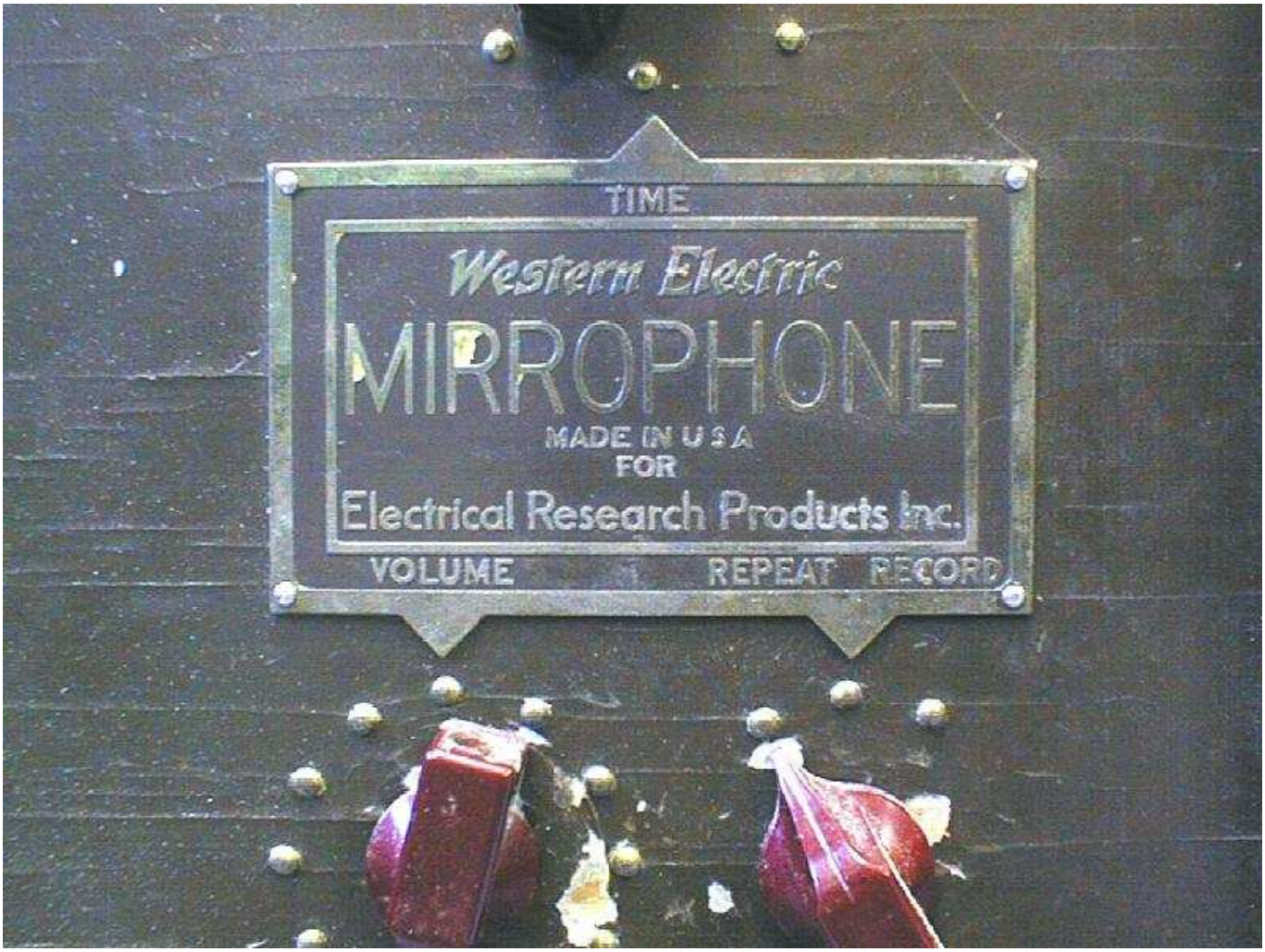
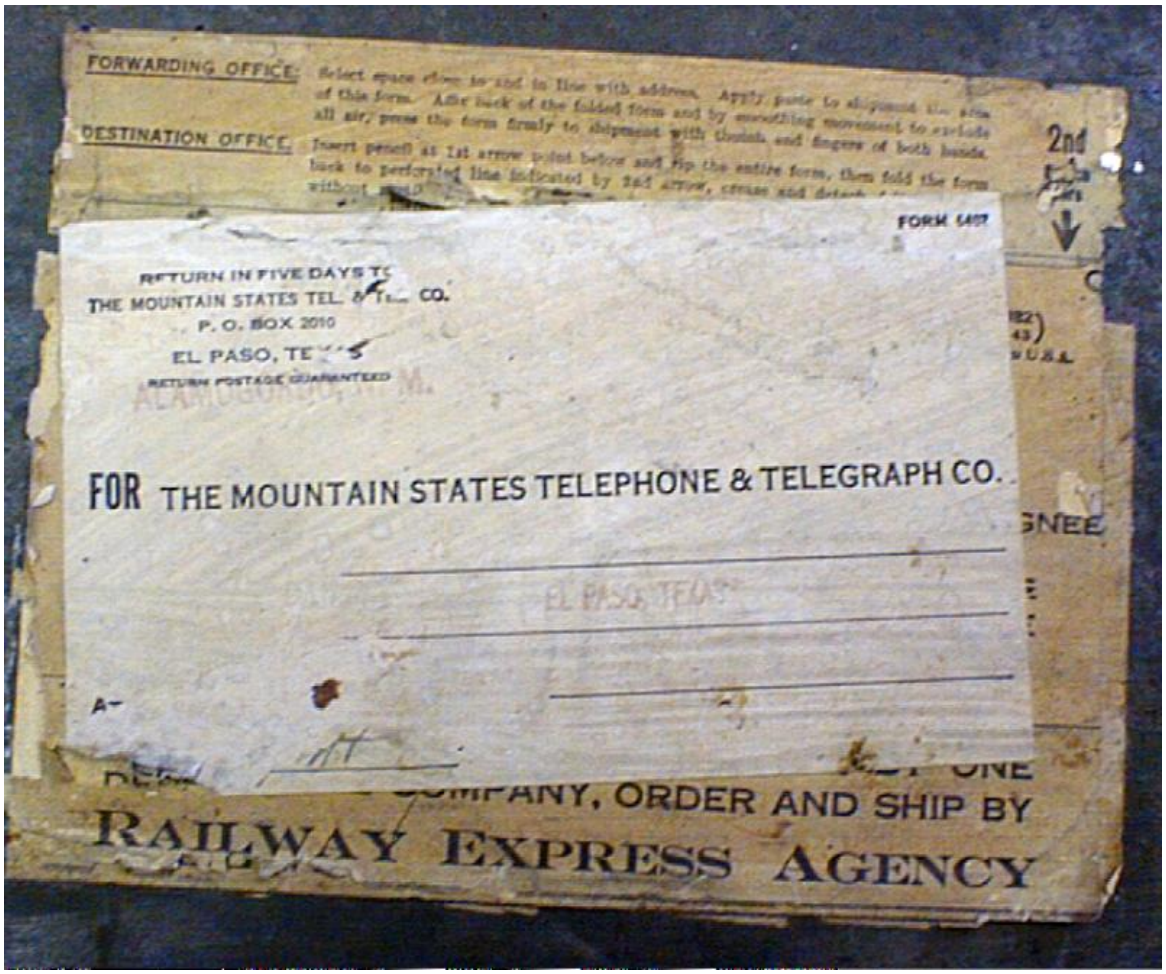
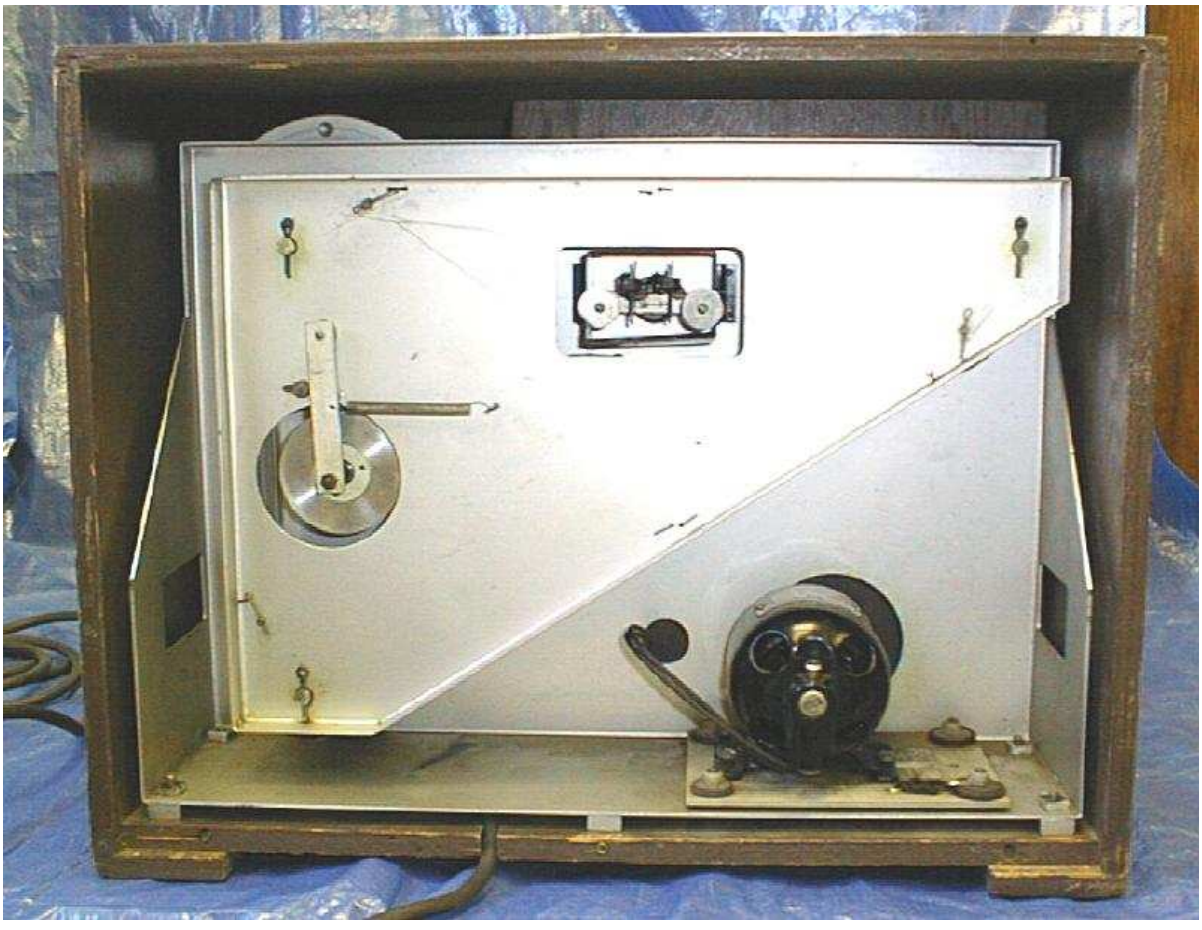
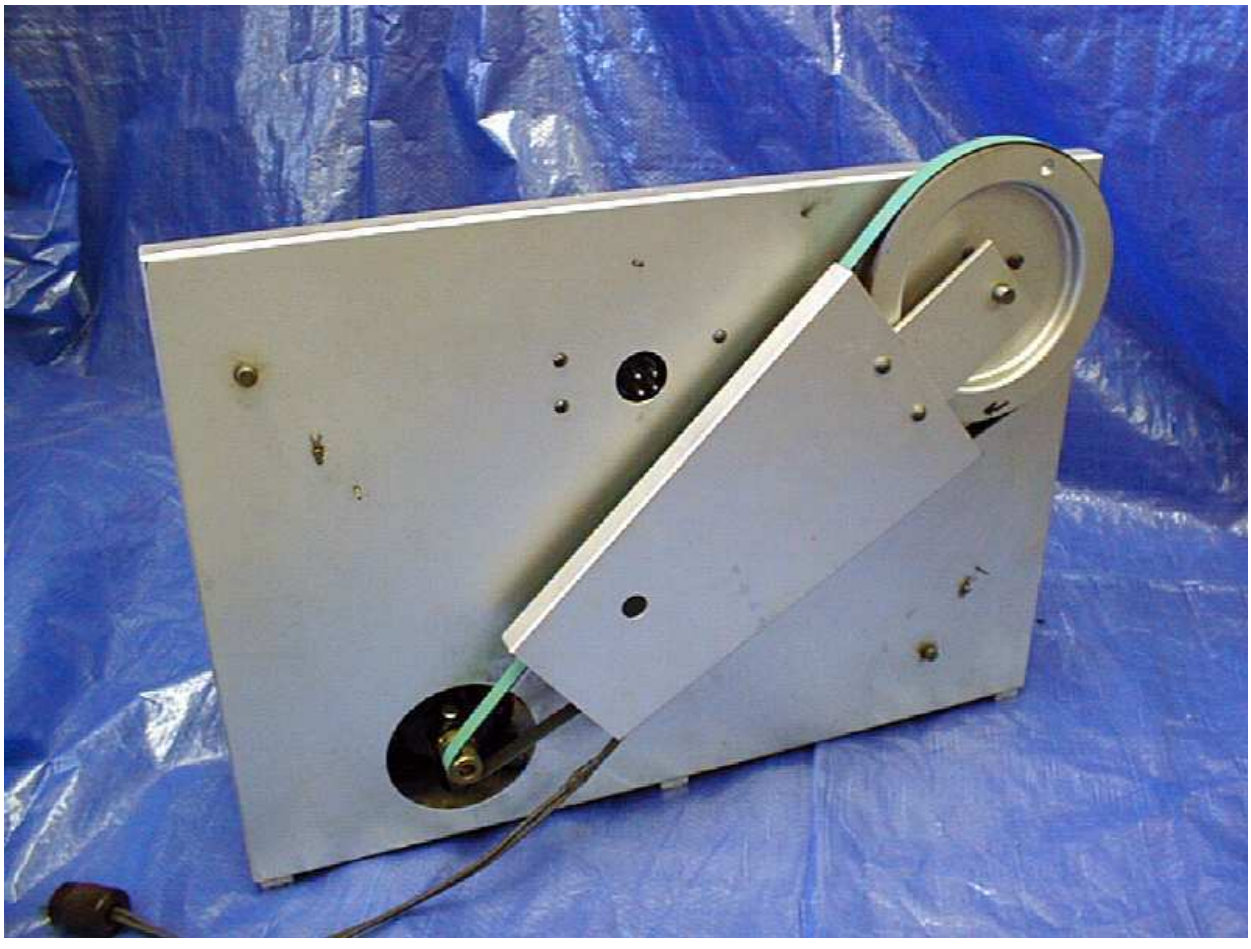
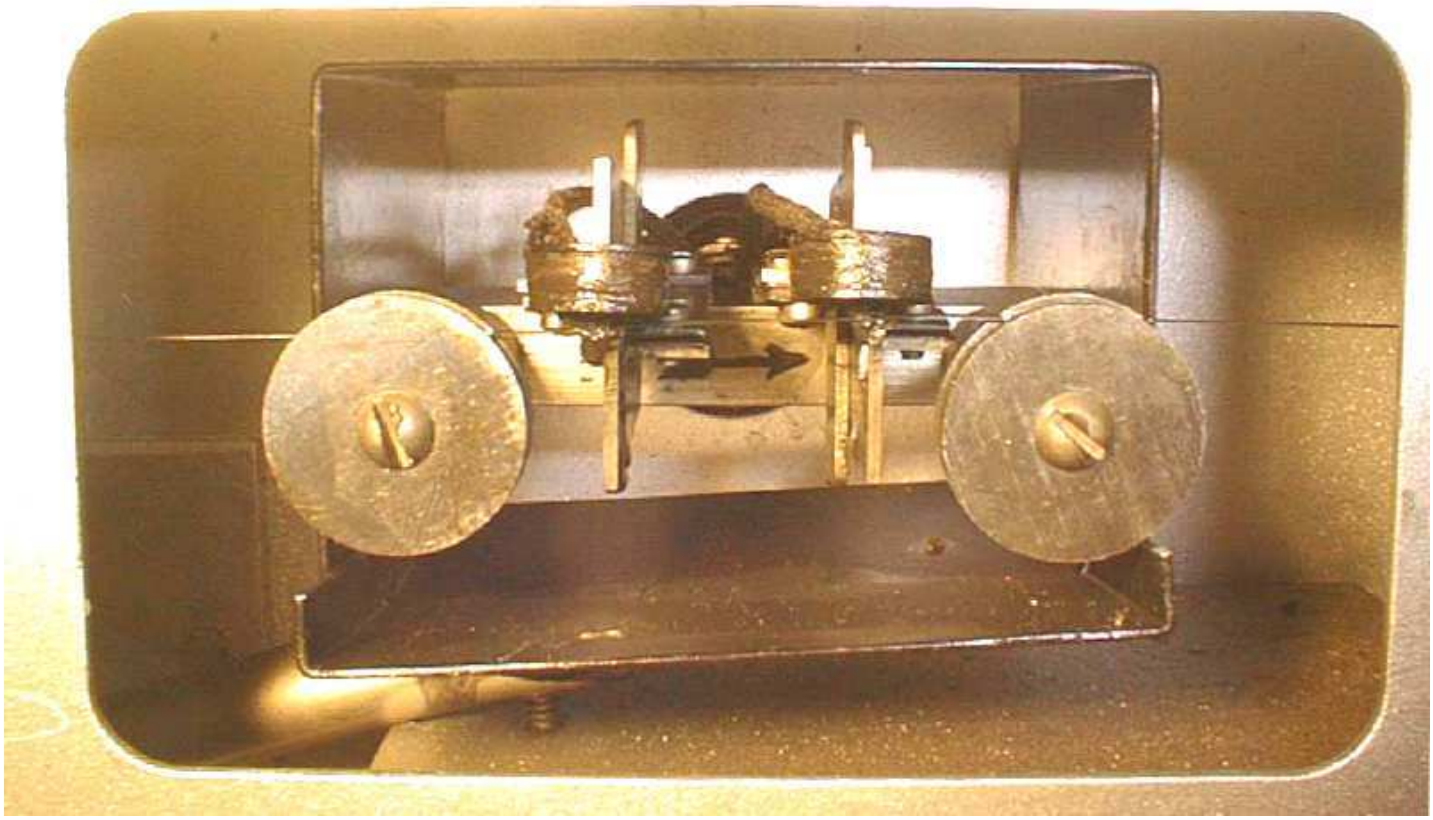

TIME
Western Electric
MIRROPHONE
MADE IN U S A
FOR
Electrical Research Products Inc.
VOLUME
REPEAT RECORD

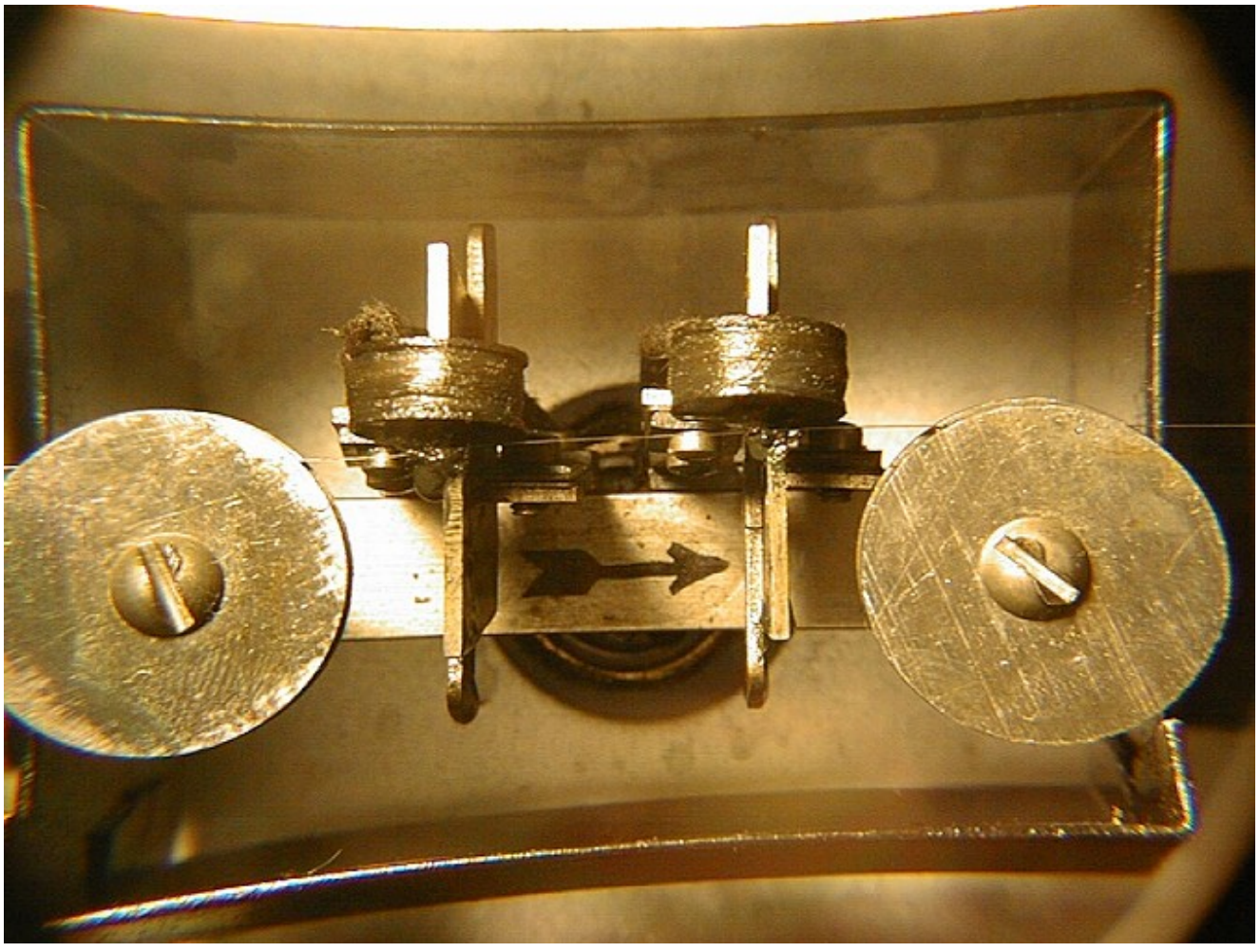

213 A REPRODUCER SET
60 CYCLE AC 110-120 VOLTS 90 WATTS
LICENSED UNDER UNITED STATES
PATENTS MARKED HEREON BUT NOT
FOR USE (A) IN CONNECTION WITH
TRANSMITTING APPARATUS FOR RADIO
BROADCAST PURPOSES; (B)
DIRECTLY, INDUCTIVELY OR
ACOUSTICALLY CONNECTED TO
A TELEPHONE LINE ACCESSIBLE
TO THE PUBLIC THROUGH A
TELEPHONE EXCHANGE OR A
TOLL TELEPHONE SYSTEM.
ON
LOCAL SPEAKER
OFF
EXTERNAL OUTPUT

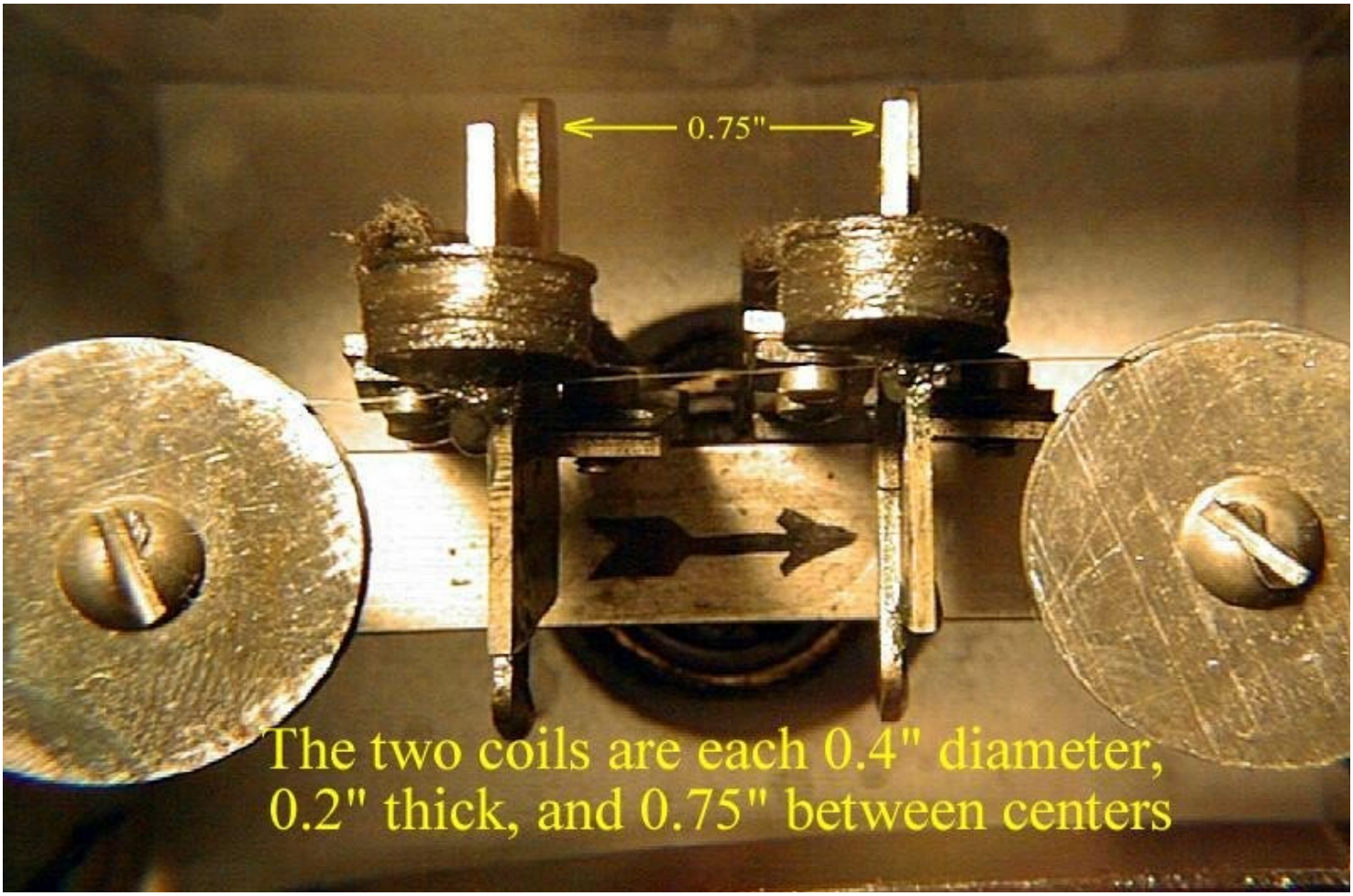

FORWARDING OFFICE:
DESTINATION OFFICE:
2nd
FORM 5407
RETURN IN FIVE DAYS TO
THE MOUNTAIN STATES TEL. & TEL. CO.
P. O. BOX 2010
EL PASO, TEXAS
RETURN POSTAGE GUARANTEED
FOR THE MOUNTAIN STATES TELEPHONE & TELEGRAPH CO.
EL PASO, TEXAS
COMPANY, ORDER AND SHIP BY
RAILWAY EXPRESS AGENCY










0.75"
The two coils are each 0.4" diameter,
0.2" thick, and 0.75" between centers