

# Indiana Historical Radio Society BULLETIN

Volume 13

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Number 2





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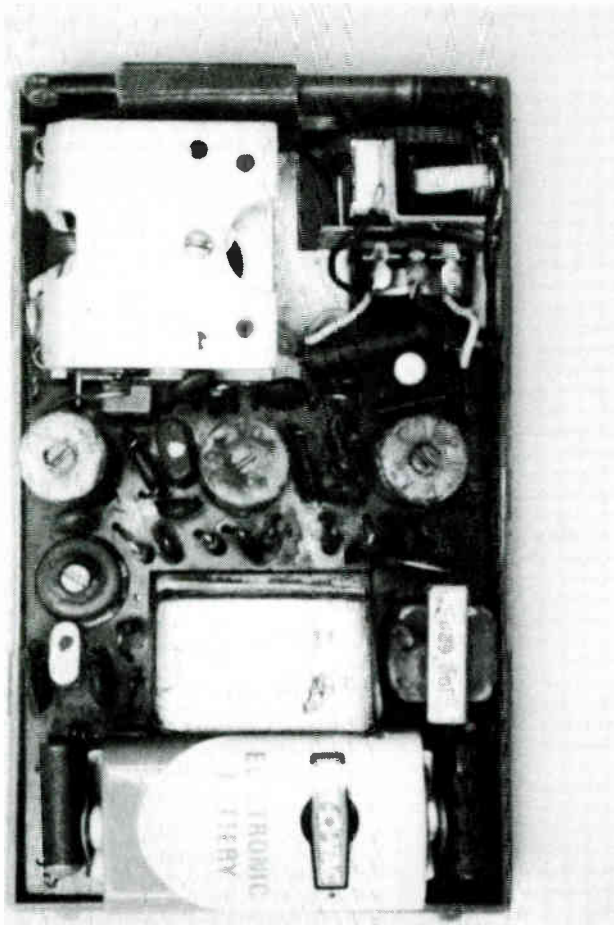
### FOR SOCIETY INFORMATION WRITE TO:

Vice President-For legal matters of the IHRS.  
Secretary-For general correspondance and membership applications.  
Treasurer-For membership payments and address changes. (1984 dues are \$6.00).  
Historian-For History of the IHRS and for donations of material for the scrapbook.

Please use a stamped, self-addressed envelope when requesting information.



The radio shown in this photo is the Regency model TR-1, the first all transistor radio made in 1954.



This photo shows the works of the radio inside the cabinet. Note the conventional tuning capacitor and the 22½ volt battery.

THE REGENCY TR-1  
ALL-TRANSISTOR RADIO

The following article is taken from an interview with Richard Koch of Regency Electronics on March 10, 1983.

Through cooperative efforts of Texas Instruments and Industrial Development Engineering Associates, the first all-transistor radio arrived on the market in time for the 1954 Christmas Season.

It was a true "pocket size" radio, measuring three inches wide, five inches long and only one and one-quarter inch thick, weighed 12 ounces and sold for \$49.95 on the retail market, less the 22½ volt hearing-aid battery.

Advertised as the World's Smallest and lightest weight radio, it did actually fit in the pocket of an Arrow shirt of the day, but not in the pocket of a discount store shirt. The plastic case was offered in six colors and a leather carrying case was optional for \$3.95. Another option was the Regency Earphone priced at \$7.50. The station selector dial was designed to be flush with the case and a small edgewise knob was provided for the volume control and battery switch.

Texas Instruments were ready for large-scale production of transistors in 1954 and considered building a radio for the market themselves. However, cost estimates of over \$100.00 retail price discouraged management and it was decided not to produce the set themselves. Industrial Development Engineering Associates (I.D.E.A.) Regency

Division entered the picture at this point in time. An aggressive company since it's founding in September of 1945, I.D.E.A. had the design and production capacity to handle the job of producing a transistor radio within a very short time period, with the resulting increase in sales for the Texas Instruments transistor market.

Richard Koch of I.D.E.A. and Roger Webster of Texas Instruments worked together, with their respective staffs, in matching the early transistors available to a practical circuit design, which later became the Regency TR-1. Texas Instruments built a six transistor prototype board in the spring of 1954. Design directions were formalized in late June and bench work began at Regency Division the first week in July. By this time, the transistor second detector had been replaced by a diode. This reduced the number of transistors to five, which was an important step for control of costs. Next, parts were saved and current drain from the battery was reduced by utilizing bias voltage for the I.F. Stages that was already available in the circuit of the audio output stage.

By August, a new single transistor oscillator-mixer circuit was developed, reducing the number of transistors to four. Both the biasing circuit and the oscillator-mixer circuit were registered as I.D.E.A. patents by the U.S. Patent Office.

Introduction of the TR-1 was one of the best kept secrets in the Industry.

Competitors were caught short and required several months of development and tooling in order to catch up with the introduction of the transistor radio.

The plastic case was the last item to be tooled and was not ready until October, just in time for the Christmas Season introduction. The case was tooled in Chicago and was molded in Indiana.

Because of the new circuitry and compact size, almost every component in the set had to be designed and produced by the various component suppliers. Jensen designed the compact 2 3/4 inch dynamic speaker. The new Centralab Flatcaps were used. CTS supplied the miniature volume control, but was unable to tool a battery switch for the small space available. To clear this hurdle, I.D.E.A. designed a spring actuator switch in front of the volume control, which was operated by a lobe or cam molded on the shank of the volume control edgewheel knob.

Raytheon supplied the original CK706 diode detector. Cornell Dubilier supplied sample low voltage electrolytics in a miniature design for the original T.I. prototype. However, when production quantities were needed, C.D. had not set up a production line for this item. I.D.E.A. then contacted a company in Nashville, Tennessee who supplied a miniature electrolytic capacitor in a phenolic impregnated paper tube. At a later date, the first paper tube capacitors were found to have a very short life, sometimes drying up



as early as six months. This problem was resolved with the introduction of ceramic package electrolytics by I.E.I. Company.

Low impedance antenna coils were not available on the market at that time, so Regency Division wound their own. I.D.E.A. designed and Vokar produced the special miniature 262Kc I.F. transformers. This low I.F. frequency was required because of a 3 to 6 db loss per stage at the standard 455 Kc with the available Germanium grown junction transistors. As soon as transistors with higher gain and better frequency response were available, the I.F. frequency was changed to the standard 455 Kc. The first Regency set to make this change was the Model TR-4, designed by Robert Liggett.

Radio Condenser Company tooled and produced the special compact two-section variable tuning capacitor with 135 MMF in the antenna section and 110 MMF in the oscillator section, both with standard open plates. Since they had no previous production experience with forming a narrow 15/16 inch condenser frame, an end thrust bearing adjustment was provided for first production parts as a precautionary measure. Two trimmers were also included on the small frame. Spacing of the plastic case was so close that a round depression had to be molded into the inside of the lid in order to provide clearance for the top adjusting screw. Early production sets may be identified by this adjusting screw and case depression.



As with any new and radical design, there were many problems with first production. Board fail-out was as high as 50% at the beginning. Because of the new board design, all new test fixtures were required. Spring loaded phono needles were used for test stations. A three position ferris wheel solder station was designed and built for board soldering.

Two market areas were selected for the TR-1 introduction, New York City and Los Angeles. The new sets were so popular that they began to show up on the black market in Boston and other cities.

Producing enough quality transistors in order to reduce costs was a major problem for Texas Instruments at that time. The original purchase order from Regency Division to T.I. was for one hundred thousand kits of four per kit at the price of ten dollars for each kit. Kits were matched and color coded by Texas Instruments before shipping to Regency Division. In order to unilaterize the I.F. Stages, the R-C networks were varied according to the transistor color codes.

With the advent of increased demand and increased production, transistor prices soon came tumbling down.

The Proceedings of the Institute of Radio Engineers for December of 1954 carried an article on the first transistor radio and pictured the TR-1 beside a teacup on the front cover.

Approximately one year later the model number was changed to TR-1G with a change in the tuning knob design and

a change in the audio output to a PNP transistor. Prior to this time all four were grown junction NPN types. The battery power remained 22½ volts. The standard 2 inch by one inch by 5/8 inch 9 volt battery was not used until introduction of the Model TR-4. The first design required a 22½ volt battery for adequate audio output with the grown junction transistors available at that time.

The Model TR-6 transistor set was the next model introduced in late 1955, also designed by Richard Koch. It was a larger set, measuring 7 inches by 5 inches by 3 inches deep. Included was a large good quality five inch speaker and a push-pull audio output stage for good power. It came in a genuine leather case with a leather handle. A most interesting story is connected with the design of the TR-6. It is probably the most rapid design of a successful production radio set on record. Richard Koch, Chief Engineer, and Robert Cox, Director of Purchases, sat down together one afternoon after working hours and designed the complete TR-6, including the list of materials and components for purchasing, in less than two hours time. It is the first set to use a 9 volt power source in the form of a large rectangular battery, Burgess number C6X. The front end of the set is similar to the TR-1, using NPN transistors for the mixer-oscillator and the two 262Kc I.F. stages. For the audio output stages, a PNP driver is transformer fed into a pair of PNP outputs in a class B audio circuit, resulting in a very good performing radio set.

Raytheon was next on the market with a larger transistor set than the TR-1 in 1955, followed by Bulova, General Electric, RCA, Mitchell and others with various sizes of miniature sets.

Three American physicists, John Bardeen, Walter H. Brattain, and William Shockley of the Bell Telephone Laboratories, invented the point contact transistor in 1947. Patents for the three electrode circuit element utilizing semiconductive materials were filed on June 17, 1948. Patent numbers 2,524,035 was issued on October 3, 1950 to J. Bardeen Et Al. The time span from patent issue to radio production was only four years, a remarkable achievement by I.D.E.A. Regency Division and their component suppliers.

Ross Smith  
CTS Corporation  
Elkhart, Indiana  
September 3, 1983

#### EDITOR SEEKING REPLACEMENT

Your Editor plans to resign effective Dec. 31, 1984. It is time another member of IHRS took over the editorship of the BULLETIN. Anyone interested in the job should contact our President or the present Editor.

The next Editor should have plenty of spare time. Preferably someone not occupied 24 hours a day with old radios, working, and cutting grass.

# Day-Fan

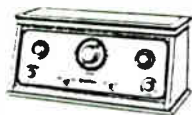
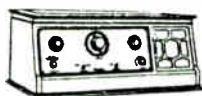
A SHORT HISTORY  
by Alan Douglas

The Dayton Fan & Motor Co., which claimed to have been established in 1889, got into radio like so many other companies, making components, generally of excellent quality. Aside from a one-month fling with "unit-panel" construction (March 1924) they made no complete radios until September 1924, when the OEM-7 (\$98) and the OEM-11 (\$90) were first advertised.



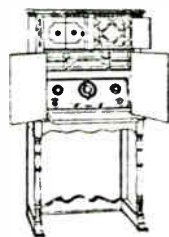
OEM-7

Both were reflexes; the OEM-7 using four tubes and the OEM-11 using three. What the 7 and 11 signified I do not know, but I understand that their designer was Mr. O.E. Marvel. I can testify that the OEM-7 works well, though the distortion is rather high, a common problem with reflexes. The OEM-7 chassis also went into a number of larger cabinets, under such names as Dayradia or Dayola.



Model 5

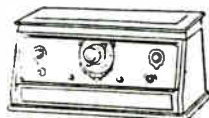
In October 1925, the "1926" Day-Fans appeared: an updated OEM-7 (the "Super-Selective" at \$98), the \$75 OEM-12, and various models of the Day-Fan 5 from \$115 up. I have never seen any of these models.

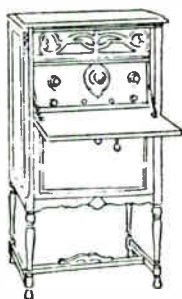


Model 5

August of 1926 brought a new series of Day-Fans: the 5 at \$89, the 6 at \$100, and the 7 at \$115. In September, Day-Fan began their first series of ads outside of the radio magazines, in the Saturday Evening Post. Perhaps

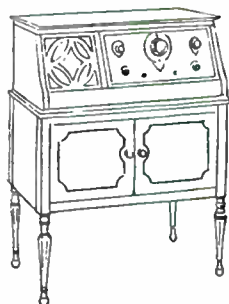
*Day-Fan  
5-6-7 Tube  
\$89.- to \$115.-*





Daymar 7 Tube  
\$195.-

this paid off in increased sales; I've owned two 7s, though I was anything but impressed with their design or their performance, no better than the average five-tube TRF.



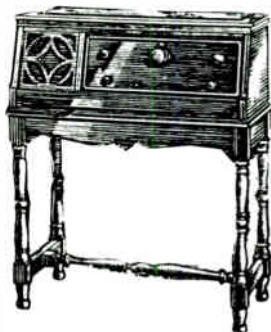
Daycraft 5-6-7 Tube  
\$129.- to \$150.-  
Tablebase extra.

In March 1927 Day-Fan changed their name to the Day-Fan Electric Company. In June 1927 they announced a line of seven battery models, five AC models, and three models operated by self-contained motor-generators. This was an expensive, but highly reliable, method of powering an electric radio.

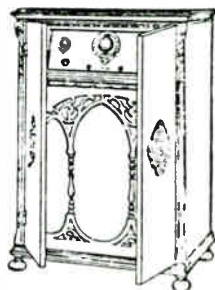


6 Junior

The six-tube chassis was almost the same for all these models, except the \$65 Junior. At some point in 1927 there was a five-tube AC set using three-volt tubes, but the standard chassis with RCA tubes soon won out.



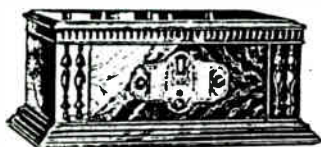
Day-Cee 6



one light socket model operating on an entirely new principle and using neither batteries nor eliminators, but being powered by a motor and generator.

One model which appeared at about this time, but which I have not been able to date or identify, is the 35, a 7-tube battery model costing \$79.50. Likewise, there were later models 67, for \$45, and the 73 for \$65, both 7-tube battery sets.

In June 1928, Day-Fan exhibited their new nine-tube chassis, in various table and console models. Updated in June 1929, this basic design seems to have lasted for as long as Day-Fan remained a separate company. In September 1929



9-tube AC  
June 1928

Day-Fan was bought out by General Motors and became part of that organization; the Day-Fan name being dropped.



9-tube AC  
June 1928

Existing information on Day-Fan models is often conflicting; for instance, the numbers given in the service manuals do not agree with those in Radio Collectors Guide. Day-Fan ads often do not identify the particular models pictured. To help me sort things out, I'd like to ask readers to send me the model numbers on Day-Fans they may own, along with a rough sketch of the panel arrangement. A good black-and-white photo of the set would be most helpful, and will be used (with credit line) in a sequel to this article. I need info on all models except the OEM-7. Any info on the company itself would be useful also.

Alan Douglas  
Box 225  
Pocasset, MA 02559

**MICHIGAN RADIO CORPORATION**

**GRAND RAPIDS, MICHIGAN**



# ZENITH PRESENTS THE INSTRUMENT OF PERFECT MUSICAL RECEPTION

. . . the Stratosphere

★

25 Tubes

High Fidelity

\$750



★ This great instrument definitely proves Zenith leadership in the field of modern radio reception. You sell musical perfection in an instrument produced by engineers who have made the name of Zenith famous.

It is easily the greatest radio performer you ever have demonstrated. The *Stratosphere* has 25 tubes, 3 speakers (2 Concert Dynamics and 1 High Frequency) and 5 wave-bands. It has a tuning range sufficient to get American and all foreign stations.

Tune it in low volume . . . you scarcely can hear its voice across the average room! In full volume it is powerful enough to fill the vast space of any school, church or club auditorium.

*Never once, from full to low volume, does the Stratosphere distort, or omit the rich, full warmth of every note that has come to the microphone . . . one mile or ten thousand miles away!*

Triple Filtering, designed to filter out the sputter,

crackle and noise that comes with long distance reception, has reached perfection in the *Stratosphere*. Its benefit in modern radio reception is here most clearly demonstrated. All the fine points of Zenith engineering and construction are clearly evident in this great new instrument.

We invite your inquiry about the *Stratosphere*.

ZENITH RADIO CORPORATION  
3620 Iron Street, Chicago, Ill.



EXPORT DIVISION - CABLE ADDRESS: ZENITHRAD - ALL CODES



# Notes of Interest

Your antique radio collector club has I H R S name tags for sale at \$2.00 ea. They can be purchased at the next meet.

From August 15 to November, there will be a display of Philo T. Farnsworth image dissectors, multipactors, radios, television, and artifacts from the collection of Dr. Stephen F. and Mary Hofer. This display will be at the Perkins Conference Center on the campus of Eastern Kentucky University. On the next page you will see a map of the area. It is about one mile from Interstate 75.

Frank Heathcote is looking for letters and numbers for interchangeable neon signs. These were advertising signs used by stores back in the forties and fifties. There was a neon transformer and a row of porcelain sockets that the letters plugged into and jumpers to make the blanks to spell out a message. The letters are about 2½ X 4 with a 3 inch extension for the plug in part. If you find any please contact Frank.

Send \$2.00 for your 1984 subscription to the new "ADD-A-PAGE" antique radio parts catalog. A reprint of our column "Antique Radio Corner", a regular feature of the Elementary Electronics magazine, will appear in each issue. James A. Fred, R1, Box 41, Cutler, IN 46920.

## RECEPTRAD

**RADIO RECEPTOR CO.**

59 Bank St.



New York City

- |                     |          |
|---------------------|----------|
| 3. Knights Inn      | 624-2612 |
| 4. Thrifty Dutchman | 623-8813 |
| 5. Penny Pincher    | 623-8126 |
| 6. Bel Air Motel    | 623-9919 |
| 7. Robbins Motel    | 623-0123 |
| 8. Maggard's Motel  | 623-4521 |
| 9. Hines Motel      | 623-9929 |
| 10. Bluegrass Motel | 623-9950 |
| 11. Glyndon Hotel   | 623-1224 |
| 12. Twins Motel     | 623-9908 |



Ex-1  
P-7

# Logansport 1984

The next meeting of the Indiana Historical Radio Society will be at the Riverside Park in Logansport, IN on Saturday July 7, 1984 from 8: AM until 4: PM.

As usual we will have a carry-in dinner, a flea market, and popular vote contest.

Contest categories will be:

1. Radios manufactured west of the Mississippi river between 1920 and 1940.
2. Orphan radios ( private brand radios that you don't know who made it ) example: AdGar, Avon, Croydon, Romancer, and Naxon.

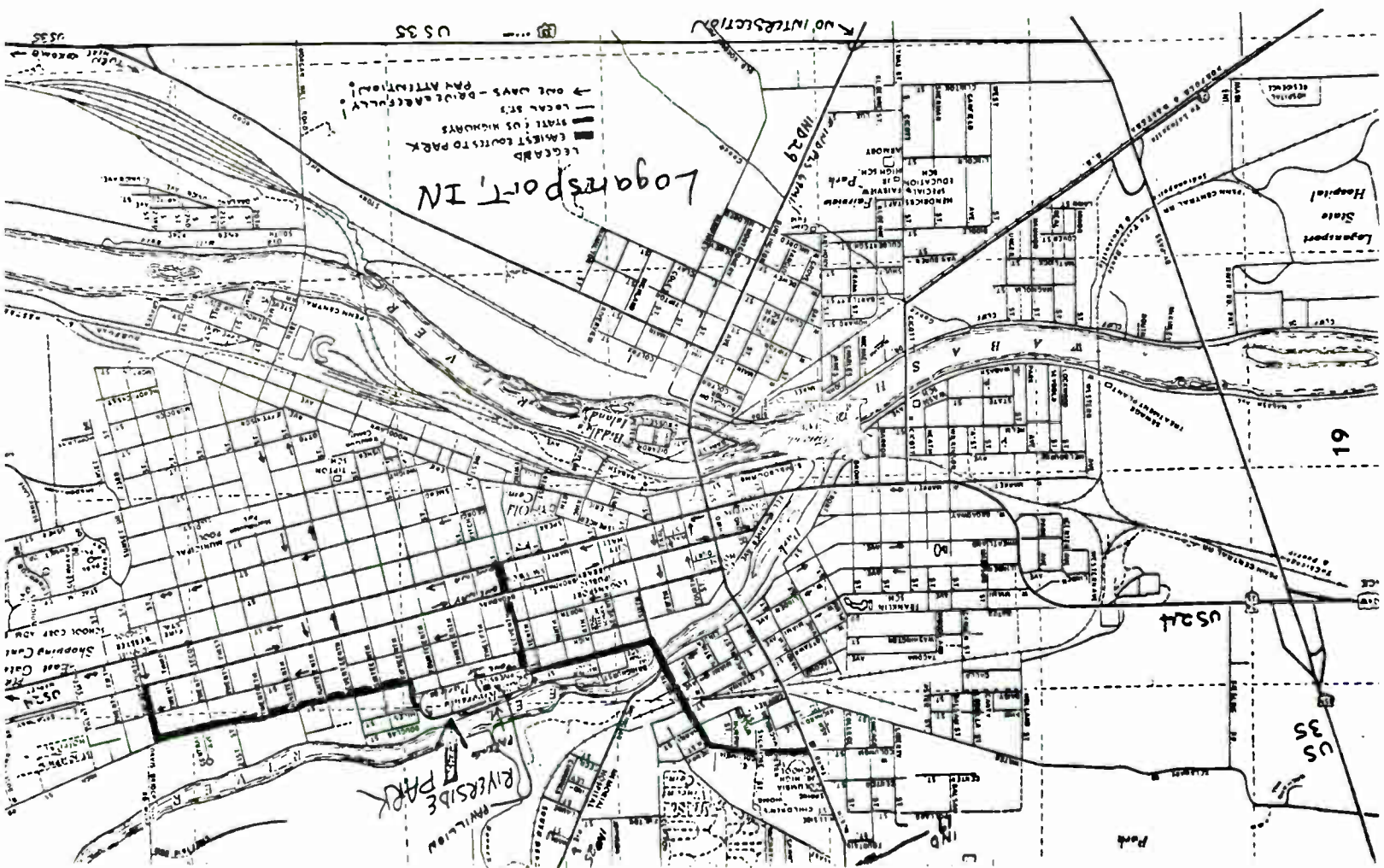
Maybe someone can tell you who your radios parents were.

You can see the printed map for directions, if you have never been to Logansport before. This is one of our most popular meetings so I hope to see a lot of our members there.

## OPELIKA, AL, REVISITED

Most collectors remember the auction sale of Mr. John Herbert Orr in November of 1982. Mr Orr died on May 6, 1984 and his Executor now has to dispose of the finer antique radios retained in his collection.

I've just received a list of these items with prices. Rather than take up the room in this bulletin to list them I will send a copy of the list upon receipt of your SASE. The list is just one page long and contains both radios and phonographs.



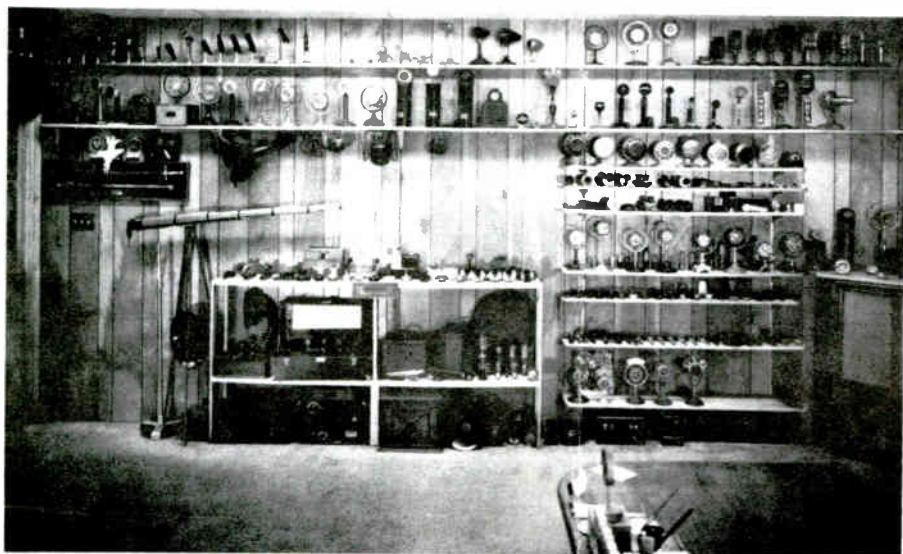
Logansport, IN

LEGARD  
 EARLIEST ROUTES TO PARK  
 STATE US HIGHWAYS  
 LOCAL STS  
 → DISTRICTS - PAY ATTENTION!

RIVERSIDE PARK

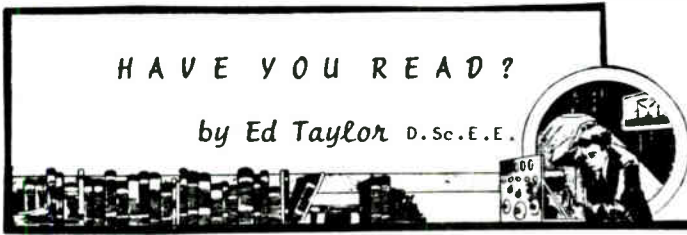


## BOB PAQUETTE'S MICROPHONE MUSEUM



# HAVE YOU READ ?

by Ed Taylor D.Sc.E.E.



## ANTIQUE TELEVISION TOPICS

For those interested in the concepts of early television and collecting vintage television sets, there is now a newsletter on the subject.

The foremost authority on the history and development of television in the United States is considered to be Kenneth L. McIntosh, 907 Radcliffe Road, Baltimore, MD 21204. Mr. McIntosh publishes ANTIQUE TELEVISION TOPICS and each issue has interesting articles on both mechanical and electronic television, the inventors, and tips on restoration.

More and more radio collectors are showing an interest in early T.V. and have receivers on display. C. Francis Jenkins was broadcasting television pictures 55 years ago.

If you would like to receive a sample copy of A.T.T. just send \$1.00 and a S.A.S.E. to the address above.



"Grandpa, is it true when you were a kid you had to watch radio?"

## NOVELTY RADIOS ARE COLLECTIBLE

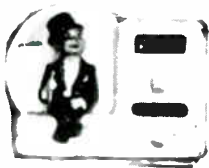
I recently attended a radio auction in Columbus, GA. There were radios, broadcast radio station equipment, and Jukeboxes.

There were several " Novelty " radios in this sale. " Novelty " radios are radios in disguise, ie, a radio that looks like a baseball or a novelty radio may be a conventional radio in a cabinet that is decorated with a cartoon or movie character attached to it, ie, a Charlie McCarthy radio.

Prices of novelty radios using vacuum tubes seem to be increasing every year, while the newer transistorized types seem to be going nowhere.

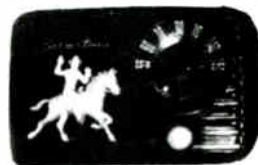
There was a " Hopalong Cassidy " radio in a red painted steel cabinet that sold for \$135.00. A baseball radio in less than good condition went for \$80.00. A full rigged radio ship brought \$55.00. One of the most prized novelty radios is the Charlie McCarthy radio made by Emerson, it brought \$175.00. A red Coca Cola cooler radio sold for \$200.00. A radio in the shape of a velocity microphone brought \$80.00. There was also a black plastic radio with the molded white figure of a cowboy on a horse fastened to the front of the radio. This radio went for \$45.00.

There were nearly 400 radios there, but there isn't room in this Bulletin to list them all.



Charlie  
McCarthy

Jim Fred



Hopalong Cassidy



# RADIOADS

FOR SALE: Battery eliminators for those old sets you'd like to hear play. 1.4 V to 6 V, adjustable and regulated for up to 1.25 amps. Three plate voltages plus an adjustable "C" bias voltage too. Available with or without a case...send a SASE for more info...Now available; a very nice reproduction of the instruction sheet in the lid of your Aeriola Sr. receiver, \$3.00 plus 75¢ handling per order. Tuning dials for Philco radios, Model 33B, 84B, 93B, or 37-84, \$7.50 ea., postpaid. Write to Peter Yanczer, 835 Bricken Pl., St. Louis, MO 63122.

WANTED: Zenith, 6 tube table model 6D014, 1947, in dark brown plastic cabinet. Del Barrett, 1517 Pacific, Ft. Wayne, IN 46819. Phone 219-747-5655.

WANTED: Early Hallicrafters, also related literature, advertising material, etc. Please contact Max de Henseler HB9RS, 333 E. 43 rd St., New York, NY 10017.

WANTED: Speaker for Philco console 40-195 or 38-7, or information on these items. Rick Washburne, R1, Box 19B, Fillmore, IN 46128. Phone 317-246-6755.

FOR SALE: Are your Vintage Radio books getting tattered? Send \$10.95 each for Vintage Radio, Flick of the Switch, and Radio Collectors Guide. Morgan McMahon, Box 2045, Palos Verdes Pnslna. CA 90274.

# WANTED!

## DEAD OR ALIVE!

### The **CONCERT-TROPE** AUTOMATIC PHONOGRAPH

#### A 'Sound' Investment See Us At the Show

[ Booth No. D-62, Demonstrating Room  
in the Ambassador Hotel ]



#### Concert-Trope

- 1. Picking selections continuously
- 2. Changes records automatically
- 3. Makes record play by itself
- 4. Highest quality sound throughout

#### Concert-Trope

- 1. First ever automatic
- 2. Positive action
- 3. Extreme simplicity
- 4. Few working parts
- 5. Beautiful decorative design

Write for Brochure  
Proprietor

CONCERT-TROPE MANUFACTURING CORP.  
Indianapolis, Ind.

CONCERT-TROPE MFG. CORP., INDIANAPOLIS, IN

PRODUCT: Automatic Phonograph, 33 selections,  
both sides, and only in sequence.

Incorporated on May 1, 1929, Capitol \$50,000.

OFFICERS: President- George M. Watts  
Vice-President- W.R. Loomis  
Secretary- T. M. Overly  
Treasurer- C. O. Gooding

Factory located at 820 E. Market St., 1930 & 1931

If you have any knowledge or information about  
this company or this product write to: James A.  
Fred, R 1, Box 41, Cutler, Indiana 46920.