

The Jersey Broadcaster

NEWSLETTER OF THE NEW JERSEY ANTIQUE RADIO CLUB

July 2004

Volume 10 Issue 7



MEETING/ ACTIVITY NOTES

Reported by Marv Beeferman

During last month's meeting, the club viewed a 20-minute video of a 1949 Bell System film titled "bottle of Magic" which traced the development of the vacuum tube. We were also treated to another professional video production by Dave Sica taking us on a tour of this year's Early Television Convention. A high point of the convention, we're told, was member Scott Marshall's controversial presentation on Philo Farnsworth. We hope to have a repeat performance sometime in the future, or at least after the New Jersey tomatoes go out of season to avoid some potentially aggressive reactions.

The meeting ended with an auction of donated items, some of which were owned by the late Harry R. Smith whose biography appears in this month's *Broadcaster*. As part of his career with Mackay Radio and Telegraph of Clark, New Jersey, Mr. Smith was actively involved in the design of marine and communication equipment. A beautiful 1964 Mackay 3010B marine radio is now in the trust of John Ruccolo who tells me that it didn't take much to get the radio back on the air. As an example of the Garden State's rich communications history, the receiver should provide great material for a future *Broadcaster* article, a club presentation and a New Jersey theme exhibit

On a similar note, several months ago, the club came in possession of a very nice and historic Stromberg Carlson high-end console. The club plans to exhibit it at InfoAge and it is presently stored in cottage #2. It's in really great shape except for a small water-damaged area on the top of the



MEETING NOTICE

The next meeting of the NJARC will take place on Friday, July 9th at 7:30 PM at the David Sarnoff Library in Princeton NJ. See the NJARC web site or contact Phil Vourtsis at 732-446-2427 for directions.

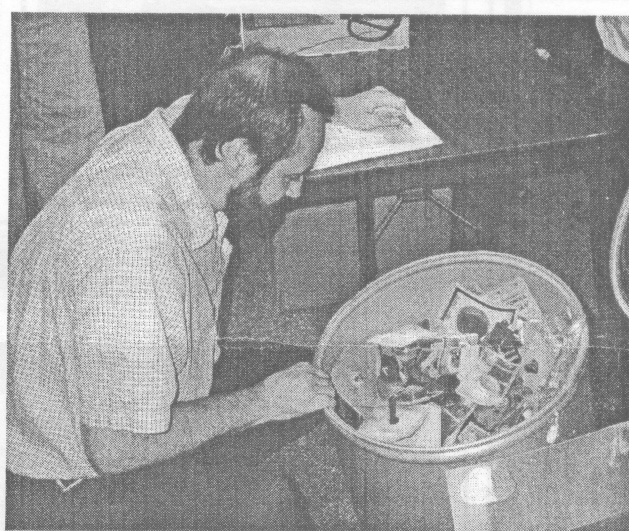
At this month's meeting, Technical Coordinator Al Klase will take a look at the "whys" and "wherefores" of tubes with more than one grid in a presentation he calls "Beyond the Triode."

Our next Repair Clinic is scheduled for July 24th at the Sarnoff Library and our Summer swapmeet is July 31st - read all about it in this month's *Broadcaster*.

cabinet. The remainder of the cabinet is in excellent condition and we need a volunteer to restore just the marred portion of the top. If you're interested in helping out, please contact Ray Chase at enrpnr@erols.com.

we purchased from the Sarnoff library. Our first work day will be Saturday, July 10th; we have two window air conditioners to install, general cleaning and repair, preparation of the upstairs library and a host of details to attend to. If you prefer to work at another time, the club has access to the cottage whenever it wants so we can accommodate you. Please contact Ray Chase at enrpnr@erols.com for all details and if you plan to attend. Starting next month, at the suggestion of Steve Goulart, the *Broadcaster* plans to run a permanent column to keep the membership up-to-date on progress at InfoAge.

Al Klase reminds us that the Military Radio Collectors Association (MRCA) holds its fourth annual meet on September 17th and 18th at the West End Fairgrounds in Gilbert, Pennsylvania. Activities will include a swapmeet, field radio exercises, equipment displays and formal presentations. The event will be held in conjunction with the Red Ball Military Transport Annual Vehicle Rally. As Al says, "we get a double-dip of green radios and green trucks." Complete details are available at <http://www.milradio.org/> For more information about the MRCA, you can contact Al at skywaves@webex.net.



A Barrel of Fun - NJARC Treasurer Sal Brisindi searches for that elusive WD-11 at the bottom of a barrel of unknown treasures during last month's auction.

Ray also reminds us that it's time to get back to work on our program at InfoAge. An alarm system is being installed in cottage #2 and we need to begin thinking about establishing a public display of the National Broadcasters Hall of Fame collection. We also need to start organizing and cataloging the reference material that

tion with the Red Ball Military Transport Annual Vehicle Rally. As Al says, "we get a double-dip of green radios and green trucks." Complete details are available at <http://www.milradio.org/> For more information about the MRCA, you can contact Al at skywaves@webex.net.

THE JERSEY BROADCASTER is the newsletter of the New Jersey Antique Radio Club (NJARC) which is dedicated to preserving the history and enhancing the knowledge of radio and related disciplines. Dues are \$20 per year and meetings are held the second Friday of each month.

The Editor or NJARC is not liable for any other use of the contents of this publication.

PRESIDENT:

Phil Vourtsis
13 Cornell Place
Manalapan, N.J. 07726
(732)-446-2427

VICE PRESIDENT:

Richard Lee
154 Hudson Terrace
Piermont, N.Y. 10968-1014
(845)-359-3809

SECRETARY/EDITOR:

Mary Beeferman
2265 Emerald Park Drive
Forked River, N.J. 08731
(609)-693-9430

TREASURER:

Sal Brisindi
203 Cannon Road
Freehold, N.J. 07728
(732)-308-1748

SARGEANT-AT-ARMS:

Dave Snellman
Box 5113
New Britain, PA 18091
(215)-345-4248

TRUSTEES:

Ray Chase
Gary D'Amico (732)-271-0421
John Ruccolo (609)-426-4568

TECHNICAL COORDINATOR:

Al Klase
22 Cherryville-Stanton Road
Flemington, N.J. 08822
(908)-782-4829

TUBE PROGRAM:

Gary D'Amico
84 Noble Street
South Bound Brook, N.J. 08880
(732)-271-0421

SCHEMATIC PROGRAM:

Aaron Hunter
23 Lenape Trail
Southampton, N.J. 08088
(609)-267-3065

CAPACITOR PROGRAM:

John Ruccolo
335 Butcher Rd.
Hightstown, N.J. 08520
(609)-426-4568

WEB COORDINATOR:

Dave Sica
(732)-382-0618
<http://www.njarc.org>

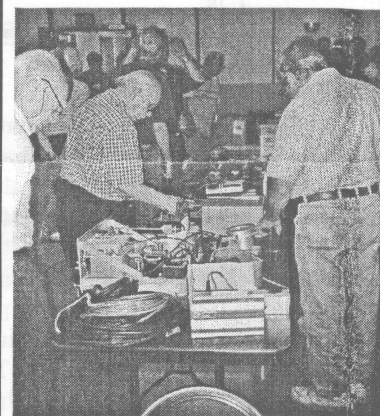
MEMBERSHIP SECRETARY:

Marsha Simkin
33 Lakeland Drive
Barnegat, N.J. 08005
(609)-660-8160

Of local interest is the club's next swapmeet on Saturday, July 31st at the American Legion Hall in Dover NJ. See this month's *Broadcaster* for all the details. We'll also be holding our next Repair Clinic at the Sarnoff Library a week before, on July 24th starting at 9:00 AM. If you plan to assist (mentors should show up at 8:00 AM) or bring a radio to be worked on, please contact Al Klase at 908-782-4829 or sky-waves@webex.net. Although not a requirement, pre-registration allows to club to get a feel for what to expect.



A beautiful Mackay 3010B marine radio - recovered for future generations by John Ruccolo.

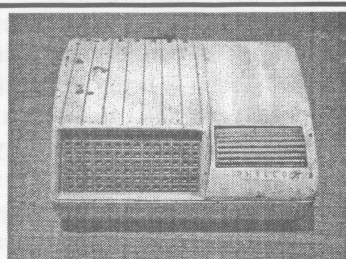


Auction fever.

PHOTO-OPS



A Mackay closeup.



Wouldn't you just know it? Last month's *Broadcaster* offered a feature article on a "rare" Philco 49-901. Club VP Richard Lee just "happened" to have one in his collection (yet to be restored).

Last month, I had the pleasure of meeting Dorothy Smith of Bayville, New Jersey whose husband Harry had quite a prestigious career in the electronics industry. Mr. Smith passed away a few years ago and Mrs. Smith wanted his electronic equipment and parts to go to a good cause. Some of the items that were auctioned at the June meeting will help us continue with the club's many projects; the remainder will be held for restoration projects and historical displays.

In a ceremony at Governor's Island, Mr. Smith was awarded the Marconi Memorial Gold Medal of Service for his outstanding contributions to the radio communications field and the United States Merchant Marine. As part of the event, Mrs. Smith told me that the biography that follows was delivered in code.

Although I was very happy to accept Mrs. Smith donation on behalf of the club, I was a little saddened that I wasn't able to meet Harry in person. Considering his career, I'm sure we would have had a lot to talk about...Ed.

Harry R. Smith, a native of New Jersey, was born in Newark and grew up in Glen Ridge where he attended the public school system from Kindergarten through High School. While in High School, he became interested in radio and obtained his amateur radio license with the call letters W2ERK. Graduating in the mid 1930's, he attended night school at RCA Institutes in New York City and obtained a first class broadcast license. He attended Cornell University while working as an operator of the University Radio Station WHCU in Ithaca, New York. He won the McMullen scholarship, graduated with a BEE degree in 1942 and went to work for the Western Electric Company as a radar field engineer.

During World War II, he was assigned to the U.S.N. Bureau of Ships and received training in the application of radar to submarines at the Naval Base in New London and in the interface of radar with naval guns at the Navy Fire Control School in Washington, D. C. He then was stationed for several years as a radar specialist in Panama and aboard the U.S.S. Dobbin, a destroyer tender in the Southwest Pacific area.

After the war, he worked for a few months at Bell Telephone Laboratories and then joined Allen B. Dumont Laboratories as a design engineer working on television camera chains and TV broadcast transmitters. In 1951, he left Dumont to become chief engineer for Standard Electronics Corporation in Newark, New Jersey, where he was responsible for the design, manufacture and installation of TV broadcast stations. Among the twenty odd TV stations that were installed under his supervision throughout the United States and Canada, the most noteworthy was WOR-TV, which was first located in North Bergen, New Jersey, and later moved to the Empire State Building in New York.

In 1960, after Standard Electronics Corporation was merged with R. E. L. in Long Island City, Mr. Smith joined Mackay Radio and Telegraph Company in Clark, New Jersey, (later became ITT Mackay), as Chief Engineer. In this capacity, he was responsible for the design, manufacture and installation of marine communication and navigation equipment on large commercial vessels. After 10 years as Chief Engineer, he became Manager of Product Planning, a position he held until his retirement from Mackay in 1982. Since then, he was active as a consultant in the field of Marine Electronics.

HARRY R. SMITH



Mr. Smith was a past member of the IEEE, the ION and the ARRL. He served for 15 years on the Executive Committee of the Radio Technical Commission for Maritime Services (RTCM) and was a member of the RTCM Board of Directors. He was also a Board member of the Comité International Radio Maritime (CIRM), a technical organization supported by the marine industry and headquartered in London, for 12 years and served 5 years as Vice President and 3 years as President of that organization. On three occasions, he was a member of the US Delegation to the International Maritime Consultative Organization (IMCO, now IMO), an international marine organization based in London and operating under the aegis of the United Nations. He has been awarded 22 U.S. and foreign patents in the fields of television and marine communications.

CONSERVING COPPER

By Marv Beeferman

It would probably be easy to trace the conservation timeline of raw materials for the war effort between 1941 through 1945 by just looking at the construction of radios during this period. Steel variable capacitors to save aluminum, wooden cabinets to save the chemicals that go into making plastics, and ultimately the ban on the production of any consumer radios. The importance of keeping the American public informed in a war environment took a high priority with the government and every attempt was made to ensure that at least a minimum number of broadcast receivers stayed in service.

In the early years of the war there was some optimism and it was thought that consumer radios could still be produced on at least a limited basis. From my files comes something called Copper Conservation Order M-9-c from the Director of Priorities of the Office of Production Management. Issued on Dec. 26th, 1941, it restricted the use of copper and copper-based alloys in the manufacture of radios.

Broadly speaking, after January 1, 1942, manufacturers were prohibited from using copper or copper-based alloys except for carrying electrical current. Only enough was allowed to be used to carry the amount of current required by the affected circuit while leaving a reasonable safety factor. All decorative uses of copper were also prohibited.

The following table was included with the order, showing its effect on certain parts of a radio where copper was previously used:

USE OF COPPER AND COPPER BASE ALLOY IN PARTS OF RADIOS

<u>PARTS OF RADIO</u>	<u>PARTS AS TO WHICH THE USE IS PERMITTED ONLY TO THE EXTENT NECESSARY FOR CARRYING CURRENT</u>	<u>PARTS AS TO WHICH USE IS ENTIRELY PROHIBITED</u>
Antennas	Wire & Contacts	
Automatic tuning unit	Wire & Contacts	
Cabinets		Cabinets
Coils	Wire & Contacts	
Current carrying lugs and ground springs	Current carrying lugs and ground springs	
Dials		Dials
Electrolytic condenser	Wire & Contacts	
Escutcheons		Escutcheons
High frequency cable shielding	High frequency cable shielding	
Hook-up & wire cables	Hook-up and wire cables	
Knobs		Knobs
Permeability tuning	Brass Screws	
Power & Radio transformer chokes	Wire & Contacts	
Resistors	Wire & Contacts	
Small paper condenser	Wire & Contacts, & Copper Foil	
Speakers	Wire & Contacts	
Sockets	Contacts	
Vacuum tubes	Vacuum tubes	
Variable condenser tuner	Wire & Contacts	Copper shafts
Vibrators	Wire & Contacts	
Volume controls	Wire & Contacts	

It's hard to tell how long this order stayed in effect, or, for that matter, if it resulted in any major changes in the production of radio parts for consumer use. It's difficult to imagine manufacturers expending the time and energy in the design changes required to meet these obscure copper conservation requirements after it was realized that only minimum restrictions would be placed on the materials that went into the production of military hardware. It probably would have been just as easy to supply the military with as many "crossover" parts as possible and retool for the rest, leaving a shrinking commercial radio market to fend for itself.

WHY IS MY STROMBERG-CARLSON ESCUTHEON SAGGING...AND WHAT CAN I DO ABOUT IT?

By Marv Beeferman

While thumbing through some of my old paper, I came across a series of service hints published as "Solder Nuggets" by Stromberg-Carlson (more accurately called the Stromberg-Carlson Telephone Mfg. Co. of Rochester, NY). Volume 3, Number 3 from August 15, 1939 caught my eye since the 400 series set that it was referring to had been sitting in my basement for...well, let's say a number of years... patiently awaiting restoration. It's here that I learned about Tenite, which Stromberg-Carlson used for its dial escutcheons.

Tenite (Cellulose Acetate) is a molded plastic developed by the Eastman Kodak Company and first produced in their Tennessee factories. Tenite has a number of properties which makes it a very desirable plastic for numerous applications. For instance, it has a very high tensile strength

and yet is sufficiently flexible to withstand bends and blows without breaking or cracking. (In the case of the prototype for the well-known Frisbee, perfect qualities. But the Tenite Frisbee couldn't pass the "brick wall test" without serious cracking and the material was quickly abandoned.) The plastic can also be produced in attractive colors and it feels soft and pleasant to the touch. Though it was initially considerably more expensive than other plastics, it was extensively used in automobile knobs and hardware and can be found radio bezels, grills, pushbuttons, knobs and occasionally in complete radio cabinets.

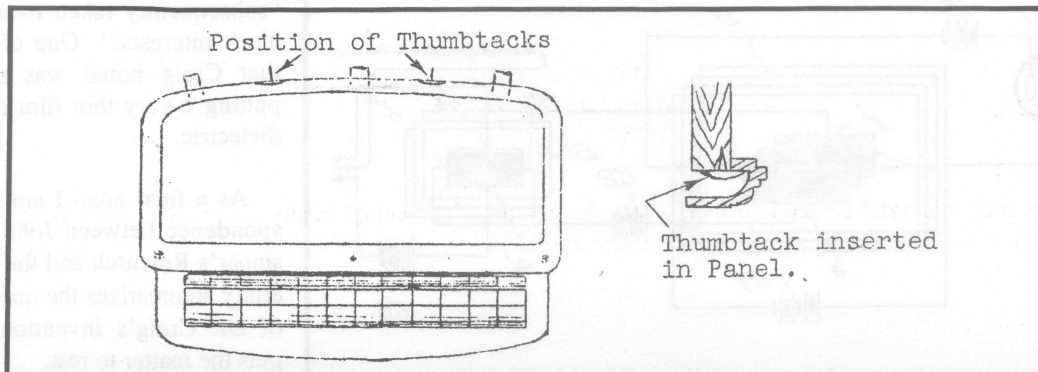
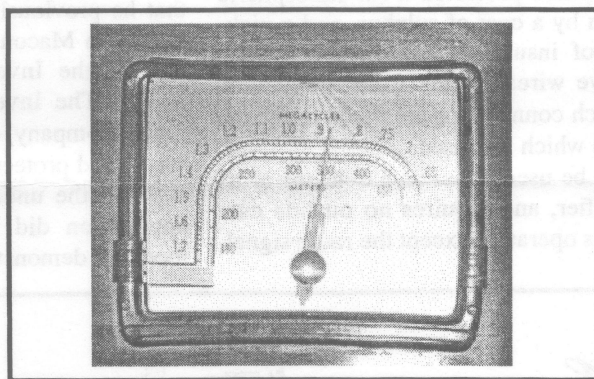
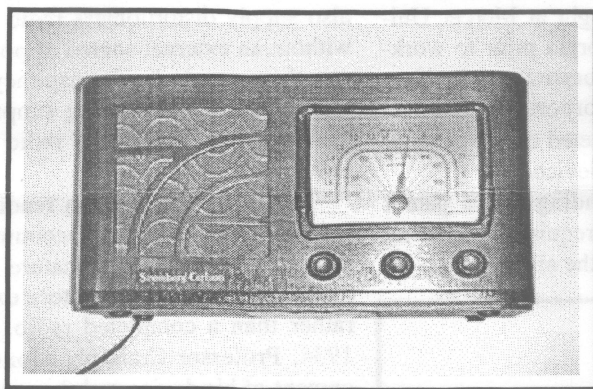
However, Tenite has one major drawback; when exposed to higher temperatures (even that from direct sunlight) for a sufficiently long time, it will soften and tend to sag and warp unless it is supported at frequent intervals. This is because Tenite is a thermoplastic which softens with heat as opposed to thermosetting Plaskon which hardens with heat as it cures. Tenite has also been known to shrink, generally fall apart, become a perfect medium for the growth of certain fungus and sometimes even develops a nasty, vomit-like smell.

On most of the Stromberg-Carlson model 400 series sets, the escutcheon is supported across the top by three spring clips. But to adjust the tuning on pushbut-

ton sets, the escutcheon must be removed by pulling it outward at the bottom and then pulling downward. Unfortunately, this bends the spring clips that hold it in place...exposure to the direct rays of the sun or heat from other sources will cause the escutcheon to sag away from the cabinet.

Stromberg-Carlson had an easy fix for this problem. Push two ordinary thumbtacks up into the cabinet so that the head projects about 1/16" on the outside of the cabinet. Then, when the escutcheon is put on, the head of the thumbtack will catch under the ridge in the escutcheon and keep it from sagging (see Figure below).

So what about my 400H with an unsupported escutcheon and all those other sagging examples? Although I haven't tried it to date, there may be a cure. Since Tenite softens between 120 and 200 degrees F, it seems that it should be possible to straighten my escutcheon by heating it in hot water and using a jig to hold it in the desired shape. I would still have to be careful, however...Tenite absorbs water so soaking for any length of time may prove disastrous. Perhaps a lab oven where temperature can be controlled may work better? Whatever method is pursued, perhaps I can offer a report on my results by next month.



BAD SCIENCE

By Marv Beeferman

The following article is based on various correspondence in my possession between Consumer's Research of Washington, New Jersey and reader's interested in press reports of a potential "revolution" in radio design....Ed.

Remember all those stories that used to circulate about a car that got 100 miles to the gallon but was prevented from being built by the big oil companies? Well, it seems that the automobile industry isn't the only business that holds a monopoly on urban myth. In 1932, the Hall effect proved fertile ground for a "tubeless" radio that could operate a speaker without any external source of power other than the incoming signal. As reported in *Popular Mechanics* magazine:

"BISMUTH PLATE DETECTOR AND AMPLIFIER ELIMINATES TUBES: Complete elimination of tubes and batteries is the claim made for a small device recently patented. It consists of a number of bismuth plates protected from atmospheric corrosion by a coat of sulphur, and a pick-up coil of insulated wire wound around them, five wires issuing from the device, with which connections are made to the receiver on which it is used.

It can be used either as a detector or as an amplifier, and requires no outside current for its operation except the radio signal.

It has been found by laboratory experiments that the device is about four times as sensitive as an 8-tube receiver. At the time of this writing, the device is not yet on the market and is therefore not available to the public."

What is being described as a bismuth plate detector is basically a crude Hall effect sensor. The Hall-Effect principle is named for physicist Edwin Hall. In 1879, he discovered that when a conductor or semiconductor with current flowing in one direction was introduced perpendicular to a magnetic field, a voltage could be measured at right angles to the current path. The initial use of this discovery was for the classification of chemical samples. The development of indium arsenide semiconductor compounds in the 1950's led to the first useful magnetic instruments utilizing the Hall Effect which measured DC or static magnetic fields. In the 1960's, the popularization of silicon semiconductors led to the first combination of Hall elements and integrated amplifiers. This resulted in the now classic digital output Hall switch.

The basis for the *Popular Mechanics* article was patent 1,822,129 (System and Apparatus Employing the Hall Effect) issued to Palmer H. Craig and dated Sept. 8th, 1931. All the background that could be found regarding Professor Craig was that he previously taught at Mercer University in Macon, Georgia prior to working for the Invex Corporation in New York. The Invex Corporation (Roller-Smith Company) marketed electrical measuring and protective devices.

With the understanding that a patent application did not require a working model to demonstrate the ability for an in-

vention to actually work, here is part of what Professor Craig claimed in his patent:

"Another object of my invention is to provide a construction of fixed rectifier for alternating current which remains in permanent adjustment and does not require resetting from time to time.

Another object of my invention is to provide a device for modifying electrical current of alternating characteristic for rectifying, amplifying or causing the generation of electrical oscillations of any selected frequency.

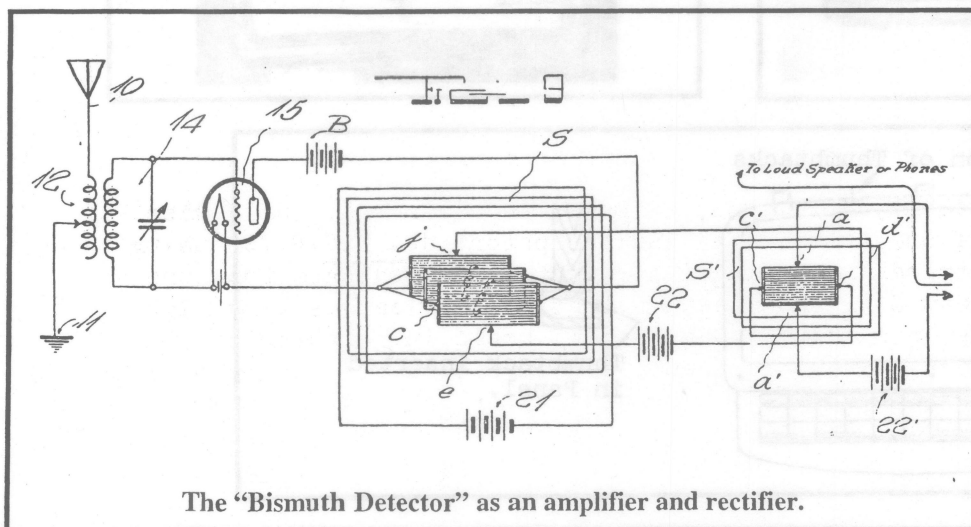
Still another object of my invention is to provide an electrical apparatus particularly adapted for operation in conjunction with the circuits of a radio receiving system for rendering feeble signal currents observable.

A still further object of my invention is to provide an apparatus unit which may be connected in circuit with electron tube apparatus for facilitating the operation of the electron tube apparatus in the reception of signaling energy."


Although the patent diagrams are very questionable, the popular press and general public was quick to pick up on these claims as a device that would eliminate tubes, batteries and power supplies and also supply distortionless radio reception without an external source of power. Nor was there any lack of conspiracy theories that the device was being suppressed by the large tube, battery and radio manufacturers.

The Invex Corporation readily admitted that "the newspaper accounts of (the detector) were rather premature inasmuch as the device was a laboratory experiment rather than a completed radio set." By 1934, Professor Craig abandoned development of his device and the patents were "subsequently taken over by large New York interests." One of the difficulties that Craig noted was the inability in putting a very thin film of Bismuth on a dielectric.

As a final note, I am including correspondence between John Hader of Consumer's Research and the IRE which generally summarizes the questionable nature of Dr. Craig's invention and hopefully puts the matter to rest.



The "Bismuth Detector" as an amplifier and rectifier.



THE INSTITUTE OF RADIO ENGINEERS

INCORPORATED

OFFICE OF SECRETARY

~~33 West 33rd Street~~

NEW YORK, N.Y.
330 West 42nd Street

TELEPHONE
PENNSYLVANIA
6-8746

IN YOUR REPLY
PLEASE REFER TO FILE
NO.

July 31, 1934

Mr. John J. Hader,
Consumers' Research,
Washington, N.J.

Dear Mr. Hader:

Mr. John M. Clayton of the General Radio Company has forwarded to me the material under your reference No. 339.4873 on the Bismuth Plate Detector.

The Institute as a body has made no investigation of this situation and, consequently, anything which is contained in this letter must be construed as being the personal opinion of the writer and in no way involving the organization.

Professor Graig, the inventor in question, has been an Associate member of the Institute since 1925 and in 1931 published a paper in our Proceedings. If the particular development covered in the patents forwarded with your letter were as revolutionary as the popular press indicated, it is highly unreasonable to expect that the inventor would not have taken the opportunity of publishing an account in our Proceedings. This would be a logical method of obtaining the substantial recognition which he would be deserving and engineering publicity which undoubtedly would improve his possibilities of making a satisfactory sale of the patents in question.

As in most popular accounts, there is a thorough mixture of fact and fancy. While it is probably true that the detector device itself can be operated without the assistance of power supplied from sources other than the incoming received signal, the patents fail to disclose the use of the device as an amplifier without two additional sources of energy. This seems quite reasonable in view of the fact that one would not expect to obtain more power from the output of a device than has been fed to it, thus going contrary to some fundamental laws of nature.

The radio patent, No. 1,822,129 makes no claim that the device gives highly sensitive operation. The earlier patent No. 1,778,795 using the device as an electrical measuring instrument would indicate from the curve appearing on sheet 3 of the drawings that the device has very high resistance and changes in current are extremely small in relation to changes in impressed alternating voltage. Of course, the two devices may be built on entirely different scales and that for electrical measurements may have entirely different characteristics as regards its output curve than the version employed for radio reception.

AUG 1 '34

Mr. John J. Hader

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It is stated that the sensitivity of these bismuth films varies inversely with their thickness so that very thin films are desirable. Thin films will have much higher distributed capacity than thick films and the by-passing effect upon radio frequency currents which must be passed through them may be substantial.

It is highly probable that there are a sufficient number of undesirable factors to the operation of this device which might require a tremendous amount of engineering to make it successful for employment in broadcast receivers. The magazine article is unquestionably misleading and probably too optimistic in its visions as to the possibilities of this development.

As I have had no personal experience with this development, all of my opinions are based upon the material which has been submitted by you and because of the complexity of the development it should be construed only as of suggestive value.

I am returning herewith the material in question in the hope that the above will be of some assistance to you.

Very truly yours,

Harold P. Westman
Harold P. Westman
Secretary

HPW:LC

Enc.

cc: John M. Clayton



New Jersey Antique Radio Club Antique Radio Indoor Swap Meet

Saturday, July 31, 8:00 AM (7:00 AM Vendor Setup)

American Legion Hall, Dover, NJ



NJARC presents its Summer swapmeet at the spacious, air-conditioned American Legion Hall in Dover, N.J. Spaces are guaranteed to the first 65 reservations. A \$5.00 buyer donation is suggested.

DIRECTIONS: From The East, North or South take I-80 West to Exit 35A (Dover). [I-80 West can be reached from the North via I-287 South or the Garden State Pkwy (South) or from the South via the N.J. Turnpike (North) to the Garden State Pkwy(North) to I-280 West] From the West, take I-80E to Exit 35 (Mt Hope, Dover). Follow Mt. Hope Ave. South, crossing Route 46 (where Mt. Hope Ave. becomes Bergen St.) and turn right on Blackwell St. Go to the third light and turn left on Warren St. Go two blocks, crossing the RR tracks. The Americam Legion is on the right (2 Legion Place).

RATES: NJARC members \$15/space; non-members \$20/space.

RESERVATIONS: Marv Beeferman, 2265 Emeraldal Park Drive, Forked River, NJ 08731 (609-693-9430). Phil Vourtsis, 13 Cornell Place, Manalapan, NJ 07726 (732-446-2427)

