Sidebands

The Newsletter of the EAST GREENBUSH AMATEUR RADIO ASSOCIATION

www.egara.club

January 2019

W2EGB Special Event Station Logs 160 Contacts

By Steve VanSickle, WB2HPR

Band conditions on December 1st were less than ideal, but EGARA's Special Event Station logged over 160 contacts as a team of nine members took to the airwaves to celebrate EGARA's 20th anniversary. Participating members used their own gear and the W2EGB call sign to make contacts on 75, 40, 20 and 10 meters between 2 pm and 6pm EST.

Dave Smith, WA2WAP made 77 contacts on 20 meters. He was followed by Steve VanSickle, WB2HPR, with 39 on 40 meters and Walter Synder, N2WJR, who caught 27 on 75 meters. Mike Sisno, KD2YWR, joined with Andy Sullivan, KC2WWJ, logging a total of 15 QSOs on 40 meters at Andy's shack. While 10 meters offered limited propagation, Dave Jaeger, K2DEJ made a yeoman's effort, but the ionospheric gods would have none of it! Tom Scorsone, KC2FCP, faced similar conditions during his late afternoon and evening shifts, finding the 40 meter band totally "shut down".

Some of the QSL cards received following the club's Special Event station. A custom designed W2EGB QSL will be sent back to each.

QST published the club's special event frequency as 14.340, but when Bryan Jackson, W2RBJ, began at 2 pm, he found the frequency in use by another special event station. He tried several other frequencies but only managed to score two contacts before his scheduled shift was over. Later, 20 meters opened up during Dave Smith's shift. In fact, most of his CQs were met with a chorus of call signs, or "pile-ups"! The 20 meter band deteriorated rapidly that evening and Nick Field, KD2JCR, was unable to make any contacts.

In This Issue

"I heard no stations – just static" Nick reported.

The 40 meter band served up its own challenges. "I began at 2PM, and the 40 meter SW broadcast QRM presented a real challenge – so I moved up to 7247.5 and during the second hour on 40, the band really came alive and pile-ups were numerous. It was a lot of fun!" said Steve, WB2HPR. As expected, the 75 meter band yielded QSOs with neighboring states.

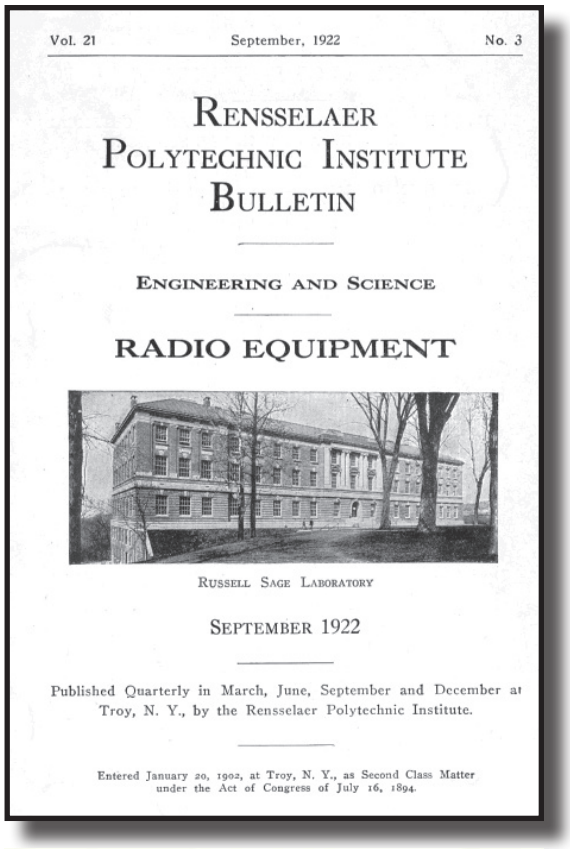
-continued on page 5-

January EGARA Meeting - January 9, 2019 @ 7 pm
Antenna Building

RPI Pioneered Radio Training in 1922

Steve VanSickle, WB2HPR, recently stumbled across a 1922 publication by the Renssealer Polytechnic Institute that promoted its AM radio station WHAZ and its courses in radio broadcasting and engineering. Today, WHAZ remains on the air, but is no longer owned by the school. Excerpts from the pamphlet make for some interesting reading and are offered here.

RADIO EQUIPMENT
ELECTRICAL ENGINEERING LABORATORY


Vol. 21 September, 1922 No. 3

RENSSELAER POLYTECHNIC INSTITUTE BULLETIN

ENGINEERING AND SCIENCE

RADIO EQUIPMENT

RUSSELL SAGE LABORATORY

SEPTEMBER 1922

Published Quarterly in March, June, September and December at Troy, N. Y., by the Rensselaer Polytechnic Institute.

Entered January 20, 1902, at Troy, N. Y., as Second Class Matter under the Act of Congress of July 16, 1894.

General - The various systems of radio communication now in use are the practical outcome of that scientific research in physics, chemistry and mathematics, which characterizes present day civilization. It is the task of the engineer to apply the results of this research to the problems of our every day life, such as the rapid transmission of intelligence from one point to another Realizing its obligation to supply technically trained men for this work, the Rensselaer Polytechnic Institute has, from time to time, found it necessary to make additions to its radio laboratory equipment. The latest addition is a radio telephone broadcasting equipment of the best type known to the art, which has been installed on the third floor of the Russell Sage Laboratory. It was designed primarily to give practical instruction in the operation of apparatus, the theory of which is studied in the classroom. This equipment is due to the generosity of Washing A. Roebling, '57, John A. Roebling, '88, and the late Charles G. Roebling, '71.

Popular interest in radio broadcasting has created a demand for diversified programs, and it is felt that engineering schools which require this type of apparatus for teaching purposes can assist in satisfying the demand of the public for broadcast entertainment by supplying programs of an educational nature. For this reason, this station, known by the call letters W H A Z, will broadcast every Monday evening at 8.15, Eastern Standard time, a program consisting of musical selections and addresses by men prominent in all fields of human activity.

As there is a large amount of research yet to be done in the field of radio communication, this equipment will be used for the collection of data on fading, interference, etc., in long distance, short wave communication. Tests of this nature have already been made by this station for the United States Department of Commerce. A short description of Station W H A Z follows -


FIG. 1. INTERIOR OF STUDIO

Studio - Figure 1 shows a corner of the studio. This room has received special acoustical treatment. The ceiling is covered with a thick layer of felt. One inch below this felt, suspended from the ceiling', is a perforated oil cloth covering. Sound waves passing through the holes in the oil cloth are quickly absorbed by the felt. The floor is covered with a heavily padded carpet. The treatment given the walls is somewhat different from that in the ordinary studio. The heavy curtains of friar cloth covering the walls are movable, thus permitting acoustical research and allowing the studio director a means of varying the amount of reverberation produced by the walls for different kinds of musical selections. A Steinway Duo-Art Reproducing piano and a Victrola are used for testing purposes. No mechanical instruments are used in the regular scheduled programs.

-continued on page 3-

Radio Pioneering at RPI in 1922

In the center of the photograph (Fig. 1) is shown a sensitive microphone which is used to pick up the sounds produced in the studio and transform them into feeble electric currents which are carried by wires to the amplifier in the operating room (Fig. 2).]'his microphone, mounted in a casing which minimizes the effect of mechanical vibration that might affect the clarity of the reproduced sounds, is designed to insure faithful reproduction of every gradation of tone of speech or music which is to be transmitted, and may be operated by talking close up or from a distance of several feet.

Fig. 2. General View of Operating Room

Operating Room-Adjoining the studio is the operating room shown in Figures 2, 4 and 5. This room contains the transmitting, receiving and recording apparatus used in both radio telephony and radio telegraphy. This apparatus is described more in detail under separate headings.

Speech Amplifier-Figure 2 shows a general view of the broadcasting section of the operating room. The wires from the microphone in the studio (Fig, 1) are connected to the speech amplifier which can be seen at the right of the operator's desk. This three stage amplifier increases the magnitude of the currents which it receives many thousand times and has been very carefully designed so that it can provide this tremendous increase of energy without any distortion of the original sound wave. The operator can manipulate this amplifier so that a proper amount of energy is produced no matter how loud or how soft the sounds in the studio may be. A loud speaker horn mounted next to the amplifier permits the operator to listen in while he is transmitting and thus determine the strength and quality of the signals sent to the radio transmitter.

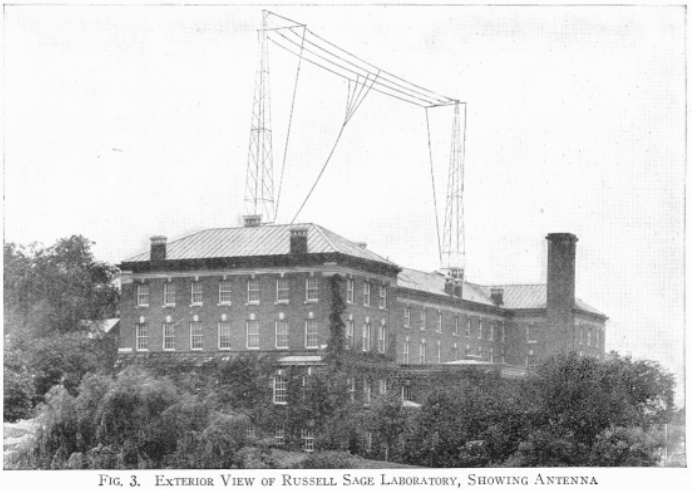


Fig. 3. Exterior View of Russell Sage Laboratory, Showing Antenna

Radio Transmitter-The radio transmitter is shown in Figure 2 at the left hand side of the operator's desk. This transmitter is used to produce high frequency electrical oscillations and vary their amplitude in accordance with the modulated current received from the speech amplifier.

The system used is generally known as the Heising modulation system and is similar in principle to that used so successfully in the transmission system of our common battery telephone exchanges. The electrical energy from the speech amplifier is fed into the grid or input circuit of a 50 watt amplifier tube. The output circuit of this tube is connected through a transformer to the input circuit of two 250 watt tubes connected in parallel, which together act as a modulator of the high voltage, high frequency oscillations. Two other 250 watt tubes connected in parallel are used as the oscillator. The modulator and oscillator are connected in parallel and then through a choke coil across a 1600 volt, direct current, supply system. The operation is as follows: When the speech amplifier is sending no energy to the radio telephone transmitter, the direct Current divides equally between the plate circuits of the oscillator and modulator, and oscillations of a constant amplitude are produced. When the speech amplifier is operated, it changes the grid potential of the modulator tubes in accordance with the variations of the sound waves. The variations in the grid potential vary the direct current through the modulator, and since the choke coil in the direct current circuit makes it practically ca constant energy supply, the variations in the direct current supplied to the oscillator must be equal and opposite to the variations in the direct current supplied to the modulator. Since the amplitudes of the oscillations are proportional to the direct current received by the oscillator, it follows that these amplitudes must vary in accordance with the variations of the sound waves falling on the microphone in the studio.

-continued on page 4-

RPI... (continued from page 3)

Four ammeters mounted on the face of the transmitter panel indicate to the operator the value of the current in the various circuits. Two control knobs just below the meters enable him to control the frequency of the oscillations and the amount of power radiated. Under normal operating conditions the high frequency power in the antenna circuit is about 500 watts. The wave length is measured by the Kolster wave meter which is visible on the left hand side of the desk (Fig. 2). At the present time Station W H A Z uses a 400 meter wave for broadcasting its regular programs.

Power Supply-The power is supplied to the radio transmitter by a motor generator set. The driving motor is a 5 1/2 H.P. 110 volt direct current machine, direct connected to two direct current generators, one a 16 volt machine used to supply the filament current and the other a 1600 volt machine used to supply the plate current.

Power Control--This motor generator set is controlled at the panel shown at the extreme left of Figure 2. A remote control automatic motor starter is actuated by means of a push button. The voltage of both generators, when once properly adjusted, is controlled by the motion of one knob.

Monitoring System-On the right hand side of the operator's desk, (Figure 2) is shown a Western Electric receiving set, consisting of a detector and a two stage audio frequency amplifier. This is used with a loud speaker or telephone head set to enable the operator to listen in on the output of his transmitting set as it leaves the antenna. This receiver is automatically connected with the antenna when the transmitter is not in operation, and is then used to listen in on the programs of other stations and thus prevents unnecessary interference.

Antenna System-The antenna, which is shown in Figure 3, is supported by two steel towers 80 feet high and 150 feet apart, placed on the roof of the Russell Sage Laboratory. This roof is 64 feet above ground level, is made of sheet copper and electrically connected at many points to the water pipes and steel frame of the building. The cross-arms or spreaders are made of galvanized iron pipe 18 feet long, guyed to the steel towers to prevent swaying in the wind. The antenna. is of the T type. The horizontal part consists of four stranded conductors 125 feet long. The lead-in wires are attached to the center point of the horizontal wires and come down in the shape of a fan to a point 30 feet below the horizontal wires where they arc formed into a cable. This cable is led into the operating room through a large porcelain bushing (Fig. 2) and ends on the center point of a single pole, double throw antenna switch. The ground connection is made from one pole of this switch to the water pipes, steel frame and roof of the building. From the other pole of this switch the antenna wire runs directly to the coupling coil of the radio transmitter, and then to the ground connection. The energy is transformed by this coil from the oscillator to the antenna circuit from which it is radiated into space.

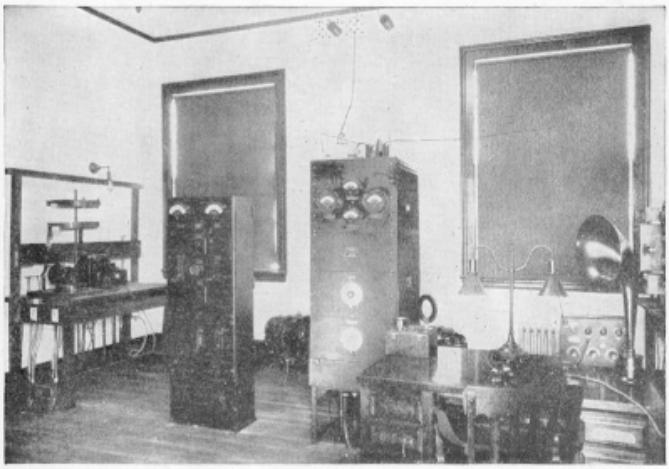


Fig. 4. View of Operating Poom Showing Spark Telegraph Set at Left

Radio Telegraph Transmitting Equipment-Other transmitters are employed for experimental and relay work using the call letters 2 X A P and 2 C D C. At the extreme left of Figure 4 is shown a 1 kilowatt spark transmitter using a 15,000 volt transformer and a non-synchronous rotary gap. In the background of Figure 2 is shown a 100 watt continu0us wave telegraph set employing the Colpitt's circuit. This set may also be used as a 50 watt telephone transmitter for local work. It is supplied with 1000 volts direct current obtained by means of two Kenotron rectifiers from a 60 cycle alternating current line. The high power telephone set can be used as a continuous wave telegraph transmitter when necessary. Plans are now being perfected for the construction of a 1000 watt continuous wave transmitting set using the master oscillator circuit. This set will be used in transcontinental and transatlantic tests.

Receiving Sets-Several different receiving sets arc in use at present.

Figure 5 shows a second operator's desk with a Paragon receiver and a two stage amplifier. There is also a long wave receiving set and a 6 tube short wave receiver using three stages of radio frequency amplification.

-continued on page 9-

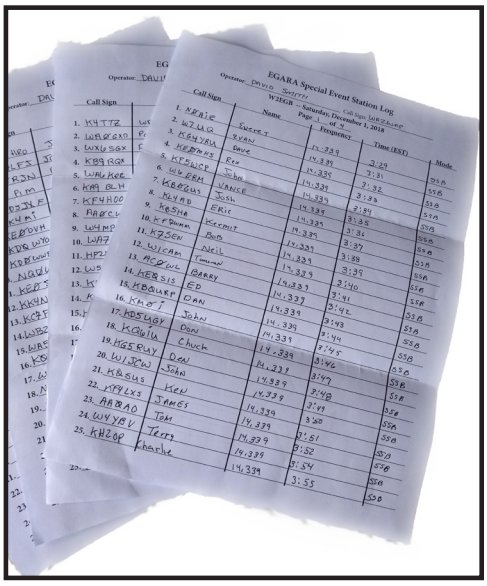
Special Event Station Makes Contacts Nationwide

(continued from page 1)

Walt stayed on 75 past his assigned shift, to scare up a few more contacts until conditions deteriorated late in the afternoon. Mike, KD2YWR took the afternoon 40 meter shift, under the guidance of Andy, KC2WWJ and Russ Greenman, WB2LXC, keeping the band alive until 6PM.

It was a new experience for Mike to use the HF bands, and he is enthused about upgrading his license. Mike's efforts added 15 contacts to the W2EGB log sheet (including VE3JMY in Quebec), -- and he gained valuable operating experience at the controls.

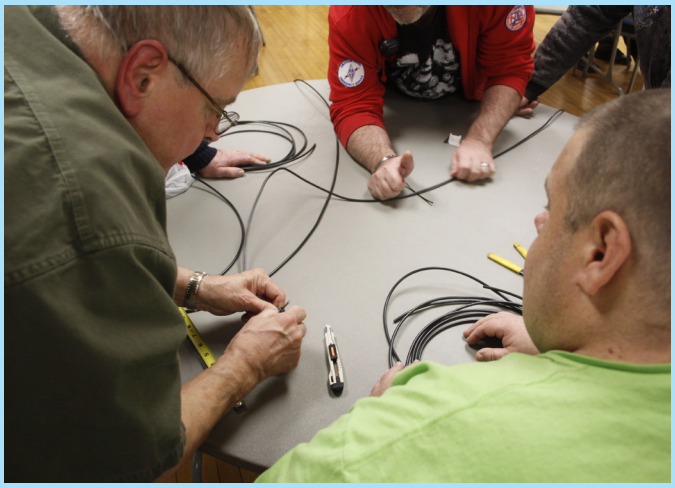
Considering the band conditions during this period of low sunspot numbers, the W2EGB team of operators did a tremendous job in making our Special Event station a huge success. It was also an excellent opportunity for members to "tune" their operating skills and tell the story of EGARA. Many hams congratulated the club on its two decades of service to Amateur Radio and community service. A total of 160 contacts were made throughout the country, with 41 states and one Canadian province logged – from Alaska to Florida, and Maine to California! Special commemorative QSL cards will be sent to all of the stations that request them.



Dave Smith, WA2WAP, scored the most contacts during the W2EGB Special Event Station, with a total of 77

Thanks to all the members of the W2EGB special event team, with special thanks to Nick, KD2JCR for conceiving the event, and to Bryan, W2RBJ for his planning, scheduling, and QSL design.

Antenna Building Workshop Set for January Meeting



Steve VanSickle, WB2HPR, demonstrates how to make correct measurements for antenna elements during a past workshop

EGARA's January meeting will feature a hands-on antenna building workshop, with the opportunity for members to construct VHF and UHF ground plane radiators. The club will provide materials at no cost.

"These types of antennas can greatly enhance the coverage provided by 'rubber ducky' types that come with most hand held radios," said Steve VanSickle, WB2HPR. "They're particularly useful during community events where operators might be located over a wide area. Using better antennas can also allow radios to operate in simplex, avoiding the need for a repeater."

Plans will be shared to build ground plane antennas that serve the 144, 220 and 440 bands.

EGARA December Meeting Minutes

- The December meeting of the EGARA was the club's traditional Christmas Party and was called to order at approximately 7:00 PM by President Tom Scorsone, KC2FCP;
- Club officers offered holiday greetings to all and distributed free raffle tickets to each in attendance;
- Treasurer Bryan Jackson, W2RBJ, gave a brief update on the club's finances and announced that 2019 dues will remain the same at $15 per individual and $25 for a family membership. He also reminded everyone that dues can be paid online through the club's website;
- Aard certificates were distributed to those members that had accumulated ten or more points by attending meetings and participating in club events. The awards may be redeemed for gift cards, VE exam sessions or discounts on club dues;
- Secretary Steve VanSickle announced that the January meeting will feature an antenna building workshop (see story on page 1);
- Steve also congratulated Dave Smith, WA2WAP, for making the most contacts during the club's Special Event Station on December 1st, with a total of 77;
- Following the holiday dinner, the raffle was held and an HT Tri-Band radio was won by Jim Pendolino, KC2HRO. Other raffle gifts included ARRL antenna books and a Christmas turkey, won by Mike Sisno, KD2YWR;
- The holiday dinner concluded at 9 pm.

-de Steve VanSickle, Secretary

No Increase in 2019 Dues

The New Year is just about here and once again the club will hold the line on its annual dues, with individual memberships at $15 and family memberships at $25.

"I'm pleased that we are able to keep our dues at the same levels they've been for the past few years," said club Treasurer Bryan Jackson, W2RBJ. "And when you consider everything the club provides, it's a deal you just can't beat."

In addition to supporting the club's programs, dues are used to cover the costs of its website, newsletter, refreshments, materials for projects like the antenna building party, and activities like Field Day.

To make it convenient for members, dues can be paid during a club meeting, securely on-line through the club's website, or by mail. Checks should be made out to "EGARA." Payments made by mail should be addressed to: Bryan Jackson, EGARA Treasurer, 983 Sterling Ridge Drive, Rensselaer, NY 12144.

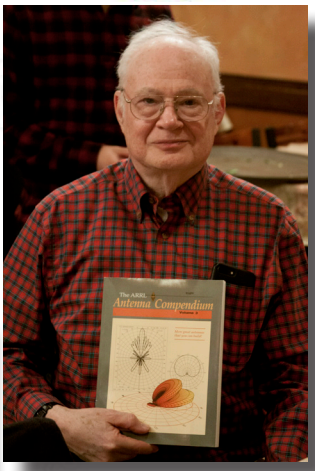
Dues must be paid no later than March 31st for members to remain in good standing and to vote for officers in April.

Pay Your Dues Online @ www.EGARA.club/dues

On the Beam
News & Notes

Santa Brings Gifts to the Club's Annual Christmas Gathering

Several club members apparently made it onto Santa's "good" list this year and were rewarded with gifts at EGARA's Christmas Party held at Moscatiello's Restaurant. Here's a galley of the evening's friendship and fun.



The History of Ham Radio:

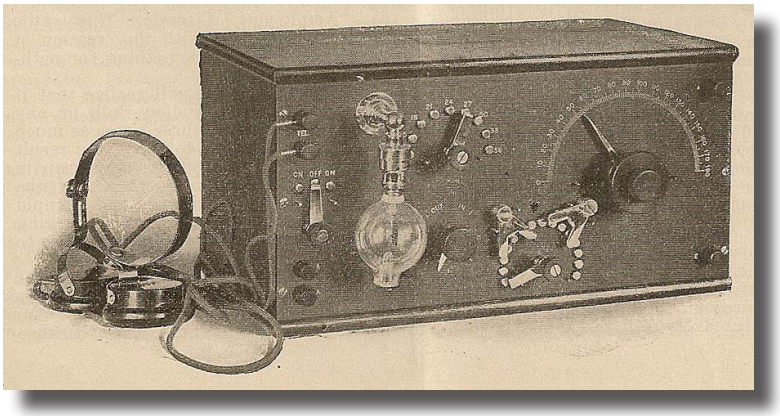
Chris Codella, W2PA, author, John Pelham, W1JA, editor, Phil Johnson, W2SQ, editor

(Editor's note: By special arrangement with the authors, Sidebands is pleased to present this multi-part series on the history of ham radio. Subsequent chapters will be published in future monthly editions of the newsletter)

Vacuum tubes revolutionized radio, changing it more than any other single invention. When first introduced, however, even the scientists and engineers working with them did not fully understand how they worked. One of the first tubes to appear in QST was the Audion, by DeForest. Although it had been introduced back in 1905, it was expensive and amateurs did not begin to use it until seven years later, when 22-year-old Edwin Armstrong demonstrated its practical use as a regenerative detector.

In the very first issue of QST, tucked in the back on page 22, a teaser stated that the next issue would be "a wonder," containing, among other things, information on the newest technology, the Audion detector. So in January 1916, Tuska published the lead article, "The Oscillating Audion," about using a vacuum tube as a detector. For "the technical" of the "valve," he referred the reader to Armstrong's writings where the principles of regenerative reception were presented in full.

The idea, he explained, was to combine an incoming signal with the signal of oscillation in the tube, producing an audible beat note. Lacking a fundamental understanding of why it did what it did, he took an experimenter's approach and advised operators to play around with the adjustments until they found the right settings to receive signals. He reported that signals from professional stations over 5,000 miles away had been received by an east coast ham using the Audion.



DeForest RJ-6 with front-mounted Audion

As hams began to experiment with the Audion, the QST editor asked for anyone experienced with it to send in details for publication. The March editorial claimed that 90% of amateurs did not know how to use it properly. As an expensive luxury, hams could not afford to be burning them out, as was the tendency. It was widely known, however, that the most effective stations were using Audion detectors. Some hams were even using them to receive continuous wave signals, considered a potentially important development in radio should it be shown to be practical, despite the DeForest company disapproving the use of the Audion this way.

Perhaps answering this call for help, the lead article in the same issue (March Radio Bulletin) was, "Practical Pointers on the Audion," written by A. B. Cole, electrical engineer and Sales Manager at the DeForest Radio Tel. and Tel. Co. It was the first authoritative paper about vacuum tube technology to appear in the magazine. Filling four full pages, complete with a picture of the author, the article was the longest yet to be published in QST.

Cole devoted four paragraphs to establishing his credibility as an authority, while yet a true member of the amateur radio community. His opening sentence stated that his purpose in writing was "not to sell Audions but to assist those who use the justly famous Audion to obtain the best results." Maybe he thought it necessary to write this because his sales title was in the by-line, but he probably also intended to attract more buyers despite this disclaimer.

He professed to want to set the record straight, asserting that much had been written in error about the Audion "without authority of the patentees." Although he had been working professionally in the field, he considered himself an amateur radio pioneer, having been active since 1904, experienced with the Audion since 1908, and was firmly an amateur "at heart" (whereas, he claimed, many commercial radio types were known to "look down" on amateurs). He also admitted that despite extensive experience with Audions, he did not "know it all," unlike many less experienced authors, in his estimation, who nevertheless seemed able to write whole books on the subject. No two Audion "bulbs" were exactly alike, he explained (implying a lack of control in the manufacturing process), and therefore it required careful circuit design and especially careful layout to get good results from them. (continued on page 10)

A Look at WHAZ in 1932...

There is in course of construction an 11 tube superheterodyne receiver which will be used for Ion g distance tests. A western Electric "push and pull" amplifier is used wherever a portable amplifier is required.

Short Wave Antenna-For 200 meter communication a 6 wire cage antenna is provided. This is 100 feet long and is almost vertical, being supported by the same towers which support the long wave antenna. Both antennae are usually left in place as they do not materially interfere with each other. Each tower is, however, provided with a set of pulleys and a windlass so that the entire antenna system can be changed in a few minutes when this is desired for special tests.

Switching-In order to provide flexibility in operating the different sets, remote control switches mounted on the ceiling are so arranged that any receiving or transmitting set can be instantly connected to or disconnected from either of the antennae.

All the transmitting sets are operated by the same transmitting key and the same remote control changeover switch. The receiving sets can be switched to a loud speaker located in any part of the building or to anyone of several recording devices.

Recording Equipment-On the table at the left of the receiving desk in Figure 5 are shown two models of the Poulsen telegraphone. This is an old invention adapted to a new purpose. By means of this device, speech and music from a distant transmitting station are electromagnetically recorded on a spool containing six miles of fine steel wire. The record is then clearly reproduced as often as desired and erased at will. It can be amplified for reproduction in a loud speaker and could be rebroadcast by the radiophone if desired. The telegraphone is also used to record programs transmitted by VV H A Z or words spoken into the telegraphone itself. This instrument records radio telegraph signals and when these arc reproduced they offer an ideal opportunity for code practice as everything is recorded, including interference and static. The reproduction can be made faster or slower than the original. Experiments have been made with different methods of operating relays by radio signals, and a device has been constructed for counting up the number of dots in the Arlington time signals and ringing a series of bells with the twelve o'clock dash.

Historical Equipment-In the Electrical Engineering Laboratory are operating models of the various types of radio equipment used in the past. One of the original singing

Fig. 5. View of Operating Room Showing Receiving and Recording Equipment

arc telephone sets, made by the DeForest Company, is shown on top of the apparatus case in Figure 2. I t is interesting to note that this small piece of apparatus performing, the same function as the modern broadcasting equipment shown in the same illustration. Next to it is an early Marconi, coherer type, radio telegraph receiver. In an adjoining room are two complete Telefunken radio transmitting and receiving sets.

Future Development-The apparatus now installed, and under construction, in the radio section of the Electrical Engineering Laboratory, is the logical outcome of the most recent experimental and research work in radio engineering. As the field of radio communication develops, new devices will be added to keep the laboratory equipment at the forefront of progress.

Ham It Up!

The Audion (continued)

According to Cole this was one reason the company did not sell them separately from the complete detector. (It's fair to assume that they also made more money on the detector than on the Audion alone.) Moreover, removing the Audion from the detector, as many apparently did for experimentation, caused the guarantee to be "immediately dissolved." He cited an example of an amateur who had installed one in his own cabinet, could not get it to work after substituting parts, blamed it on the Audion, and sent it back. The company discovered it to be in perfect working order when used in the proper detector.

There were two grades of Audion: S and X. S was the regular grade, having passed a test of sensitivity to weak signals when compared with a standard, the most sensitive crystal detector available. X grade bulbs were ones that exhibited significantly higher sensitivity than the standard. Between one and ten percent of a production run might be designated X grade. Cole claimed that this method of testing using a practical receiving situation was more meaningful than "theoretical" testing, which he oddly defined as inferring performance solely by measuring terminal characteristics. He also stated that the DeForest company's chosen testing apparatus consisted of standard amateur equipment so as to not bias the results by using equipment specially designed for the Audion. This appears to contradict his previous statement about the need for great care in designing such circuits, but it may be that he simply meant standard, properly designed, amateur equipment.

The four most common troubles with Audions all stemmed from wiring batteries improperly or using batteries that were too depleted, wrote Mr. Cole.5 The fifth had to do with lack of sensitivity at long wavelengths (above 1500 meters), which was attributed to inefficiencies in the typical tuner, not the Audion itself (of course). The batteries were designated as A (the grid supply), B (the plate, or wing, supply, and is the reason why B+ is commonly used to mean plate voltage), and the lighting battery for the filament. It was sometimes necessary to reverse the polarity on the lighting battery to get the circuit to work, though no reason was given in the article. Perhaps no cause was known to Cole or the company.

A tuner was properly operated by adjusting the voltages for maximum weak signal sensitivity while listening. The objective was to first obtain some zero-signal background sound (hiss), then back off on the filament to extend the Audion's life while leaving it set at a critical point of maximum sensitivity.

Some fallacies needed correcting, he wrote. You cannot use a detector bulb to build an amplifier—they are entirely different functions. You cannot operate detectors in excess of their ratings in order to get more gain (as an amplifier) or for other purposes; you'll just burn them out faster. Thus, after establishing his credentials as a true amateur, he proceeded to discourage experimenting—the very essence of amateur radio—at least as far as the Audion was concerned.
DeForest RJ-6

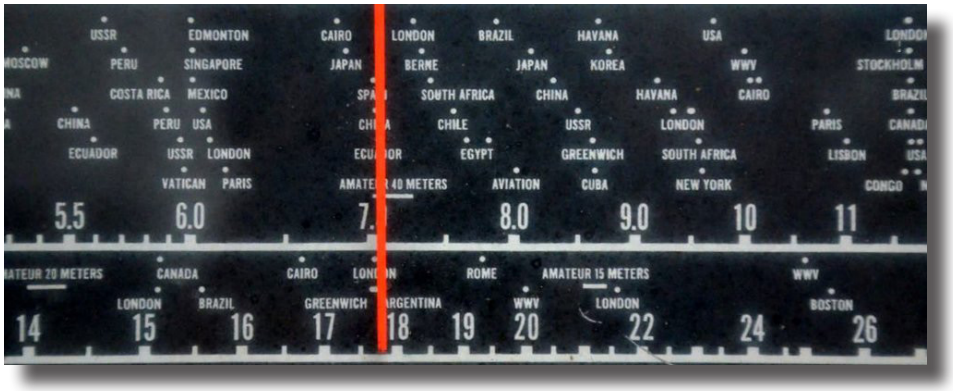
The article included a picture of a DeForest RJ6 Receiving Set. It had four controls, and the Audion bulb was mounted on the front panel on the outside of the cabinet. As the center of attention (after all, it was the single active element) this mounting scheme permitted the operator to watch it glow and adjust the filament visually.

Later in the same issue, a half-page ad from The Wireless Mfg. Co., DeForest's company, appeared for the first time. Big, bold letters announced "A New Receiving Set," a complete receiver based on the Audion. It claimed to be the lowest priced high quality set ever offered for sale. A full page ad by DeForest Radio Telephone and Telegraph Co. of NYC also appears in the same issue. Their RJ8 model sold for $25 and the RJ9 for $14,6 both without a B battery (batteries not included!). The main improvement was the replacement of the high voltage step-switch selector with a potentiometer, an improvement called for in the previous month's article.

Two months later, Cole wrote a short follow-up article, "An Audion Hint," in which he described how to make a high value resistor with paper, pencil line and rubber block, to serve as a high-resistance leak between plate and grid to prevent temporary "paralyzing" of the Audion due to static discharge at the antenna.

Picking up where Cole and Tuska had left off, Paul Godley of the R.C.A. wrote the first in-depth article about circuit design with the Audion,being one of the first to explore its use on short wavelengths.7 Filling nearly eight pages, Godley methodically presented receiving circuits of increasing complexity, ranging from the one-tube simple regenerative detector up to a four-tube receiver that employed three steps of audio amplification and interstage transformers—ignoring with gusto Cole's admonition against using the Audion for anything other than detection. Godley would later play an important role in the development of the short waves and equipment for using them.

January: This Month in Radio History



January 1, 1902: Nathan Stubblefied demonstrates natural conduction telephone in Murray, KY - 1983: ARPANET switches from NCP to TCP/IP1 - 1997: EAS rules go into effect

January 3, 1929: Paley incorporates Columbia Broadcast System - 1983: Time magazine names the computer the "Machine of the Year"

January 4, 1923: WEAF and WNAC conduct first wired simulcast

January 5, 1932: The Shadow debuts on CBS - 1940Armstrong demonstrates FM to the FCC - 1979: FCC eliminates Third Class operator requirement for stations - 1838: Morse Code privately demonstrated

January 6, 2004: First IBOC radio receiver commercially sold in Cedar Rapids, IA

January 8, 1918: President Wilson 14 Points speech aired worldwide - 1927: Commercial transatlantic telephone service inaugurated between New York and London - 1993: NRSC OKs RBDS standard

January 9, 1943: Nicola Tesla dies - 1958: John Tukey coins term "software" in American Mathematical Monthly

January 10, 1987: NRSC-1 goes into effect to establish AM emphasis/de-emphasis curves

January 12, 1949: Claude Shannon proves mathematics of Nyquist Theorem - 1995: FCC designates 2.31 to 2.36GHz for S-DARS use

January 18, 1983: First GUI/mouse computer, the Apple Lisa, unveiled.

January 19, 1943: FCC endorses Restricted Radio Operator Permits

January 20, 1920: Ernst Alexanderson granted US patent for magnetic amplifier - 1965: DJ Alan Freed credited with coining the term "rock and roll" dies & Jan. 20 named DJ Appreciation Day) - 2000: FCC creates LPFM

January 24, 1984: Apple introduces the Macintosh 128K

January 25, 1915: The first Intercontinental telephone call - 1964: USA launches second communications satellite, Echo 2

January 31, 1958: U.S. launches its first satellite, Explorer

CALENDAR

January 5, 2019 - FCC Exam Session - 10 am East Greenbush Library.

January 9, 2019 - EGARA Membership Meeting, Antenna Building Party, masonic Temple @ 7 pm.

May 11, 2019 - Annual EGARA Hamfest, East Greenbush Volunteer Fire Department - 8 am to 1 pm.

Pro Tip: Connectors

Besides the obvious, such as having the right number of pins, there are several things to consider when choosing a connector:

Cost: Nobody wants to spend more than they have to. But using the cheapest connector you can find may not, in the end, be cost effective if it fails to do its job.

Ruggedness: Is it going to be plugged and unplugged once a year, or ten times a day?

Environment: Will it be exposed to the weather, such as on an outdoors antenna? How about salt water, such as on a boat? Will it be subject to vibration, such as on a machine? Is someone likely to step on it?

Signals Type: Is it for power and ground? For analog or digital signals? If analog, what frequency? Is it audio or RF? If digital, what clock speed or bit rate?

Power Level: If it's for power, is it for 24 Volts? Or 240 Volts? Or 2,400 Volts? Will it carry 0.25 Amps? Or 2.5 Amps? Or 25 Amps? Higher currents require larger, thicker pins. Higher voltages require more insulation.

Signal Level: Is it for 2 Volt signals or 2 microVolt signals? Will the current be 5 milliAmps or 5 microAmps? Connectors used for very low signal levels (so-called "dry circuits") often have gold plated pins.

Second Sources: Is it a standard type of connector available from many manufacturers, or is it available only from one company?

For Sale

MFJ-464 Morse Code Reader/Sender - Sends and Reads 5-99 WPM, Large 2-line LCD shows send/receive messages, single or Iambic paddle or computer keyboard operation (***keyboard included***). volume controls, 4 message memories, Adjustable Weight and Sidetone, Speaker, RFI Proof. New condition. List is $199.99. Sell $149.00.

Kenwood TS-690S Transceiver - Excellent condition - Covers 160 to 6 meters, all modes, 100 watts. Comes with manual, power cord, microphone. Outstanding performance and audio. One of Kenwood's best. $600.00.
Contact Bryan at W2RBJ@outlook.com

Speco Dual Trace Scope, FS-4820, 20 Mhz: New probe kit. $50.00.. Good clean condition.

RCA Senior Volt Ohmyst WV98C: Oldie but Goodie, Volt Meter. $45.00. Will entertain offers.

UHF Receive Pre Amp: 1 input and 3 outputs, 430 to 490 Mhz. Works well, Don't know specs. $12.00
Contact: radiowizzz@aol.com, John Maddalla, WB2HZT

Arrow Model 52-S4 - 4-Element 6 Meter Yagi antenna in good condition. $75.00 See: http://www.arrowantennas.com/solid/52-4s.html for details.

MFJ Model 989C Antenna Tuner - legal limit, very little use, in immaculate condition. $225.00 -- Originally sold for $359.00 See: https://www.universal-radio.com/catalog/hamtune/1332c.html
Contact Steve at: svansick@nycap.rr.com

A-99 10/11 meter antenna -will need help to take down. $50.00 or trade for better 6meter antenna.
Contact Dave, WA2WAP, at 518-4381016

Looking to Buy, Sell or Swap?
Send your info to W2RBJ@outlook.com

The East Greenbush Amateur Radio Association

Organized in 1998, by Bert Bruins, N2FPJ, (SK) and Chris Linck, N2NEH, the East Greenbush Amateur Radio Association, an ARRL affiliate, is committed to providing emergency services, educational programs, and operating resources to amateur radio operators and residents of the Capital Region of New York State. The club station is W2EGB. The club also has several VHF and UHF repeaters open to club members and the public.