The History of Ham Radio

Parts 1 and 2: From the birth of the wireless age to 1920.

By Eric G. Schalkhausser W9CI, SK

When trying to get just a glimpse of wireless history in a nutshell, it is traditional to lay most emphasis on the years from 1910 and on. This period coincided with radio rules and regulations, the three R's, being formulated by the United States government. We then project the general accumulation as far as 1927–1928, after which time some degree of order was again established in the radio industry, overall.

In telling our story, it is impossible to refrain from making pertinent insertions of interest. There were many occurrences during those early years that stand out vividly in memory and need telling. Those beginning years were mostly of pioneering and exploring, bringing forth many discoveries and inventions in rapid order, in very short periods of time.

1909

To begin with, let me set the year 1909 as a reference. Why 1909? We will become aware of the reason as we review the history in relating the *magic that is wireless.*

Adapted from *73 Amateur Radio,* March and April 1977, where portions of this were originally reprinted from *QCC News*, a publication of the Chicago Area Chapter of the QCWA.

And it sure was magic to everyone in those days, believe me! Let me take a short glimpse into the past history of wireless. There were no laws on the books. There were no rules or regulations pertaining to wireless. The general public was not even aware that radio waves existed. They had no inkling of what was meant by communicating without wires. Practically nothing was known about electricity. All this was a mystery.

1888

In 1888, just 89 years ago [in 1977], a German scientist made a discovery when he sensed that there was something present in the vicinity of an electrical spark in a Leyden jar discharge. This elementary discovery made by Heinrich Hertz set the stage for many scientific investigations. They were carried on in university laboratories, stimulating research in the field of electromagnetic waves.

1892

About this time, along came Marconi from Italy. He was born in the year 1874. At the age of 18, while a freshman at the University of Bologna, Marconi discovered that an electric discharge from a condenser could be detected. This made possible the transmission and reception of signals over some distance. Playing around and experimenting for four years, he finally went to England, where he demonstrated his finding and equipment.

1896

In 1896, Marconi obtained a British patent for *wireless telegraph apparatus using electricity.* How utterly novel and primitive that description sounds today. And that was only eighty-one years ago [in 1977]! (At that time I was 3 years old, but do not recall the incident!)

1897

Within a year, commercial interests became aware of the possibilities in the application and use of Marconi's invention and organized the Wireless Telegraph and Signal Company, Ltd., in England.

1899

In 1899, Marconi and his assistants succeeded in sending signals across the English Channel with their crude equipment. The main bottleneck was their iron filing coherer for detection of signals. The use of galena, silicon, or carborundum was not yet known for

Form 765 Provisional. Number 14120

LICENSE FOR GENERAL (General or restricted) AMATEUR RADIO STATION

DEPARTMENT OF COMMERCE
BUREAU OF NAVIGATION
RADIO SERVICE

Pursuant to the act to regulate radio communication, approved August 13, 1912,
E. G. Schalkhausser, *a citizen of the State*
of Nebraska, *having applied therefor, is hereby granted by the Secretary of Commerce, for a period of* one *year, on and subject to the restrictions and conditions hereinafter stated and revocable for cause by him, this License to use or operate the apparatus for radio communication (identified in the Schedule hereinafter) for the purpose of transmitting private radiograms or signals, notwithstanding the effect thereof extends beyond the jurisdiction of the State or Territory in which the said station is located: Provided, That no interference other than may result under the restrictions contained in this License shall be caused with the radio communication of stations of the Government of the United States or licensed stations.*

2. The use or operation of apparatus for radio communication pursuant to this License shall be subject also to the articles and regulations established by the International Radiotelegraphic Convention, ratified by the Senate of the United States and caused to be made public by the President, and shall be subject also to such regulations as may be established from time to time by authority of subsequent acts and treaties of the United States.

3. The apparatus shall at all times while in use and operation be in charge of a person or persons licensed for that purpose by the Secretary of Commerce, and the operator of the apparatus shall not wilfully or maliciously interfere with any other radio communication.

4. The station shall give absolute priority to signals or radiograms relating to ships in distress; shall cease all sending on hearing a distress signal; and shall refrain from sending until all the signals and radiograms relating thereto are completed.

*5. The station shall use the minimum amount of energy necessary to carry out any communication desired, and the transformer input shall not exceed ~~one-half~~ one kilowatt.**

6. The station shall not use a transmitting wave length exceeding 200 meters.

7. The station shall not use a transmitter during the first 15 minutes of each hour, local standard time, whenever the Secretary of Commerce by notice in writing shall require it to observe a division of the time, pursuant to the Twelfth Regulation of the act of August 13, 1912.

8. The President of the United States in time of war or public peril or disaster is authorized by law to close the station and cause the removal therefrom of all radio apparatus, or may authorize the use or control of the station or apparatus by any department of the Government upon just compensation to the owners.

9. The Secretary of Commerce and Collectors of Customs or other officers of the Government authorized by him may at all reasonable times enter upon the station for the purpose of inspecting and may inspect any apparatus for radio communication of such station and the operation and operators of such apparatus.

10. The apparatus shall not be altered or modified in respect of any of the particulars mentioned in the following Schedule except with the approval of a radio inspector, or other duly authorized officer of the Government. 11—4900

*Strike out "one" if the station be within 5 nautical miles of a naval or military station; otherwise strike out "one-half."

Photo A. *1912 provisional license.*

detecting wireless signals. In this same year, the Marconi Wireless Company of America was established.

1900

At the turn of the century, the English co. changed its name to Marconi Wireless Telegraph Company, Ltd., to be more in keeping with current developments.

1901

In 1901, Marconi and two of his engineers came across the Atlantic to set up their wireless equipment in Halifax, Newfoundland. They succeeded in receiving messages across the waters from a station transmitting out of Poldhu, England. All this on very long wavelengths, since the shorter ones were still undiscovered. By this time, many ships at sea were installing transmitting and receiving equipment and many shore and inland locations had established communication centers.

1902

By 1902, a great deal of interest was shown in the application of this relatively new phenomenon. Gradually, better detecting devices were invented and larger stations were erected in Europe, America, and other countries. One should call attention to the contributions made at this time by Sir J.J. Thompson, a British scientist, who had discovered the electron, enclosed in a vacuum tube. It was a sequel to Edison's invention of the light bulb.

1904 and 1906

This led to the development of the use of vacuum tubes in detecting wireless signals, where J.A. Fleming in 1904 and Lee DeForest in 1906 made their contributions. While the sagas of the sea kept the newspapers busy and the public talking of the great wonders of wireless and its possibilities, what do you suppose was going on among the younger scientists across the country, especially in the eastern part of our United States? All of these intriguing possibilities of radio did not just belong to commercial companies — *by no means!*

Here we digress a bit and look into the back rooms and woodsheds around the country, taking note of the enthusiasm and the influence that wireless had produced among the young. We need to find out what was going on in these areas, since this part of early wireless history is vital in following the progress of the new discovery.

1909

This brings me to the year 1909, previously referred to. While the commercial

2

SCHEDULE OF STATION AND APPARATUS

Name of owner, E. G. Schalkhausser *; Age,* 22

Location: State, Nebraska *; County,* Johnson

City or town, Sterling *; Street,* H. L. Academy *; No.* - -

Official call, "9 A H O"

Name of naval or military station, if within 5 nautical miles, - - -

Power: Transformer input, 500 *, W.**

Antenna: Type (T, ⅂, fan, umbrella, etc.), "T"

Height, 55 ft. (Above ground) *; Horizontal length,* 80 ft.

Wires: Number in vertical part, 1 *; In horizontal part,* 4

The normal sending and receiving wave length shall be 200 (Not exceeding 200) *meters and the station is authorized to use the following additional wave lengths, not exceeding 200 meters:* 175 *meters,* - - - *meters.*

This License expires on May 4th, *191*7.

EDWIN F. SWEET,
Assistant Secretary of Commerce.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Delivered by [signature]
(Radio inspector)

Place, Cleveland, Ohio. *, Date,* May 5th, *, 1916.*

MJB/ *Not to exceed 1,000; or if the station be within 5 nautical miles of a naval or military station, not to exceed 500. 11—4900

Photo B. *Schedule of Station and Apparatus.*

interests considered wireless in terms of their restricted domain, we find a group of "wireless kids" in New York, no more than ten in number, all in their teens, getting together and forming a Junior Wireless Club on January 2, 1909.

They were putting together metal plates, wires, and iron filings, making their own coherers, winding coils and other paraphernalia, and succeeding in sending dots and dashes according to the Morse code, between their homes, from block to block, and even across miles. They were listening in to what was going on, hearing the messages floating around between ships and shore stations. This was real fascination!

1910

Naturally there were bound to be conflicts developing, especially between the commercial companies and the "interlopers." Interference occurred and became objectionable for "the big boys." So in the following year, 1910, the existing problems were brought to the halls of Congress, to find ways and means to regulate wireless communication and define domains. True, the ether was free space and belonged to everybody, but the commercials and their interests sought to have vested right in their use of this "free" space. Thus, the conflict ...

The conflict was brought to a head in the introduction of two bills, one in the House and one in the Senate. House Bill #23495 and Senate Bill #7243 were introduced. The senator strongly in favor of these bills was none other than Chancy Depew of New York, which was the bailiwick where the interlopers were operating. The contents of the bills were strongly against any use of the airways by anyone except the commercials. The teenagers with their homemade equipment and their determination, organization, and above all, their spirit, had other ideas. They wrote a letter to Chancy and told him so. Here we note something which will be of interest to all of you. The boys of the Junior Wireless Club had a meeting, selected their representatives, and asked to have a hearing in Washington. They composed another letter to Chancy Depew, were granted a hearing, and on April 28, 1910, were given the privilege of presenting their case. Believe it or not, these boys won their right to go on experimenting as they had done before. This Junior Wireless Club had performed like veterans in the halls of

Form 762

AMATEUR APPLICANT'S DESCRIPTION OF APPARATUS

DEPARTMENT OF COMMERCE
BUREAU OF NAVIGATION
RADIO SERVICE

The following form of description of apparatus will be filled out and forwarded in duplicate to the radio inspector by each applicant for an amateur's license for apparatus for radio communication of the general or restricted class (amateur applicants for a special license will use Form 761). The inspector, if necessary, will then arrange for the inspection of the station.

The information is desired primarily as the basis of the description of the apparatus to be inserted in the license, but many of the details are desired to facilitate the classification and particularly the inspection of stations, and will not, of course, be incorporated in the license. This form will not be open to public inspection.

NOTICE.—This form must be submitted in duplicate to the radio inspector in the applicant's district.

I. GENERAL DESCRIPTION OF STATION.

Name of applicant, Prof. E.G. Schalkhausser Age, 28

Place of birth Hillside (City or town.), South Dakota (State, Territory, or foreign country.)

Address, Sterling Nebraska.

Citizen of the State of Nebraska or a company incorporated in the State of

Location of station: State, Nebraska; County, Johnson;

City or Town, Sterling; Street, M.L. Academy; No.

Station to be operated by E.G. Schalkhausser (Name.) holding operator's license No. , grade,

issued by (Name and title of examining officer.), (Date.), at (Place.)

Name of naval or military station, if within five nautical miles of the station for which a license is desired, none.

II. POWER SUPPLY.

From city mains, generator, storage battery, etc., From city mains. 110 volts A.C.

Give following data, measured under normal sending conditions, key depressed:

Amperes, 3-3 (Measured in primary circuit of transformer or induction coil.) A. Volts, 110 (Measured across transformer or induction coil primary terminals.) V.

Power, (Transformer input in watts.) W. Transformer or induction coil rated at 500 W.

Description of oscillation transformer and transmitting condenser: spiral-wound, loose-coupled.

18 ft. heavy brass ribbon in primary; 30 ft. heavy ribbon in secondary.

Additional information: condenser of glass plate type, oil immersed.

III. ANTENNA.

Type (T, L, fan, umbrella, etc.), aerial is of 'T' type.

Dimensions:

Maximum height above ground, 55 feet. Total length (from apparatus) 90 feet.

Horizontal length, 80 feet. Vertical length, including lead-in, feet.

Number of wires in horizontal part, four In vertical part, one

Separation between wires, 30 inches feet. Length of ground lead, 25 ft. feet.

Ground lead connected to water-pipe running 7 ft. under ground to well.

Other essential dimensions, aerial is 55 ft. above ground at one end and 35 ft. above ground at the other end.

Is series condenser used in antenna for transmitting? no.

Additional information:

Furnish sketch of antenna, with complete dimensions

11—4872 (OVER.)

***Photo C.** Amateur Applicant's Description of Apparatus.*

congress, and to them and many others went the freedom of the ether for many years to come.

1911

So in 1911, the enthusiasm on the part of radio amateurs grew tremendously. In the same year, the Junior Wireless Club changed its name to the Radio Club of America, which it remains to this day. The members became notables in wireless. The club was held in very high esteem, especially after their confrontation with Congress and their display of courage and dedication for a cause dear to their hearts and right in principle.

By 1911, every wireless company and operator on ship and shore knew that regulations were a necessity to hold down interference in radio communication. An act, dated June 24, 1910, authorized by our Department of Commerce, Bureau of Navigation, became what at that time was considered the law of the land regarding radio transmission and reception. This act consisted of four sections, all very general, and was labeled An Act to Require Apparatus and Operators for Radio Communication on Certain Ocean Steamers.

1912

On July 23, 1912 (two years later), and then only pertaining to section one of the four sections, the act was amended, spelling out some specific details concerning operators and ships at sea. From then on, all transmitting stations would have to apply for a license to operate. The law was not too specific. It had loopholes, and many inland stations, especially amateur radio enthusiasts and experimenters, went about hooking up induction coils and going on the air with call letters assigned by themselves. For instance a "one inch" spark coil was considered to be limited to no further than eight or ten miles, and so did not fall within the law for crossing state borders! What a "primitive" concept of wireless in those days. The type of signal coming from these amateur-operated coils did not conform to any known bandwidth or frequency standard. A signal was "just a signal."

At this time, a number of wireless organizations blossomed. Notable among these were (1) The Institute of Radio Engineers, (2) The American Radio Relay League, and (3) The National Amateur Wireless Association. Up to this time there was very little literature or published information available. It did not take long for these to appear. Soon small companies issued store catalogs offering everything from loose couplers to crystals and crystal holders, headphones, and all sorts of gear to get the amateur started. Enthusiasm ran high. Wireless was a newfound discovery and appealed to the young as well as to the old. Wireless could be used to span great distances and for so many experiments. The fascination of distant communication without wires was gripping and overwhelming.

1914

Hiram Percy Maxim was one individual

who could come up with the right ideas at the right time, and the ARRL was his heritage. No sooner had this enthusiasm caught fire when World War I broke out in Europe in 1914.

1917

The conflict went on for several years and, sure enough, the United States became involved in 1917. All radio amateurs received notices to dismantle their equipment. Many joined the services in one capacity or other, many into the Signal Corps, where their training and experience as radio operators was greatly appreciated by the government.

During the hostilities of World War I, in which the United States was involved from April 1917, to November 1918, there were no amateur activities on the air. After the armistice was declared, amateurs still had to wait almost a year before permission was granted to dust off the old equipment, make repairs, catch up on the many changes to be made due to advancements in the art, and become active again.

It is interesting to follow the trend in activities among amateurs during the lull due to the war. *QST*, the publication of the Amateur Radio Relay League, continued to appear every month until September 1917. Then followed increased government restrictions, rather severe. The edict: "No radiation, no ground connections, no capacity or inductance to hook-up!" Amateurs were told, "You may read radio books, think radio thoughts, and learn the Morse code, until the call comes to join up." Many amateurs enlisted in the Signal Corps or the Navy, or found employment with the services.

1918

Although the armistice was signed on November 11, 1918, amateurs waited some months before radio publications were again available. The first postwar edition of *QST* appeared in July 1919, and other periodicals made their appearance, notably *Wireless Age* and *Radio Amateur News*. Restrictions on amateur transmission

IV. GENERAL INFORMATION.

Normal wave length used in sending 200 meters. Other wave lengths, ____ meters.
Note.—In many cases two or more waves are simultaneously radiated from the transmitter. Care must be taken that no wave exceeds 200 meters in length.

Normal day communicating range with similar station No power during day. miles.

Give location of stations with which communication is carried on:

No. 2701 O St. Street. Distance, 35940 mi. Owner, H.H. Smith
No. ____ Street. Distance, 10 Owner, Lyle Francis
No. ____ Street. Distance, ____ Owner, ____
No. ____ Street. Distance, ____ Owner, ____

Additional information: ____

April 20 1916
(Date submitted by applicant.)

Prof G Schalkhauser
(Signature of applicant.)

INSTRUCTIONS TO RADIO INSPECTORS.

Please send out this form in triplicate, one for the applicant's files, if he desires.
When filled in and returned, fill out the following:

Received by ____

at ____ Date, ____

Date of inspection (if inspected) ____

Licensed as {general / restricted} amateur station.

Serial No. ____

Date of issue, ____

Signature of Inspector, ____

The inspector will then retain a copy for his file, and forward the form to the Commissioner of Navigation, to whom the inspector should also submit a special report before issuing the license if he be in doubt on any matter concerning it.

11—4672

***Photo D.** An apparatus description, one of the required parts of getting an early ham ticket.*

were removed by the government on October 1, 1919. Here it should be noted that an attempt was made through the introduction of a bill, known as HR 15159, requested by the Secretary of the Navy, to turn over all radio control to the Navy Department. This bill received very strong opposition from the amateur radio fraternity and was defeated.

What were the regulations which now governed the radio amateur? All licenses were canceled as of April 1, 1917. Rules and regulations had to be

***Photo E.** The station of 9AHO.*

JUNIOR WIRELESS CLUB, LTD.

EACH MEMBER MUST HAVE MADE HIS OWN STATION.

W. E. D. Stokes, Jr., Its President—Headquarters at the Ansonia Contains Much Apparatus—Club to Go to Washington to Oppose Pending Bill.

It is somewhat dangerous to attempt to enter the clubroom and experimental station of the Junior Wireless Club, Ltd. without a guide, for the officer in charge dispenses with the necessity of lock and key by having the knob charged with electricity to give the unexpected—and unexpecting—visitor what he terms a "nice little shock."

But when proper guidance is secured from the club's young president, who maintains headquarters at his home, many other things more or less electric add to the effect. A big electric turning lathe occupies one side of the room, numerous vari-colored models of aeroplanes—which the manufacturer asserts really go when wound up—hang from wire complexities overhead, zinc plates, worse than they look, are not to be ignored.

In fact it is not safe to put a hand to the most innocent looking object unless first reassured. A big box beneath the battery and motor table filled with perfectly staid appearing earth and plants which thrive on the rays of a makeshift sun specially arranged out of a 100 candle power electric bulb is not what it would seem. Those plants—roots, branch, leaf or blossom—are electrified and emit sparks when invited. On the side walls high and low, on the ceiling and suspended therefrom, bulbs of every conceivable variety, shape and power transstations and steamers with wireless equipment.

These steamers and signal stations are all intimately acquainted with the experimental station of the Junior Club—too much so at times, it seems, when the Manhattan Beach station has to ask it to stop receiving for a time, for the Manhattan Beach station is less powerful and is retarded in receiving.

The young president puts the receiving headgear on your head.

"Listen," he says. "They're talking to Manhattan Beach."

"How can you read it?" you ask.

"Listen," he says. "The sparks da-da-da-da-da—can't you hear it?" And he becomes a trifle impatient at your stupidity. He discusses condensers, detectors, sensitive points and other appropriate topics for your enlightenment, but you are a poor subject.

Then the president tells how the Junior Wireless Club came to be, how it operates and what it intends.

About two years ago the Junior Aero Club, under the direction of Miss H. L. Todd, participated in the toy exhibition held at Madison Square Garden. Three of these youthful members, Frank King, Faitoute Munn and Frederick Seymour, specialized on wireless telegraphy and frequented Miss Todd's studio on West Twenty-third street to experiment. Each of them made his own wireless apparatus and through the newspapers they invited any other boy to come and show a mechanical act he had made himself.

W. E. D. Stokes, Jr., then aged 11, had rigged up a wireless outfit which he brought forth to display and which Frank King helped him set up. Such books as the "A. B. C. of Wireless Telegraphy" and "Electricity of Everyday Life" and possibly, the random assistance of a random electrician were the principal sources of information.

The father of W. E. D., Jr., met the boys and invited them to his home to form a club. There the Junior Wireless Club, Ltd., came into being with headquarters at the Ansonia, there being just enough offices to go around among the charter members. W. E. D. Stokes, Jr., was made president; George Kite, 41 West Forty-seventh street, vice-president; Faitoute Munn, East Orange, N. J., recording secretary; Frank King, 136 West 105th street, corresponding secretary; Frederick Seymour, East Orange, N. J., treasurer. Miss H. L. Todd was made honorary president. Prof. R. A. Fessenden of Brant Rock, Mass., was chosen consulting engineer, and Sprague, Seligman & Mofcrath, 71 Broadway, as general solicitors and patent attorneys. Even from the start the club's letterheads presented a complete and dignified appearance and are as yet unchanged, although the club has extended its membership to thirteen.

At 10 A. M. the first Saturday of each month from October to May the club holds meetings at the Ansonia, goes through the regular preliminary business acts on the business letters received and the applications for membership, talks over schemes and, most of all, works with the wireless. The necessary qualification for membership is that the applicant has himself made his own wireless apparatus. Later he may have assistance and more elaborate mechanical contrivances, but the first rule is inviolable.

They first memorize the Morse code until they are able to think in dots and

W. E. D. STOKES, JR., AND HIS WIRELESS TELEGRAPH.

the Ansonia, many marvels and intricacies may be observed with some degree of security. W. E. D. Stokes, Jr., president, aged 11 years, points out the pitfalls.

"Look out. Don't step on that wire plate!" says he. "It's charged!" And you look out and don't step.

The clubroom and receiving station is imposing, almost formidable despite its somewhat small extent. In addition to the wireless telephone instruments at one side of the windows, the sending station across the way and the aerials connecting with three conduits above form the little room into an Aladdin cave of brilliancy.

"I'm always looking around at bulbs," says the president, "and when I see a new kind I try it."

So there they are, long and slim, short, fat and round, but all shining and bringing out dazzlingly the blueprints of scientific aspect which adorn one side of the wall, posters of the Postal Telegraph and Cable Company variety, illuminated letter placards bearing such legends as "No Smoking," "S. W. Co."—Stokes Wireless Company—and last but not least printed lists of wireless signal

Photo F. *This article appeared in a New York City newspaper early in 1910. The boy in the picture is the first president of the Junior Wireless Club, later renamed the Radio Club of America.*

1919

Applications for amateur radio operators and station licenses soon had the fraternity by the hundreds back into the swing. The spark coil, the rotary gap, and the old receivers had to be brought up from the basement or down from the attic, unpacked from storage bins, and put back into service. As soon as restrictions were removed, activity started with a vengeance. Radio shops blossomed everywhere. The old wireless bug put everybody to building loose couplers, variometers, honeycomb coils, simple detectors, and a host of new devices. Along came the newly developed three-element vacuum tube. Here was the beginning of the real revolution in reception and transmission of wireless signals. The VT-1 by Western Electric gave the amateurs their first chance to analyze its possibilities. There also were Morehead and Marconi tubes available, but they were very unstable as receiving as well as transmitting units. No two alike would respond equally in a circuit. We were all looking for the advent of larger and more powerful vacuum tubes, and anxious to replace the old spark transmitter. The amateurs knew that it was possible to do away with the noisy spark discharges with their interference problems due to wide bandwidths, and put a new kind of signal into the ether using vacuum tubes.

At ARRL headquarters in Hartford, Connecticut, where *QST* originated and where our newly appointed secretary and editor, K.B. Warner, took over right after the war, it was decided that the entire body of amateurs be organized into local and regional clubs and associations. The objectives were to foster and promote complete control of all ham activities such as relaying messages, to establish relay routes across the country, and to keep abreast of all governmental legislation pertaining to amateur radio activities.

K.B. Warner, the ARRL's new secretary, came from Cairo, Illinois. A very active amateur, he operated under the call 9JT in 1915, using a 1/2 kW fixed-gap transmitter.

followed to go back on the air. Amateurs knew that the Department of Commerce still had complete jurisdiction with William Redfield, Secretary of Commerce, at the time. A publication issued by the Bureau of Navigation, Radio Service, dated August 1919, entitled "Radio Communication Law of the United States," indicated that no additional radio regulations had been added to those in effect as of the beginning of hostilities. In fact, no changes were made in the radio law during the interim between the introduction of the Act of June 24, 1910, and the ratification of the International Convention of Communications, finalized and signed by Woodrow Wilson, then president of the United States, on July 8, 1913.

All amateur radio stations were supposed to be operating on the 200 meter assigned wavelength. Adherence was not too strictly enforced. In fact, some stations were operating well above 200 meters. A few, with special permission, were well into the 375 meter range. So little was known about radio propagation that the erroneous assumption persisted that "the longer the wavelength, the greater the distance waves would travel." The August 1920, *QST* said, "For short wavelengths (below 200 meters) the signal strength is a function of the wavelength, and it may be said that the shorter the wavelength, the weaker the signal." *How strangely the ether waves behaved in those days!*

Everybody was still using interrupted CW, some straight, some quenched, with the only noticeable difference being in the pitch, the whine, and the characteristic interruption of the dots and dashes. Some found satisfaction in a 500 cycle note, if a 500 cycle generator could be found as the prime source of power. Interference created bedlam in many areas, especially before midnight, after which most of the spark coil operators quieted down and went to bed, giving the high-powered boys the ether. The maximum power transformer rating was one kW, usually a Thordarson or Clapp-Estham or equivalent rated at 25,000 volts secondary. The law was specific: "A transmitting wavelength not exceeding 200 meters and a transformer input not exceeding one kilowatt." The ammeter hot wire in the antenna usually was asked to register from 4 to 10 amperes into an L- or T-type antenna configuration. It had to be designed and built to a measured length, specifically not over 100 meters, to be within the law. There were plenty of parallel wires, usually at least four, to form a ground network of copper conductors (or buried copper washboilers) for a counterpoise.

The amateurs had a standby pal, "The Old Man," delivering pertinent information to all through articles in *QST*. He kept all in good humor and within the straightjacket of operating procedures. As an example of what could be expected from the OM, here

Photo G. *As soon as radio became popular as a hobby, equipment began appearing on the market. Note the flamboyant style of the copy, typical of the period. This ad appeared in 1915.*

is an excerpt directed to the editor from the June 1919, *QST* under the heading "Rotten Starting":

"I am sending you a specimen of a *Wouff Hong* which came to light out here when we started to get our junk out of cold storage. Keep it in the editorial sanctum where you can lay hands on it quickly in emergency. We will be allowed to transmit soon and then you will need it."

Who does not know the *Wouff Hong?*

What most of the amateurs surmised and expected was just ahead. We read in November, 1919:

"There will come a day when amateurs will not need to bother their heads about government or commercial stations, but THAT DAY HAS AS YET NOT ARRIVED. The radio millennium has still to come. We mean by this that with our present form of crude apparatus still in vogue, and when we are using quasi makeshifts, we cannot

Photo H. *Issued in January 1917, this certificate was one of the first of the "awards" that hams have always displayed with pride on the walls of the shack.*

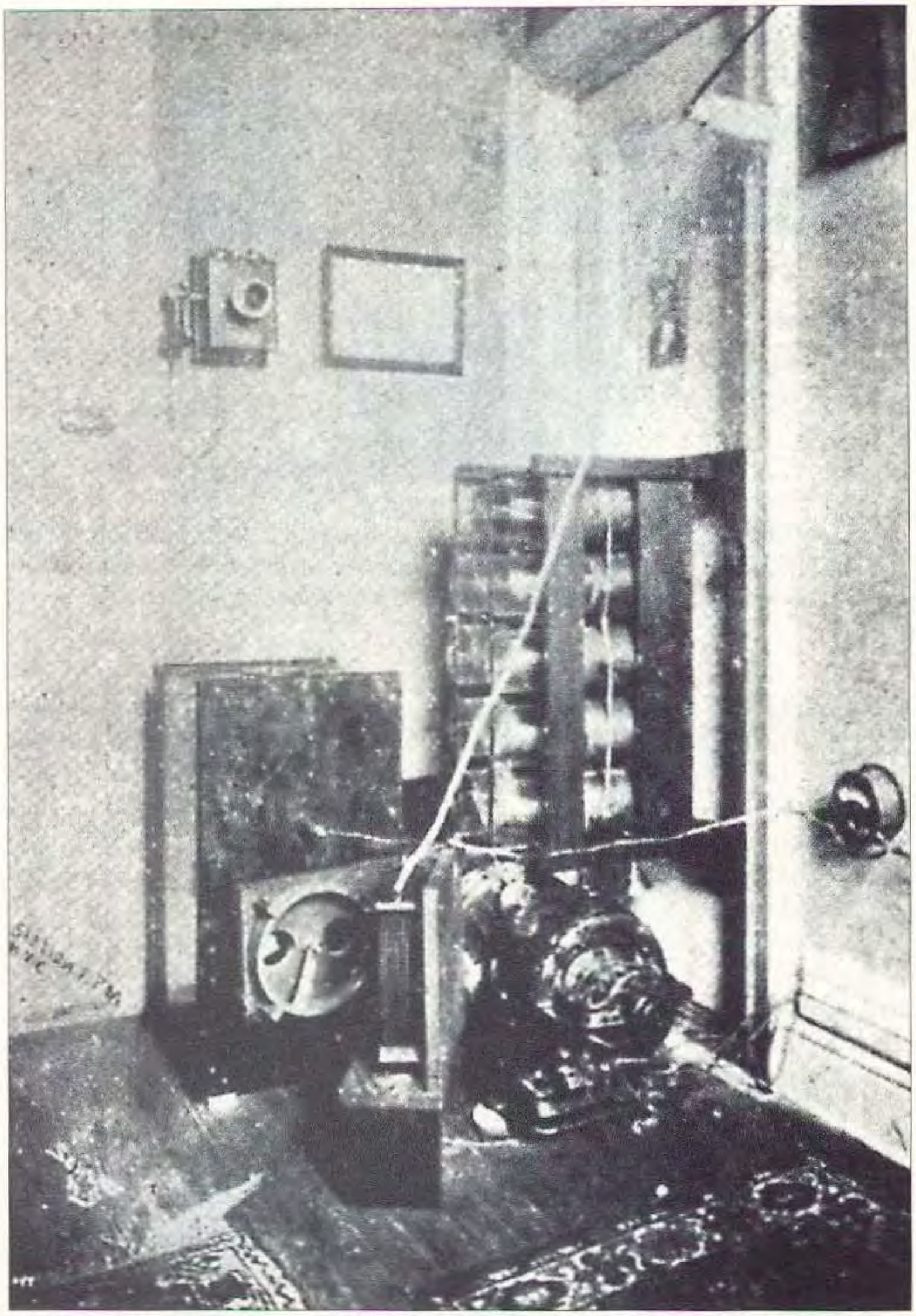

Photo I. *The transmitter station "2PM", which produced the first transcontinental signals.*

expect that we can tune our transmitters down to within the hundredth fraction of a meter. Usually the amateur wave is so broad that it can be picked up all over the scale. As long as we persist in sending out such waves, we must expect criticism from the big stations with which we interfere."

The junking of the radio spark gap was in the making. To actually let go was another thing. Some of the old-timers in 1920 complained that there was no romance in tube transmission—that it has no individuality or traditional associations like the old spark. There was always a certain stalwart and hearty attraction about the old non-sink rotary, noisy and inefficient as it was. So the *Old Guard* had to finally succumb also to *the little bulbs that had nothing in 'em.*

This is what Dr. Lee DeForest, the man responsible for the development of the three element tube, had to say at this time (November, 1919):

"The average radio amateur knows enough of the extreme selectivity which the pure undamped wave makes possible, to realize that the problems of interference would largely vanish with the spark gap. Let the amateur urge upon his Congressman or Senator that if the government wishes to further legislate against radio interference, then legislate out of business the damped-wave transmitter."

1920

So it became necessary that the amateurs gradually develop the use of the vacuum tube for the various modes of CW transmission, modulating via key and voice, and for better receiving possibilities. With better sensitivity and selectivity built into receivers, our efforts were now directed toward solving the QSS *Bugaboo!* What is QSS? The Q code gives no definition. So — take a look into the May 1920 issue of *QST,* page 25. Well, since you do not have a copy, this "new" abbreviation was added to the list, adopted by ARRL to fill a need. What does it stand for?

QSS?—Do my signals fade?

QSS—Your signals fade.

Although rarely used, this abbreviation, even in these days, makes sense.

Amateur radio was not out of the woods regarding clear sailing without periodic attempts on the part of the government to curb their activities. The Poindexter Bill, originating as document #165 through a letter from the Secretary of the Navy, was in the hopper. It stood facing the amateurs later on as Poindexter Bill S-4038, and did not bode good news for the amateur. The time loomed on the radio horizon in 1920 to be thinking about international regulatory legislation to bring radio communication the world over under better control. A meeting of the International Communications Convention in Berne, Switzerland, was on the agenda. The radio amateurs had to have prominent representation. Intensive efforts were made to protect the rights and privileges belonging to the amateur. Charles H. Steward, member of the ARRL Board, was appointed legal counselor to speak for the amateur in these matters. In order to cement more firmly the ties that bind, amateurs decided that in numbers and in get-togethers there is strength, and much could be accomplished via this

Photo J. *"2PM" operating position located at 808 West End Avenue in New York City.*

route. The thinking centered on having regional conventions, typical gatherings to meet each other personally, to set out program meetings, and to air mutual problems.

One of the early conventions took place in Chicago, sponsored by the Central Division Managers of ARRL. Held September 2 to 4 at the Edgewater Beach Hotel, there were about four hundred in attendance. There had been similar conventions held in Boston and Philadelphia, but this one in Chicago was to be of wider scope in quantity and quality to bring home to all amateurs what we were up against. The report issued from headquarters: "The convention out-conventioned anything yet pulled off in amateur radio."

Not to be outdone, and to top off the year 1920, the Midwest ARRL Division decided that St. Louis would be the next place for a meeting. The time? December 28 to 30, under the sponsorship of the St. Louis Radio Club. Everybody of note in amateur radio circles showed up, from ARRL president Hiram P. Maxim, *QST* editor K. B. Warner, the Chicago gang, Paul Godley, M.B. West, R.H.G. Mathews, and of course, "The Old Man" himself, who gave a stirring account of the "joyous" and "glorious" three days.

To be continued.

HT Porta-Power Project

continued from page 15

1/4-inch and interior dimensions of 10-1/2 inches in length by 5 inches wide, which works well for this application. The box was bought at Staples, a retail chain office supply store. The only modification made to the box was cutting its wall height down so as to permit the cigarette lighter receptacle on the Power Station to be accessed. Someone with a table saw can easily do this. If you do not know of anyone who has a table saw, a cabinet shop or wood hobbyist in your local area should do it for a modest fee.

Getting it all together

Now comes the task of putting the whole package together. Place the Power Station toward the left side of the box. This allows the AC wall charger input jack to be easily accessed without rearranging the setup. In order to keep the Power Station from sliding around inside the box, position a piece of Styrofoam approximately 1/2 to 3/4 inches thick beside the Power Station. A piece about 3 x 5 inches will work to hold the Power Station in place by creating a stop that fills in the remaining space along the bottom of the box. This remaining space beside the Power Station can be used to store the HT battery, power cable, or other various accessories.

At this point, clip the HT somewhere along the front of the box. Locating it on the left side of the box permits clear

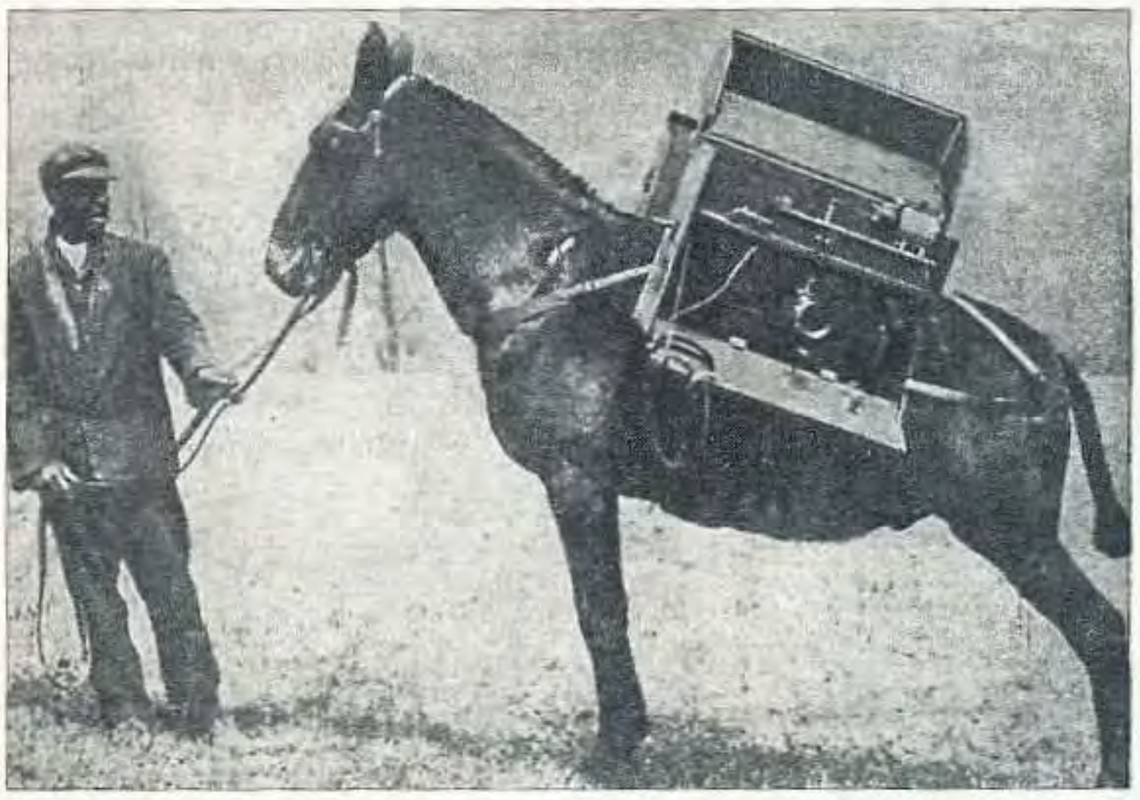

Photo K. *"Mule Mobile" was used by the Signal Corps during World*

Photo L. *An early QSL card, sent in 1917.*

access to the Power Station on-off switch and the 12 VDC output cigarette lighter receptacle. It also keeps the area of the battery voltmeter unobstructed. Run the HT's external power cord behind the HT and into the box. There should be enough space between the Power Station and the front wall of the box to put most of the cord. Then make connection to the 12 VDC output via the front panel cigarette lighter receptacle or the (+) and (-) terminals on the rear of the power unit. You could opt to use the 3, 6, or 9 VDC output jack if the desired operating voltage is to be less than 12 VDC.

Now the entire package must be bound together for easy transport. This is accomplished by using 1-inch-wide, 48-inches-long, non-stretch nylon belting material and plastic belt clips. The belt clips can be the type that do not require being sewn to the belting material. These items can be purchased at a fabric store such as Minnesota Fabrics. The belting is placed around the entire unit, going over the top of the Power Station handle, down the side, under the box, and up the other side. The fastening of the buckle clips can be located just off the right side of the power unit's handle. You may want to adjust the belt clips to whatever arrangement suits you. This method of holding the package all together works very well. The Power Station's handle actually is used as the handle for the whole package. The power unit has by far the majority of the weight, so it is best to employ its handle to do most of the work. The belting merely holds the box to the unit, which contributes a minimal amount of weight to the overall package.

If you use an external speaker microphone, it can be clipped to the front wall of the box or to an open spot on the belting material. For a finishing touch, consider adding self-adhesive rubber foot pads to the bottom corners of the box. They may be obtained at Radio Shack or a hobby store in your area.

The package makes a neat, highly portable, efficient, easy to configure, and long-lasting power source for extended operation. Also, it is very practical and inexpensive to put together!