

Indiana Historical Radio Society

BULLETIN

Vol. 11

September, 1982

No. 3



ED WYNN

**"How can I make anti-freeze?"
"Hide her woolen pajamas."**



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FOR SOCIETY INFORMATION WRITE TO:

Vice President - For legal matters of the I H R S.
 Secretary - For general correspondence and membership applications.
 Treasurer - For membership payments and address changes. (1982 I H R S membership dues remain \$6.00.)
 Historian - For history of the I H R S and for donations of material for the Society Scrapbook.

Please use a Self Addressed Stamped Envelope when requesting information.

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INDIANA HISTORICAL RADIO SOCIETY

FALL MEETING - SEPTEMBER 18, 1982

AT VALPO TECH IN VALPARASIO, INDIANA

The Indiana Historical Radio Society will hold its fall meeting at Valparasio Technical Institute and The Wilbur H. Cummings Museum of Electronics. The meeting site is located on Lincoln Way West, Indiana Road 130, eight (8) blocks West of the intersection of Indiana Road 49.

Meeting Schedule - Central Daylight Time:

9:30 AM COFFEE AND DOUGHNUTS for the early birds.

10:00 AM The Wilbur H. Cummings MUSEUM of ELECTRONICS will be open. The Museum has grown since the last I H R S visit. A new wing with an exhibition of two collections of early publications and the Alfred H. Hayes collection of radios and components was dedicated last March.

10:00 AM SWAP N SELL in the parking lot. (Inside incase of rain.) Display tables will be available to show your choice radio items.

11:00 AM PROGRAM - Restoring the Wood and the Electronics in Vintage Radios. Presented by Valpo Tech Engineering Technology graduates Mark Beutler and Bruce Smith. Mark and Bruce developed these skills as curators of the schools museum.

12:00 Noon COMPLIMENTARY BUFFET, courtesy of the Valpo Tech Alumni Association. IMPORTANT! So the Association knows how to plan for the luncheon, send a card saying you will attend to Art Hershmen, Valparasio Technical Institute, P.O. Box 490, Valparasio, Indiana 46383, or call (219)462-2191 by September 16, 1982.

1:00 PM Business Meeting and election of 1983 I H R S Officers.

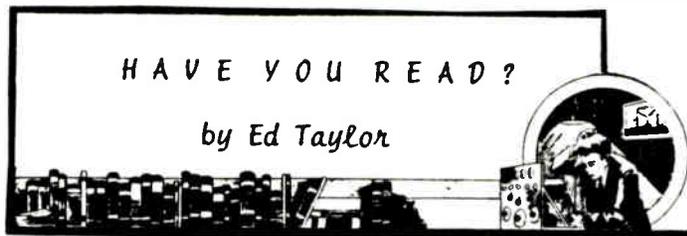
2:00 PM Museum of Electronics will be open.

3:30 PM Have a pleasent trip home.



HAVE YOU READ?

by Ed Taylor



THE PANIC BROADCAST

PORTRAIT OF AN EVENT BY
HOWARD KOCH

Where were you on Hallowe'en in 1938? Did you hear one of the most famous radio broadcasts ever made? Did you know there was a book written about this radio play and it's aftermath?

..."Ladies and gentlemen: We interrupt this program for the following announcement... Strange beings have landed in the Jersey farmlands tonight and are the vanguard of an invading army from Mars... They are now in control of the middle section of New Jersey and have cut the state through it's center..."

On October 30, 1938, the planet earth was invaded by men from Mars... Here and there people suddenly dropped to their knees and began to moan and babble. Housewives wept, tore their hair and fell into swoons. Grown men wept, too, and dashed about in the streets. Telephone lines were clogged with calls. In a few hours more Red Cross and the National Guard would have had to be mobilized.

Howard Koch was there. In fact, he wrote the radio script that caused it all. Through research, interviews, and personal recollections, he recreates, in this book, the terror and excitement of that night when America-quite literally- lost it's wits.

Also included are thirty-three pages of contemporary photographs, cartoons, and newspaper articles depicting the event and it's aftermath, plus the complete, unabridged text itself as performed by Orson Wells and his Mercury Theatre - THE INVASION FROM MARS.

1970 LITTLE BROWN AND COMPANY
BOSTON - TORONTO



ANNUAL ELECTION OF I H R S OFFICERS - 1983

The Nominating Committee for the 1983 I H R S Officers present the following candidates for office:

President	Frank Heathcote
Vice President	Jerry Heuber
Secretary	Jim Fred
Treasurer	Marshall Howenstein
Editor	Fred Prohl
Historian	Ed Taylor

Additional nominations will be taken from the floor at the Valpo Tech meeting.

The Nominating Committee:
Don Johnston, Ed Taylor and Eric von Grimmenstein

DESCRIPTIVE LIST OF ATWATER KENT RECEIVERS

Part No.	Model No.	Tubes	"Open" or Board Type Battery Sets
4052	..	4	Type "11" tuner, 1 stage fixed R.F., det. and 2 stage amp. unit, potentiometer control.
4066	..	5	Type "11" tuner, 2 stages fixed R.F., det. and 2 stage amp. unit, potentiometer control.
4340	10	5	Two stages tuned R.F., 3 variable condensers, 3 R.F. transformers, detector, 2 stage unit and potentiometer. Gray-green condensers.
4445	9	4	One stage tuned R.F. amp., 2 tuners and det. 2 stage unit, potentiometer control.
4333	5	5	Type "11" tuner, 2 stages fixed R.F., det. and 2 audio—all tubes in one metal container.
4600	10	5	Two stages tuned R.F.—3 var. condensers, etc., same as No. 4340, but different wiring.
4550	10A & 10B	5	(10B has 3 tap ant. switch.) Similar to 4340. Brown conds., with battery cable attached.
4560	10A & 10B	5	(10B has 3 tap ant. switch.) Same as 4550, but black variable condensers.
4620	12	6	Two stages R.F., det. and 3 stages audio—3 variable condensers, cable attached.
4700	10	5	Similar to 4340 & 10B 4550-4560. No pot. One R.F. rheostat only for both R.F. tubes.
4910	12	6	Similar to 4620, but with switch to control last audio stage, and no potentiometer.
Cabinet Type Battery Sets			
4640	20	5	Two stages tuned R.F., large cabinet, 3 dials, 3 pt. ant. tap switch, 2 rheostats.
4880	19	4	One stage tuned R.F., large cabinet, 2 dials, 3 pt. ant. tap switch, 2 rheostats.
4920	24	5	Same as 4640, but in "deluxe" cabinet, with feet.
7570	20 Compact	5	Small mahogany cabinet, 3 dials, tap switch, battery cable attached.
7780	21	5	Same as No. 7570, but with sockets and rheostats for 3-volt dry cell tubes.
7960	20 Compact	5	Same as No. 7570, but with "UX" type sockets and other refinements.
8000	30	6	One tuning dial, small mahogany cabinet, two rheostats, 3 stages R.F.
8100	35	6	Metal cabinet, tubes inserted from bottom—one dial, one rheostat, ship-type name-plate.
8270	32	7	Long cabinet, one dial, two rheostats—4 stages R.F. double R.F. transformers.
8930	33	6	Small mahogany cabinet, one dial, ant. adj. knob, two rheostats, double R.F. transformers.
8500	50	7	Large deep mahogany cabinet, several metal shielded compartments inside, one dial, antenna adjusting knob, 2 rheostats.
9840	48	6	Similar to Model 30, but gold panel.
9860	49	6	Similar to Model 33, but gold panel.
A.C. Sets—Using "A.C. Tubes"			
9390	36	6 and rect.	Small mahogany cabinet, same as Model 33; Type Y (metal), A.C. power unit goes with Model 36 set.
9500	37	" "	Metal cabinet contains set and power unit, 3 stages R.F., 1 dial, 1 volume control knob, ship-type nameplate.
9400	38	7 "	Same as Model 37, but double R.F. transformers and 4 stages R.F. amp., 1 dial.
9800	40	6 "	Same as Model 37, metal cabinet, but black dial and volume knob and other minor differences; modernistic nameplate.
9850	42	" "	Same as Model 40, but with automatic voltage reg., ball feet, dial in 5 divisions.
9900	44	7 "	Same as Model 42, but with double R.F. transformers, 4 stages R.F. amp.
9930	52	6 "	Console type—metal stand, speaker in base, antenna and ground leads supplied; set chassis same as Model 42.
Direct Current (110-Volt) Sets			
9910	41	7	Metal cabinet contains set and power unit, 3 stages R.F., detector, 2 stages A.F. (last stage "push-pull" type, 3 tubes, one mounted on right-hand side of power unit). Filaments in series. Chassis similar in appearance to Models 37, 40, 42 and 52.

LOGANSFORT MEET

On June 19th IHRS held its summer meet at Riverside park in Logansport. The day began with cool and cloudy weather and the threat of rain; however by noon the sun came out and the weather cleared up in time for an enjoyable picnic dinner carried in by those who came. It was a family affair and over forty attended.

An auction was held in the afternoon which was arranged by President, Frank Heathcote. A professional auctioneer, Steve Waldron, pictured in this bulletin, donated his services to the club and disposed of the rest of the old radios and equipment left over from the Auburn meet. Over \$800.00 was taken in, which amount added to the profit made at Auburn, cleared over \$1200 for the "ill advised" expenditure invested by several club members. This money is to be used towards future expenditures at our annual meet in Auburn. This year's meet at Auburn found the club in the red. It is hoped that Mr. Waldron will do us the honor again sometime in the future. Many, many thanks to him for his contribution.

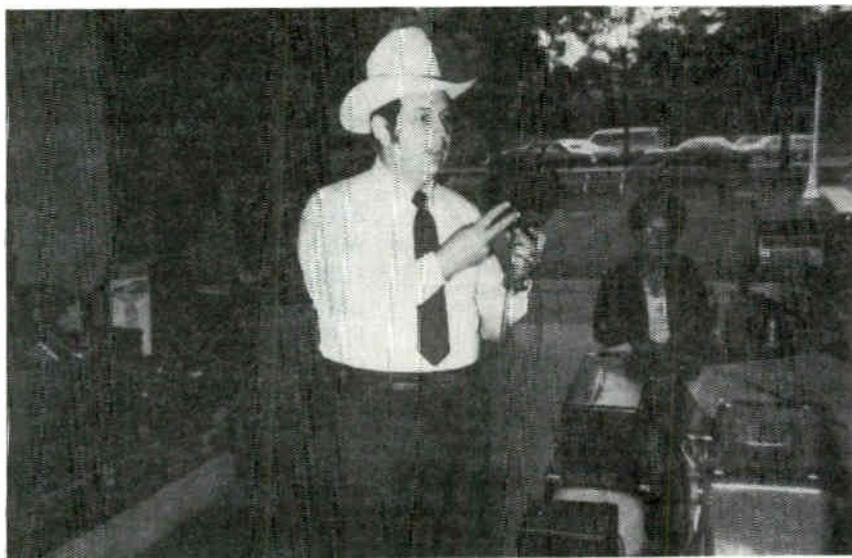
Marshall Howenstein



**Sears, Roebuck
and Co.**
CHICAGO—
PHILADELPHIA



Part of the crowd and equipment auctioned off at the Logansport meet, June 19, 1982.



Steve Waldron, auctioneer at Logansport.

AUBURN - CORD - DUSENBERG MUSEUM
AUBURN, INDIANA

Most of our members have enjoyed the I H R S Museum on the second floor of the Auburn-Cord-Dusenbergl Museum since its beginnings in 1976. For those readers who have not visited OUR museum here is some information:

The I H R S Museum is a display titled "The Golden Age of Home Entertainment". It consists of crystal sets, battery sets, AC sets, telephones, and victrolas. Del Barrett of Fort Wayne has loaned most of the equipment and has put together the attractive display. Other members and friends have made loans and donations to complete the display. The museum itself consists of over sixty Classic and Historical cars, making it one of the most outstanding museums in the midwest. It also has a small book and gift store and snack bar. It is open seven days a week. From May 1st to September 30th, it is open 9am to 9pm. From October 1st to April 30th, it is open 10am to 5pm. The admission charge is \$3.50 per adult. The I H R S Museum budget is met from cash contributions and auction earnings. Everyone is welcome!

Jerry Hueber

Coolidge Broadcast A First

When President Calvin Coolidge addressed a joint session of Congress on December 6, 1923, he created another first. His Presidential message was the first ever broadcast over that new-fangled invention, the radio. The Communications Collection at Henry Ford Museum, Dearborn, Mich., includes four different models of the 1923 Radiola radio among the dozens of early radios and televisions on exhibit.

Another Bright Idea

New York City's first electric company was incorporated December 17, 1880, a century ago. Incorporated under the name, The Edison Electric Illuminating Company, it was to provide New York with incandescent lighting. The company had its beginnings a year earlier when Thomas Edison perfected his electric light in his Menlo Park, N.J. laboratory, now one of the many historic structures which make up Greenfield Village, Dearborn, Mich.

DeFOREST W6 RENAISSANCE

Readers with long memories will recall this set being pictured in the December 1977 A W A Old Timers Bulletin. It was made around December 1925, the last model the DeForest Radio Company made before going into receivership. It doesn't remotely resemble any other model they (or anyone else) made, and one can only guess at their motives — whether to pick up prestige for their line, or to bring in the needed cash to keep the company solvent — who knows? It sold for the fabulous sum of \$450.00.

The circuitry is two stages of capacity-neutralized TRF, detector, and two audio; a third stage can be switched in for extra power. This third stage has its own B and C connections, tagged +225 volts and -18 volts; these voltages are too high for the tubes listed in the sales literature: DV2, DV3, or DV5.* What tube was supposed to go there? The brochure consistently refers to the W6 as a five tube set.

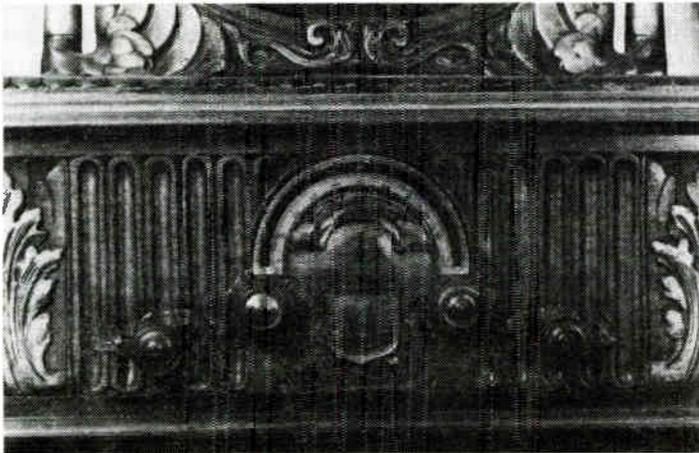
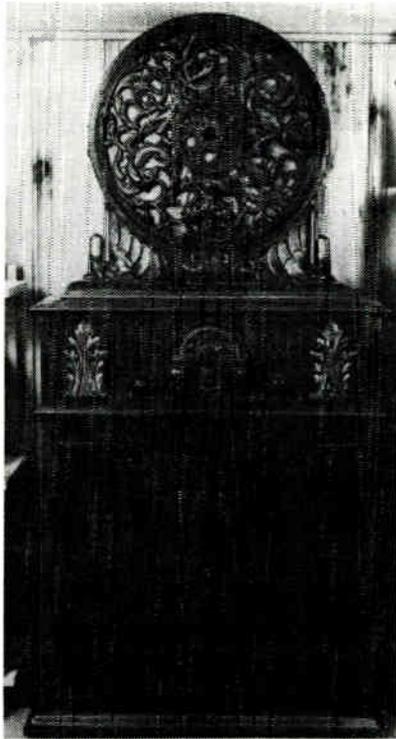
The cabinet is a magnificent piece of workmanship, obviously hand made. It is solid walnut, hand carved on all four sides. The speaker framework, which houses a 20" free edge cone, is cast plaster or paper mache', painted brown, gold and silver. To quote from the sales brochure: "What a beauty, and how different! Graceful, artistically designed, it harmonizes with practically any furniture period. There it stood in the middle of the room, unobtrusive yet exquisitely ornamental." Oh, yeah?

Performance is rather good, considering that it uses only a built in loop. It whistled like the birdies before neutralizing, but now tunes sharply, and is always ready to perform for visitors. In spite of heavy advertising, this model, and the smaller but similar W5, did not sell well — this one is serial number 3!

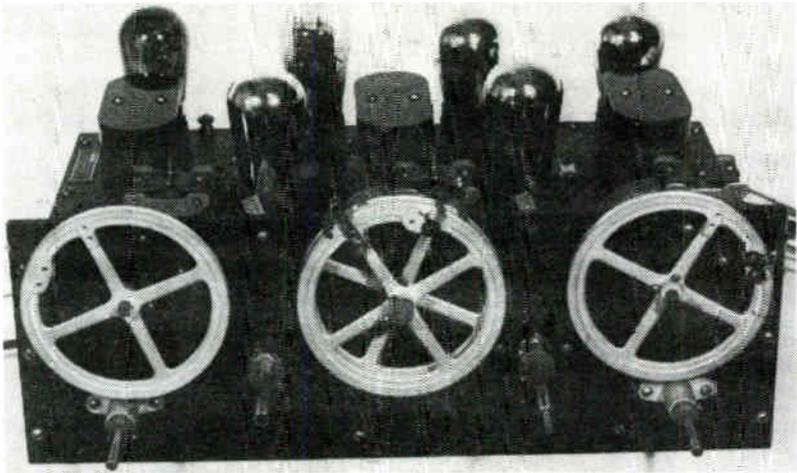
Alan S. Douglas

*The DV7 and DL series of high power audio tubes, in spite of their antique appearance, were not produced until 1926-1927.

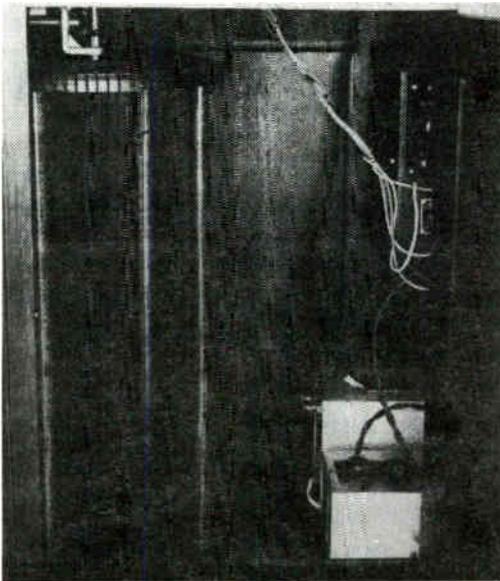




Close up of the panel. The two large knobs control tuning capacitors, the 2nd and 3rd stages being ganged. A 2nd stage trimmer is coaxial with the right knob. Dial pointers are shown here at 50 and 52. The outer knobs operate filament rheostats.



Chassis view. The RF coils have a more than passing resemblance to Grebe Binocular coils, even to being wound with green Litz wire. These tubes, of course, are not deForest.



Interior of the base, showing the loop, rotated by a knob on the left side through bevel gears. The A and B eliminators are my additions.

SIXTY YEARS OF BROADCASTING

Purdue University's radio station WBAA is celebrating 60 years of continuous broadcasting this year.

Recognized as Indiana's first broadcasting station, WBAA was licensed to broadcast in 1922 and began operating on April 4th.

Owned and operated by Purdue University as a public service station it caters to the students as well as the general public.

WBAA broadcasts on 920 Khz with a daytime power of 5000 watts and 1000 watts after sundown. Its studios are located in the lower level of the Hall of Music and its towers are located about three miles south of the city of Lafayette.

Mr. David Bunte is manager of the station.

* * * * *

Recent donations to the I H R S Museum at Auburn are: 1929 Edison Console, Lo-Boy Radio Phono with dated plaque, a 1924 Slagle receiver (5 tube table model and a large oval speaker), and a UZ1325 Radiola horn. All items are now on display.

* * * * *

Hardin McCauley reports that he has placed his Radio Telegraph and related items on display in the old Court House in Crown Point, Indiana. The Court House is on the Square in the center of town and is open from 12:00 PM to 4:00PM Friday and Saturday through the summer and fall.

WIRELESS TELEGRAPHY

On Board A Japanese Warship.

(By T.M.)

The day preceding the departure of the Imperial Japanese Squadron from South Australian waters, a party of telegraphists from the Adelaide office journeyed to the Anchorage with the avowed intention of "doing" the Flagship for all she was worth.

Immediately on gaining the deck of that vessel, one of their number interviewed the Commander, and after brief explanations the necessary instructions were issued for the party to be conducted below to the ship's "Sanctum Sanctorum" - Telegraph Office.

Our guide, Mr Y. Takahashi, who, by the way, had visited our Operating Room and worked our jiggers earlier in the week, was delighted by the return visit on our part, and proved very affable and unceasing in his efforts to please. We were conducted by him to a compact apartment or cabin abaft the bridge on the port side.

The room seemed full of electrical gear, but a careful inspection satisfied us that there were no superfluous parts; moreover, the right position on the tables for each piece had been very carefully considered. One could not fail to notice that convenience for the operator had been aimed at here, and achieved.

A brief description of the latest Wireless Telegraph Instruments with the Modus Operandi will not be out of place in these columns.

On approaching the Flagship, we had noticed a system of parallel telegraph wires (about 20) reaching from the deck to the top of the mast. The wires were held apart by metallic rings, fixed at equal distances from each other, the whole affair resembling an elongated bird-cage. This contrivance constitutes the Aerial "Collector" or "Distributor"; and is, of course, very highly insulated from the ironwork of the ship. A separate insulated wire is attached to the end of the "Aerial," which, after passing through the deck, terminates in a flexible wire and massive brass plug hanging from the roof of the cabin.

Intense astonishment was evinced by the party when their attention was directed to the induction coil. Its great dimensions drew forth more than one "Colonial" expression, perhaps more forcible than elegant! The lay mind usually associates the term "induction coil", with something akin to an ordinary medical coil measuring a few inches in length.

The coil under notice is minus the usual vibrator or "Circuit Interrupter," and by the uninitiated, might be mistaken for an oil-drum, highly polished. Its length, however, approximates three feet, and it contains many miles of insulated wire.

Hard by was the Relay, mounted and swung on gimbals in the manner of a ship's compass. The base of it being heavily weighted, it does not follow the ship's motion but retains an upright position. Some ordinary plugs and switches,

a massive sending key, and an ordinary Morse ink-writer, nearly completes the outfit; but the most important part of the receiving apparatus (the Coherer) was stowed away in a metal box and so protected from undesirable electric disturbances.

The Marconi Coherer consists of a small glass tube, partially exhausted of air, each end being fitted with a silver plug. A tiny pinch of nickel and silver filings, with a mere trace of mercury, is placed in the space (about 1/16 of an inch) between these plugs. So long as the filings remain loosely together, they offer very great resistance to the passage of an electric current, but it is found that, under the influence of the transmitting spark, which may be many miles away - minute though the disturbance is - the Coherer feels it; the filings cling together or cohere, and their resistance instantly falling to a few ohms, a bridge is made for the local battery current to pass, which local current actuates the Relay. The Relay, of course, brings into play a separate local battery and the ink-writer (or Recorder).

After each signal it is necessary to disturb the filings to terminate that signal and prepare them to receive the next. This is done automatically, a small hammer gently tapping the Coherer at the right moment.

To begin active operations, the massive brass plug (which as mentioned above connects with the "Aerial") was moved from "receive" to "sending" standard. The sending battery (charged accumulators) was now switched on, and the "Circuit-Interrupter" put in motion. This contrivance consists of a separate electro motor, of beautiful design, and performs much the same duty as the vibrator fixed on the end of an ordinary medical coil. By means of an ingenious electric slide, the strength of sending current is increased at will, according to the distance it is desired to communicate. During our visit an Amper-Meter on the wall indicated three amperes of current, this being sufficient to communicate for a distance of 12 miles. The slide, if utilised to the full extent, would throw 10 amperes through the "primary" of the induction coil, this being the necessary current required (with these instruments) to communicate 40 miles.

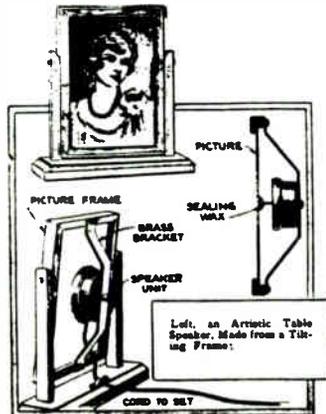
Our guide now depressed the key, which action immediately produced a powerful electric spark between two highly polished metal balls, placed in a corner of the office. This "spark-gap" is adjustable, the metal balls being set about two inches apart during our visit. Every tap of the key produced really a torrent of two-inch sparks of great energy, the duration of the sparks being long or short, according to key movements. This is the mode of transmission. The act of moving the massive brass plug a moment earlier placed one ball in direct connection with the "Aerial," the other ball being always earthed. Every spark gives rise to a peculiar electric oscillation in the ether which surrounds the molecules of all matter. These oscillations are called Hertz waves. They radiate in all directions. We are now sending energy away into space, through the side of the Flagship, through our own bodies, penetrating the walls and roofs of buildings on shore, but the waves manifest themselves only on the Coherer (or Coherers) in sympathy or previously tuned to receive them.

We expressed a desire to speak the "Matsunehima", and our guide promptly began calling "D". The signal must have been audible outside the room, owing to the violent "snap" of the spark. (The operator is practically manipulating young streaks of lightning.) After a few calls had been made, the "Interrupter" was turned off, and the delicate Coherer thrown in circuit with the "Aerial." The party waited with an expression of great expectancy, but no response came. Our guide remarked that as it was just dinner time on board that vessel, no doubt all hands were too busy to hear the call. He then tried the "Itsukunehima," which was anchored further out. Presently a bell tinkled and a quivering noise was heard (the tapper-back). Our guide started the tape mechanism, and to the amazement and delight of the visitors, beautiful signals were received on the Morse ink-writer. They seemed to be coming in from nowhere.

The Japanese use precisely the same code as we do, but we acknowledged ourselves beaten when trying to translate Japanese words. The signals were there perfect in every respect, but our minds were pre-occupied trying to realize the magnitude of Marconi's marvellous achievement, and we acknowledge ourselves beaten again; for it is undoubtedly the most wonderful discovery every made by the mind of man.

Submitted by Fin Stewart

Tips from the Radio Lab.



★ ★ RADIOADS ★ ★

FROM THE MAIL BAG: FOR SALE: Stewart-Warner Concert Grand Model 11-8R9. This set was purchased in 1941 and has AM/FM radio (old FM band), phonograph, public address, and home recording system. (Disc) Microphone works with radio, phonograph, or recorder. Magic antenna control. Contact Mrs. Albert D. Bailey, 5144 S. Atherton Dr., Indianapolis, IN 46219. Phone (317) 357-9536.

FOR SALE: Museum clearance of duplicate British and European tubes 1923 to 1940. Prices reasonable. Will trade some for Arcturus blue 150 or V99. Also trade new boxed G.E. TBI for Moorhead spherical type E. Fin Stewart, 673 Gt. Western Hwy, Faulconbridge. N.S.W. 2776, Australia.

WANTED: EH Scott radios, literature (especially Scott News), and related Scott memorabilia. Jim Clark, 1006 Pendleton Dr., Lansing, MI 48917

WANTED: Chassis/junker AK165 cat; 8" speaker and field RCAT6-1; 6" speaker and field, dial escutcheon Crosley 148; home battery box and/or antennae Radiola 26; one smaller knob AK567cat; one orange celluloid knob FADA 1000; 6" speaker and field and/or dial Philco 37-84cat (or junkers); Cathedral radios. Marc Carlson, 587 11th Street, Brooklyn, NY 11215

WANTED for the I H R S Museum display at Auburn, Large Early Radio Advertising. Would like to have it donated or we can purchase items. Del Barrett, 1517 Pacific Drive, Fort Wayne, IN 46819

MUSIKTRON
RADIO TUBE

★ ★ RADIOADS ★ ★

WANTED: A-K 165 Chassis; 6" speaker for Philco 37-84; 6" speaker for Crosley 148; 8" speaker for RCA T6-1; loop and battery box for Radiola 26; as is cat-combs. Marc Carlson, 587 11th. St., Brooklyn, NY 11215

WANTED: 1931 Philco model 90-B. Paul Martin, C/O Comm. Design Research, 60 "K" St. South Boston, MA 02127

WANTED: Radio Design magazines, Vol 1: #1, 2, 3, and 4, Vol 4:#1, Radio News October 1928. Pilot audio transformers. David T. McKenzie, 170 West 53rd Street, Hialeah, Florida 33012

FOR SALE: Radiola 60, Radiola 18, both with 100A speakers, AK40, 44, 46, 55, with speakers. All above restored and playing. Price for radio and speaker is \$125.00. Also have Radiola 60, 17, and 30 (no top) not restored or checked, some tubes, \$42.00 plus shipping. Have other sets for sale. Send SASE for complete list number 82-1. David T. McKenzie, 170 West 53rd Street, Hialeah, Fla. 33012

WANTED: A Riley Radio Power Unit, manufactured in Attica, IN in 1926. James Fred, Cutler, Indiana 46920.

WANTED Buy or Trade: Paragon type RA tuner to go with a DA2 Amplifier. I have a small antique Stirling Cycle Engine (bore and stroke is 2"x1.25") for trade or misc. radio items. Peter Yanczer, 835 Bricken Place, Warson Woods, MO 63122



UNUSUAL SUBSTITUTION FOR 01A'S

If you run short of good 01A tubes and want to hear one of your old battery radios of the early 20's, here is an excellent substitution. Use the old a.c. amplifier workhorse -- the one and one half volt 226. This is the tube used in most of the 1927 - 29 a.c. sets such as the RCA 18 and the AK 40. The 4-prong UX base is exactly right, and some of the early 26's had side pins to use with the UV sockets.

If you are wondering about the low A voltage of the 26 tube, the beauty of this substitution is that the 26 operates fine off the 6-volt d.c. supply that is used for 01A tubes.

I discovered this substitution just by chance when I was checking out a Tuska 224 to see if it was operating OK. I grabbed several 01A's from my spare tubes box and tried them all until I found the one that worked best. When I took the "good playing 01A" out of the set to put away I happened to notice that it was stamped 226! My first thought was why didn't it burn out on the 6 volts it had been subjected to? Perhaps it was an 01A that was mislabeled? I finally decided to try several other 26's and found that they all worked.

The riddle is solved when both the voltage and the current are considered. The 26 operates on 1.5 volts at 1.05 amps while the 01A uses 5 volts at 0.25 amps. The resistance of the 01A is 14 times as much as the resistance of the 26. So, the rheostat easily drops the voltage sufficiently for correct operating conditions.

I would be a little concerned about operating several 26's in place of 01A's in parallel circuits because of the high current drain, but 2 or 3 in series should be OK.

Walt Sanders



* FREE *



* FREE *

WOW !

Do you remember those special, glistening white, silk-screened IHRS decals you received in 1980? Headquarters has just acquired another shipment of these decals so in case you have traded cars, and yours got away, or if you just want a couple more they are available absolutely free.

This is the world famous, authentic logo of the IHRS. A distinctive emblem that can be mounted on the inside of your car windshield or windows. Make sure the glass surface is clean, peel off the paper backing, and these nifty decals will self-ad here. No need to use water to stick them on.

No one but IHRS members can proudly display this outstanding, classy memento.

To get your spectacular emblems see Ed Taylor or Marshall Howenstein at the next IHRS meeting or send a S.A.S.E. to: IHRS, 245 N. Oakland Ave. Indianapolis, IN 46201.

30/- EACH.



D.V. 3
Filament, 3 Volts,
.06 Amp.



D.V. 2
Filament, 5 Volts,
.25 Amp.

Both Types Fit Standard American Socket.

MADE BY—



THE MAN WHO INVENTED BROADCASTING.

DE FOREST VALVES

TYPE D.V.2—Takes 5 Volts at $\frac{1}{2}$ Amp. on Filament 30/- each
Plate Voltage, Detector 18-22 $\frac{1}{2}$ Volts; Plate Voltage, Amplifier 60-150 Volts.

TYPE D.V. 3—Takes 3 Volts at .06 of an Amp. on Filament 30/- each
Plate Voltage, 16-22 $\frac{1}{2}$ Volts, Detector; Plate Voltage, 60-120 Volts, used as an Amplifier.

Both Types Fit Standard American Socket.

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