VOLUME 1 NUMBER 9

PACIFIC RADIO NEWS

APRIL, 1920 FIFTEEN CENTS

IN THIS ISSUE:

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The Original Tubular Vacuum Amplifier

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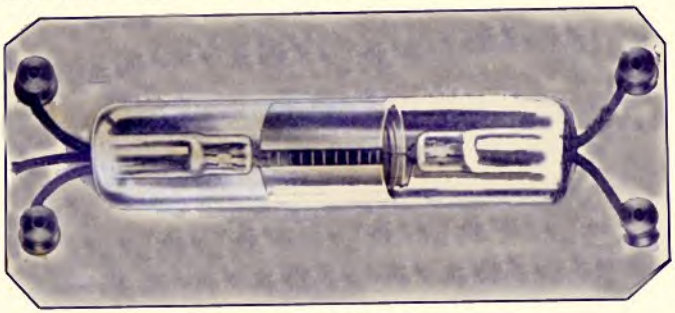

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Pacific Radio News

50 MAIN ST., SAN FRANCISCO

Volume I APRIL, 1920 No. 9

PAUL R. FENNER, Editor H. W. DICKOW, Advertising Manager

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Houston Amateur Communicates with Naval Seaplane NC-4

Following is the log of the NC-4 from 10:45 a. m. until the time of the landing, as sent to C. W. Vick, an amateur radio operator in Houston.

The three letter calls shown in the following messages the official calls assigned by the navy department; Vick, "5AC;" New Orleans naval station, "NAT;" N. C. 4, "NC4;" Port Arthur, "NJY."

No. 1—5AC to NC4, call and sign 5AC; No. 1—From NC4 to 5AC—Hear your signal qsa (radio abbreviation for loud), where are you located? Sign, NC4.

No. 2—From 5AC to NC4—Your signals are qsa here, too. This is amateur in Houston, Texas, and my station has been appointed by the local committee to get reports from you if it is possible. I will also be glad to take any message from you that you may have for Houston. What is your pisition now? Signed Vick 5AC.

No.2—From NC4 to Vick 5AC—Message received. NC4 left New Orleans at 10 a. m., passed over Cembalier bay at 11:15 a. m. and expect to arrive Galveston between 3 and 4 p. m. Will remember you if we have anything for your city. Signed NC4.

No. 3—From NC4 (Calls Vick, 5AC—Here is position report. NC4 over Caillon bay at 11:50 a. m.

No. 3—From Vick 5AC to NC4—Your position report received, and thanks. Signed Vick 5AC.

Seaplane Calls

No. 4—From New Orleans naval station (NAT) to NC4—Did you hear the seaplane AC5 calling you?

No. 4—From NC4 to New Orleans naval station—No, but I have been working 5AC, a Houston amateur. Probably you missed the call letters.

No. 5—From New Orleans naval station to NC4—Message received. I guess I had the call letters transposed. Signed NAT.

No. 6—From New Orleans naval station (NAT) to 5AC—Your signals loud here; is this amateur in Houston? Signed NAT.

No. 6—From Vick 5AC to New Orleans naval station (NAT)—Message very clearly received. You are correct; this is C. W. Vicks, call 5AC, of Houston, Texas. Have you anything for me? Signed Vick 5AC.

No. 7—From New Orleans naval station (NAT) to Vick 5AC—Message received. Thought at first you were airplane AC5. Your signals are very loud here. Have nothing for you now, but may see you later. Signed NAT.

No. 7—From Vick 5AC to NAT—Message received o.k.; will see you later.

Wants His Speed

No. 8—From Vick 5AC to NC4—What is your altitude, speed and at what time do you cross the Louisiana-Texas border? Signed Vick 5AC.

No.8—From NC4 to Vick 5AC—Message received; wait three minutes for answer. Signed NC4.

No. 8—From naval station, Port Arthur, Texas, to NC4—How far are you going to pass from Port Arthur? Signed NJY.

No.9—From NC4 to NJY—Message received. Commander says we will pass to south of Port Arthur about five miles. Signed NC4.

NC4 Reports

No. 9—From NC4 to Vick 5AC, NC4—NC4 eight miles south of marsh island at 12:20 p. m.; probably arrive Galveston shortly before 3 p. m. Signed NC4.

No. 10—From NC4 to Vick 5AC—Altitude now 2000 feet; speed 70 knots; one hundred twenty miles from Galveston 12.54 p. m. Signed Commander NC4.

Houston's Message

No. 10—From 5AC to NC4—Message received. Here is message from Houston, Texas: To Commander Read and crew of NC4, en route:

As a patriotic city, Houston took unbound pride in your achievement of making the first nonstop trans-Atlantic flight by air. This typically American triumph belongs to the whole country and is an affirmation of the policy of our people that aeronautical advancement must be carried by America to the highest point of development. To you pioneers of the aviation of tomorrow we extend Houston's greetings and assure you that the welcome awaiting you here is warm and sincere. Signed: A. E. Amerman, mayor of the city of Houston; C. Anderson Wright, president Aero Club of Texas, and D. S. Cage, president Houston Chamber of Commerce.

No. 11—From NC4 to Vick 5AC—Message received o.k. if initials of Care in signature are D. S. Signed NC4.

No. 11—From Vick 5AC to NC4—You are right. The initials are D.S. Cage. Signed Vick 5AC.

No 12—From NC4 to Vick 5AC—O.K.; message received o.k. Please don't repeat words, as your signals are fine. Signed NC4.

No. 12—From NC4 to Vick 5AC (2:25 p. m.)—NC4 passed Sabine Pass at 1:50 p. m. Commander Read says we will arrive Galveston 2:45 p.m. Signed NC4.

No. 13—From Vick 5AC to NC4—Position report received and thanks. Signed 5AC.

Message Sent Houston

No. 13—From NC4 to Vick 5AC, Houston—Here message to committee who sent us welcome. Hearty thanks and appreciation from all of us. Signed Read, NC4.

No. 14—From NC4 to Vick 5AC (2:32 p. m.)—Here's position report. We are nearing our goal. Only 20 miles east of Galveston now. Signed NC4.

No. 14—From Vick 5AC to NC4—Thanks. I would like that you call when you are making landing, will you? Signed Vick 5AC.

No. 15—From NC4 to Vick 5AC

(Continued on page 343)

The Growth of the Kilbourne & Clark Manufacturing Co.

By H. E. Jefferson

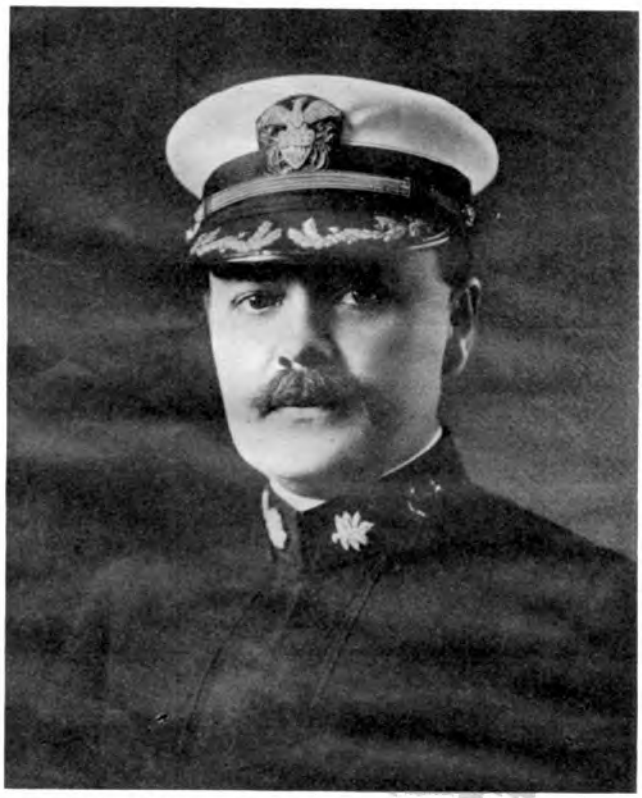
Assistant Chief Engineer, Kilbourne & Clark Manufacturing Co.

(Courtesy of Pacific Marine Review)

Commencing in 1907 with a small machine shop in the downtown section of Seattle, Washington, and manufacturing motor generators and rotary converters for the then existing United Wireless Company, the Kilbourne & Clark organization has progressed and expanded until it now occupies one of the largest and most modern factories on the Pacific Coast.

Since its early days, when located in the downtown section, the company has successively occupied three different factories, each larger and more modern than the previous one. Its present plant was especially designed, built and equipped to meet the requirements of the manufacture of radio apparatus, which forms the bulk of the output.

From the manufacture of motor generators and rotaries for wireless apparatus, the company was led to take up the manufacture of com-



Upper: Radio transmitters in assembly room at the Kilbourne & Clark plant.

Left: Commodore Frederick Grant Simpson, general manager of the Kilbourne & Clark Manufacturing Company.

plete radio equipment, and during the years 1912-1914, a considerable amount of radio development work was carried out, especially for the United States Navy Department. Largely as a result of this work and through the efforts of Mr. F. G. Simpson, general manager and chief engineer to the company, a successful type of commercial radio apparatus was developed, placed on the market and the first installation made early in 1914. Since then K&C radio apparatus has been steadily im-

proved and developed by a strong engineering organization until its construction is as rugged as, and comparable to that of, standard industrial equipment.

During the war the company was engaged in the manufacture of radio apparatus for the United States Navy Department on a 100 per cent basis, all facilities being turned over to assist in rapid production and the plant operating night and day. This strictly American industry, to which great impetus was given because its product was a war essential, found at the close of the war that a national and international demand had developed for its apparatus.

The head office is located at the new plant at Seattle, the officers of the company being: C. A. Kilbourne, president; F. G. Simpson, vice-president and general manager; R. O. Hall, second vice-president and assistant general manager. Mr. C. B. Cooper is superintendent of the Ship Owners' Radio Service, Inc., and is in charge of the New York office of the company. The San Francisco office is in charge of Mr. Ellery W. Stone. The new Seattle plant was completed and put into operation early in 1919 and is shown generally in the accompanying views.

The building is made up of four interconnected structures and is built of reinforced concrete with wooden floors laid on concrete slabs. The roof is of the saw-tooth type, affording the maximum possible daylight and ventilation; it is of mill construction, a part of the framework being supported by timber columns. The main shop building, an interior view of which is given, is 100' feet wide and 300 feet long and lies approximately north-south; three wings built at right angles to it extend easterly towards East Marginal Way, on which the plant fronts. The center wing constitutes the office building and is 60 feet by 60 feet; the north wing, 60 feet by 100 feet, is the stock and storage building, and the south wing, 60 feet by 100 feet, the engineering and laboratory building.

The Machine Shop

In the accompanying view it will be seen that the exterior of the plant is attractively laid out with lawn and shrubbery and presents a most pleasing addition to the industrial section of the city.

Power Supply and Shop Equipment

Power is supplied by the Puget Sound Traction Light & Power Co. from an outdoor sub-station consisting of two 100-KVA transformers

and located at the rear of the main shop building. Three-phase power is supplied to the shop at 220 volts; approximately fifty motors are installed to operate the shop equipment, a good number of the machines having individual drive. Some of the smaller machine equipment, such as lathes and drills, is operated in groups by motors hung from the ceiling. All automatic screw machines are located at an angle to the direction of the main shop, this enabling long bar stock to be handled without undue loss of space. A number of the heavier class of tools are driven by 10 and 15-horsepower individual motors.

A well-equipped tool-making department is maintained for the manufacture of jigs, punches and dies, precision tools and the numerous fixtures required for quantity production work. To facilitate rapid production, a systematic routing of work through the factory was planned and the whole organization and equipment were arranged with that system in view. Thorough inspection methods are applied at all stages of manufacture.

A finished part-stock room is maintained for the classification of all machined parts in order that work in the assembly department can be organized for rapid production. The accompanying view, showing a batch of radio apparatus under construction for the United States Navy Department, will give a fair idea of the lines along which the work of the assembly department is conducted.

All apparatus before being shipped is subjected to stringent mechanical and electrical tests in the commercial laboratory, a view of which accompanies this article. A well-equipped research laboratory is maintained where special tests are carried out and the latest developments of the radio art followed up.

The engineering organization is maintained not only to conduct research work and to produce new and improved designs, but to make inspections and tests during manufacture. The drafting department is equipped with an electrically-operated blue print and drying machine in order to facilitate the quick preparation of shop drawings.

SOME OPERATOR

The editor of the Twelfth Naval District Radio Bulletin tells the following in the Bulletin of February 6th:

"Several years ago when the ed was telegraphing at NPH, both the Western Union operators in the Vallejo office were quarantined with measles. The electrician in charge and myself were authorized to hold down the Vallejo office as best we could without interfering with our duties at the radio station until the Western Union Company could arrange to send reliefs. One night we had quite a bunch of night letters for San Francisco which we were saving for the overtime.

"About 9 p. m. (we had been getting O. T. since 8) we decided we had held them as long as we dared. The chief called and asked the San Francisco chief operator for a good man to take fifty.

"The good man came on and he was a good man. We started to move the bunch. The chief sent one and got his sine and then sailed through thirty average size NL's without a break. We wondered if he was still there, so I suggested that we send a few as rotten as we could, and they went so bad that I couldn't tell where he was. This went on for about ten, when we decided he was not there. The chief asked, "UTR?" and he got two dots in reply. He was so mad that he could not telegraph at all after that and I had to finish the job."

The Audion

By Dr. Lee DeForest

The first "commercial" audion, as it originally appeared in 1908, was no accident or sudden inspiration, for, failing to find in the incandescent gas mantel the genuine effect of response to electrical vibration which I had first searched for in 1900, I next explored the Bunsen burner flame, using two platinum electrodes held close together in the flame, with an outside circuit containing a battery and a telephone receiver. From that successful "flame detector" was evolved the evacuated vessel containing first two, then three electrodes, one at least of which was incandescent. Considering the actual genesis of the audion, it will be seen that it was never, strictly speaking, a rectifying device.

In surveying the wide field of electric communication today one cannot look back at the first grid-electrode of the audion without a sense of wonder at the enormous changes which it has wrought. It has made possible commercial trans-oceanic radio telegraphy. It has realized transcontinental telephony. It has made reception of wireless signals half way around the globe an every-day occurrence.

The uncanny accuracy of millions of shells from the allies' guns, the clocklike precision of advancing barrages would have been impossible save for the effectiveness of their trench and airplane radio service, in which the grid-audion was the essential heart. Today this little grid controls and modulates an ever-increasing kilowattage of radio telephone energy, which as early as 1915 conveyed the spoken voice from Arlington to Honolulu and more recently from New Brunswick to the transport George Washington in the harbor of Brest. It has already placed ten simultaneous telephone messages upon a single pair of wires.

A few ounces of grid wire makes possible the saving of hundreds of tons of copper in long-distance telephone conductors. It has given to the physicist a tool for the exploration of unprobed fields of research and to the electrical engineer a generator without moving parts of alternating currents of any desired frequency, from 1,000,000 to 10,000,000 periods per second—a machine absolutely constant and reliable in its silent work.

It was in the summer of 1912, when at work on the problem of audion amplifiers in cascade arrangements for telephone repeaters, that I first discovered that if the input or grid circuit was inductively coupled with the output, or plate inductance, the audion became a generator of continuous alternating currents, originally made evident by a shrill tone in the telephone receiver.

A few months after the audion was first used for the production of alternating currents of audible frequency, I first demonstrated the fact that weak high-frequency currents could equally well be generated, simply by substituting radio-frequency coils for the original iron-cored coils and small variable air condensers for the large telephone condensers of my original experiment of 1912.

The uniform generation of electrical oscillations in a circuit by means of an audion is one of the most striking and fascinating of its applications. There seems to be, in fact, no limit to the number of applications to which this three-electrode vacuum tube can be applied

as a tool in the hands of the experimental physicist.

Probably the most promising field of all is the arrangement of audions in cascade as amplifiers of pulsating currents of any form or frequency. It opens to the ear what the microscope has given to the eye—new regions of research in numerous and diversified fields, from physiology, for heart beats and breath sounds, to chemistry, where some even predict that we shall some day hear "the collision of individual atoms with one another."

By actual trial over cable circuits approximately 1000 miles in length, it has been found that as many as thirty of these audion amplifiers can be connected in tandem and produce excellent speech at the receiving end of the line. A well-known telephone engineer is authority for the statement that computation shows the attenuation of a cable circuit of this length to be so enormous that, if all the power received on the earth from the sun could be applied in the form of telephone waves to one end of the line without destruction of the apparatus, the energy received at the other end would be insufficient to produce audible speech without the use of amplifiers, whereas with thirty amplifiers used in tandem, the relatively minute energy of ordinary telephone speech currents at the transmitting end produced speech in the receiver at the opposite end which was both loud and clear, the amplification due to such a tandem arrangement of tubes being of the order of ten to the fiftieth power.

General (then captain) George O. Squier in 1910 carried out certain experiments which are destined to become classic as the new art of wired-wireless attains the important commercial proportions to which it is unquestionably destined. He, for the first time, used a constant reliable source of undampened electric currents of high frequency for the transmitter and an audion detector between each tuned receiving circuit and its telephone receiver. By this combination multiplex telephony became at once a realized fact.

But so long as a high-frequency alternator was required at each transmitter station the wired-wireless idea could not become commercialized. Its first cost, the size and weight of it with its motor, its delicacy of speed regulation, its limitation to relatively low frequencies all made this impossible. So again an important development was compelled to await the advent of the oscillating audion.

Supplied from a common filament-lighting battery, a common "B" battery or direct current generator, any desired number of tiny alternating-current generators (oscillating audions), each driving its own easily turned circuit, can now be assembled in a small central station. The grid of each oscillator is voice-controlled from its local telephone circuit and as many high-frequency "carrier" wave-trains superimposed upon a single trunk line pair as it may be feasible to use without interferences between the modulated frequencies of the several conversations.

Taken together, the improvements at both ends of the span, the use of undampened wave transmitters and the audion detector and amplifier have made possible the use of smaller antennae at transmitting stations, and have almost removed the necessity for any antenna at all at receiving stations. For example, under reasonable weather conditions it is quite easy to listen to the messages coming from stations on the other side of the Atlantic by using a receiving circuit of which the receptive element is a small coil of wire, three or four feet square. Thus, so far as receiving goes, it is possible to intercept virtually all the great stations

on one-half of the globe by means of apparatus contained wholly in one room or even in a cupboard.

"This does not mean that the use of antenna for reception is abolished; on the contrary, when these highly magnifying methods are put into operation with large antenna for the purpose of reception, the range over which signals can be received is extended very far beyond what it was in 1913, and, in consequence, it is possible, under reasonably good weather conditions, to receive at the Antipodes the signals from a modern high-power station. In accomplishing this the magnification in use amount to several hundred thousand-fold. All this is the work of a thing which looks like an ordinary electric-light bulb with a few extra pieces of metal in it—the three-electrode tube.

But more than this. Signaling by conduction currents of relatively low frequency will soon be practiced through the earth as well as water; and we will find the antennae of the future thrust upside down, deep into abandoned oil-well borings, and making contact with deep semi-conducting strata, at points separated by a few miles; the two inverted antenna of such a transmitter connected by an overhead power-transmission line containing the alternating current generator and signaling device, and to similar arrangement for receiving. Then our wireless messages will go through the earth's crust, or possibly by a more direct path, and not around the earth's surface, to be tangled up as at present with a bewildering snarl of static ravelings.

The future of radio signaling at sea lies with the telephone rather than the telegraph. The simplicity, the reliability with which the medium of an undampened wave carrier, ideally suited for the voice transmission, can now and will rapidly limit the crudities and laboriousness of the Morse code signaling between ships. Yet today scarcely the dawn of this new epoch has been seen. Vessel owners are today almost as skeptical regarding the practicability and utility of the radiophone as we pioneers found them toward the wireless telegraph sixteen years ago.

A HINT TO SHIP OPERATORS

It is of interest to ship operators to always endeavor to make as much use of radio in application to everyday ship problems as possible. One little idea is to get in touch with the captain or one of the mates and offer to provide accurate chronometer correction.

A clever and very accurate way of doing this is with a stop watch. All that is necessary is to start the watch going when the dash of the time signal is made and turn it over to the officer who is in charge of the chronometer. He stops the watch on the even minute as shown by the chronometer and then easily obtains his error.

AIRPLANE RADIO COMPASS TESTS PECULIAR

The Bureau of Steam Engineering has recently ordered shipped to the Naval Air Station, Pensacola, Florida, a complete radio compass coil system for temporary installation for the purpose of determining the direction of aircraft during flight and will be the means of training pilots in radio compass work.

Recent experiments, conducted along this line up to distances of ten miles have revealed a peculiar phenomena in that the observed direction was from four to ten degrees astern of the plane in flight.—Twelfth Naval District Radio Bulletin.

REVIEW OF "ELEMENTS OF RADIOTELEGRAPHY"

It is indeed appropriate and with pleasure that we review the book, "Elements of Radiotelegraphy," by Ellery W. Stone, a Pacific Coast author. This book is one of the most concise and simply written ones on the subject. One need not have more than a common school education to study this book profitably and actually learn the elements of radiotelegraphy.

Those things which amateurs in the radio field are so anxious to know about, such as electro-magnetic induction, alternating current, damping and resonance, logarithmic decrement, wave length, frequency, and vacuum tubes, are clearly described and explained. While the book is written with the physical aspect of radio principles in mind, a certain amount of readily understandable mathematics is brought in where necessary.

The publishers are D. Van Nostrand Company, 25 Park Place, New York. It is for sale at Leo J. Meyberg Company, San Francisco, and other important radio stores.

THE RADIO EXCHANGE

The Radio Exchange of Oakland, Cal., located at station 6 BG, is something new in radio shops. Apparatus is sent there to be resold on a commission basis. A large stock of second hand vacuum tubes, loose couplers, tuners, transmitting transformers, antenna wire, oscillation transformers, rotary gaps, phones and miscellaneous parts is always to be had. Besides second hand apparatus The Radio Exchange carries Halcun, Parkin, Murdock and Kennedy radio apparatus. Amateurs who wish their outgrown apparatus sold can send it to the Radio Exchange and have it sold for them.

SIXTH DISTRICT SPECIAL STATIONS

6XE—National Radio Co., 313 Lighthouse Ave., Monterey, Cal.

6XG—National Radio Co., Fairmont Hotel, San Francisco, Cal.

6XJ—O. B. Moorhead, 250 West Clay St., San Francisco, Cal.

6XK—National Radio Co., 848 Clayton St., San Francisco, Cal.

6XO—National Radio Co., 156 Second St., San Francisco, Cal.

6XP—Moorhead Laboratories, 638 Mission St., San Francisco, Cal.

6XQ—Southern California Edison Co., Edison Bldg., Los Angeles, Cal.

6XR—San Joaquin Light & Power Corp., Auberry, Cal.

6XV—Federal Telegraph Co., Palo Alto, Cal.

6XX—St. Mary's College, Oakland, Cal.

6XY—National Radio Co., Los Altos, Cal.

6ZA—I. J. Karr, 243 E. Seventh South St., Salt Lake City, Utah.

6ZC—Dr. J. B. Ellis, Cohise, Ariz.

6ZE—D. B. McGown, 1247 Forty-seventh Ave., San Francisco, Cal.

CALL LIST ERRATA

(March Issue)

The address of 6EM should read: L. T. Dehmlow, 426 First Ave., National City, Cal.

A Litzendraht Receiving Antenna

By E. T. Jones, A. M. I. R. E.

It has always been pointed out that litzendraht should be used to secure high efficiency in our receiving transformers and tuning devices, but that all important factor, the receiving antenna, has been left as satisfactory with only the use of a few single conductors. If we are to secure the maximum efficiency of receiving signals we should start in with the antenna as the first place where conservation of energy is necessary.

Not only has a litzendraht antenna many advantages over the ordinary solid wire or stranded wire antenna in connection with increased efficiency but it also has mechanical advantages. The litzendraht antenna can be strung between masts about one hundred feet apart and can be kept taut without much pull on either mast. Besides being very light it makes a neat appearance because the wires stay nice and taut.

By the use of a lizendraht antenna it is possible to use a much lower one on account of the increased strength of receiving signals. For example, on a litzendraht antenna 125 feet long, twenty feet high at one end and four feet high at the other, signals were received from stations one thousand miles distant using only a silicon detector, loose coupler, and Brandes phones. The litzendraht antenna wire in this case was of seven strands of No. 28 D. C. C. magnet wire.

Comparisons were made by erecting one antenna of phosphor bronze wire and the other of five strands of No. 24 S. C. C. magnet wire. Each antenna consisted of two conductors of the kind mentioned. The strength of the signals received on the litzendraht antenna were more than 15 per cent stronger. If the antenna had been larger the percentage of increased efficiency would have been greater.

By using a greater number of strands, say 10 or 12, still better results can be expected. The explanation for these better results is that in litzendraht each wire is perfectly insulated from the other and the surface presented to the flow of the high frequency current is much greater than in plain stranded wire Plain stranded wire is not nearly as efficient because parts of each strand come in contact with one another and do not act as "surface" or "skin" conductor.

In construction of the litzendraht antenna each end of each conductor should be soldered together, that is, the end of each strand of magnet wire must be scraped and all the wires connected together and soldered. Where the lead in is brought into connection with the instruments each strand of the magnet wire should be scraped and separately connected or soldered to the instrument.

In building a litzendraht antenna it is well to remember that efficiency will be lost to a great extent if any portion of the circuit from ground to end of antenna has a high resistance, thus, it is well to use litzendraht throughout in the construction of apparatus and leads.

Radio Clubs

SACRAMENTO RADIO CLUB

The Sacramento Radio Club of Sacramento, California, announces that meetings are held every other Thursday night. As soon as the new radio installation is completed, meetings will be held weekly. Mr. W. R. Coover is president of the organization. Mr. F. A. Harkness is secretary and Mr. H. E. Stevens is treasurer. Meetings are held at 2714 Que street.

SAN FRANCISCO RADIO CLUB

Twelve new members were admitted to the San Francisco Radio Club, Inc., during the month of February. With the admission to the club of these new members, the membership campaign is brought to a close. The initiation fee is again $2.50. As the present membership is limited to one hundred, it is requested that all prospective members file their applications for membership at an early date. The club rooms at 355 Presidio avenue have recently been furnished with modern conveniences for the members.

A buzzer practice class will be inaugurated during the early part of the month. Instruction on modern radio apparatus will also begin. Members will be prepared to pass the commercial examination.

At the last open house meeting an interesting address was delivered by Mr. A. E. Bessey of Sunnyvale, California. Mr. Bessey strongly denounced the "hogs of the air" and asked the radio amateurs to refrain from interfering with long-distance work after ten o'clock p. m. His address was received with the most hearty applause of a gathering of radio men that has exceeded any previous attendance of the local radio club.

POLYTECHNIC RADIO CLUB

The Polytechnic Radio Club of San Francisco held an "open night" on Saturday evening, March 6th, at their club room at Polytechnic High School. The large attendance that gathered were very much interested in the wonderful phenomena produced by a Tesla coil as demonstrated by the president, Mr. Tinsley. The Tesla coil was built at the school along with other apparatus that was on exhibition, including audion panels, a wireless telephone, short-wave sets, etc.

The code practice set afforded those who desired it practice in sending and receiving. A two-step amplifier was used for the reception of long waves, while a single tube was employed for amateur wave-lengths. Excellent results were obtained on both sets.

Some of the late models of apparatus were demonstrated on open house night. The Tresco tuner was demonstrated. Mr. J. Pendergast has entered his name as a contestant to the "Pacific Radio News" subscription contest and secured ten subscriptions from club members in one night. He says he is going to win the tuner or die in the attempt.

SPECIAL OFFER TO RADIO CLUBS

Get in touch with our business manager at once regarding a special offer he is making to radio clubs. Write today for information. Pacific Radio Publishing Co., 50 Main St., San Francisco, California.

What you don't see in this issue of Pacific Radio News you will see in future issues. Why not subscribe?

Signal Corps to Co-operate with Foresters

By William Leonberger, M. S. E.,
Signal Corps, U. S. Army

During the past years there has been such enormous loss of timber throughout the Pacific Northwest from forest fires that the situation has become very alarming to the forestry service. Warnings of all descriptions have been posted to prevent careless campers' fires, started mostly by the many tourists traveling through the timber lands. Severe penalties imposed on many offenders time and time again have not secured the desired effect. Every precaution has been taken to check the ravage of forest fires throughout our best forests, but still the loss has amounted to millions of feet of timber every year.

Many of the fires which caused large losses could have been averted if the forestry service had had a few minutes' notice after the fire had begun. But how was this to be done, and who would there have been in the vicinity of the fire to have reported it? These are the questions that have perplexed the forestry service until recently.

A product of the world war has again come forward to be put to use in solving the timber-saving problem. Reference is made to the radio communications used in the war between ground and aeroplane to signal enemy movements and positions and firing data for our artillery. Now, instead of the "eyes of the air" watching the movements of the enemy and the radio operators copying war data, the aero squadrons, in conjunction with the Signal Corps and forest service, will form their own little combat plans to fight the forest-fire menace this coming summer.

During the war the Signal Corps brought forth great improvements in radio instruments whereby the necessary information could be transmitted from aeroplanes to ground stations. Speed and accuracy was required; the instruments had to be compact; the signals had to be stronger so as to hear through artillery, and the apparatus in general had to be more rugged. These improvements were made and now the Signal Corps has been called upon to furnish equipment for the installation of forty radio stations and necessary personnel for the forestry service in the Pacific Slope forests. The stations will work in conjunction with the aero service, squadrons of which will patrol the states of California, Washington, Oregon, Idaho, Nevada and Wyoming. All the stations and the entire plan will be completed by the first day of June, 1920.

Everyone will then be on the alert for the information that will be flashed to these various stations from the aeroplanes which will send fire-fighters on their way to extinguish the discovered blaze. In many cases, it is estimated, fire fighters will have reached the vicinity of the fire so quickly that the guilty camper can be taken into custody and be apprehended.

RADIO MANUFACTURER WORKING TO CAPACITY

One of our local manufacturers, the Colin B. Kennedy Company, has more orders for his Type L W R 20 long-wave regenerative receivers than he can fill at once. The Kennedy apparatus is, beyond a doubt, the most perfect in finish and workmanship of any made in the United States, and, according to the success of the company, the merit of the product has been proved.

Something might be told here of the performance of one of the LWR 20 receivers. Here in San Francisco, using a 165-foot two-wire antenna, one bulb and no amplifier, the German station at Nauen, signing POZ, is easily heard. The North Head 600-meter 500-cycle navy station can be heard at any time of the day. Tests such as these are conditions of sale.

It is noticeable that the Kennedy Company stocks raw materials which are extremely hard to get elsewhere. For instance, ruby mica and copper foil are almost impossible to procure. Kennedy has this in stock, however.

A very fine catalogue is in the process of making. If was slightly delayed on account of the adding of several lines of apparatus to the printed matter. It will soon be off the press.

TRESCO TUNER PROVES ITS MERIT

That the Tresco tuners prove to be all that is claimed for them is the enthusiastic verdict of several prominent San Francisco amateurs.

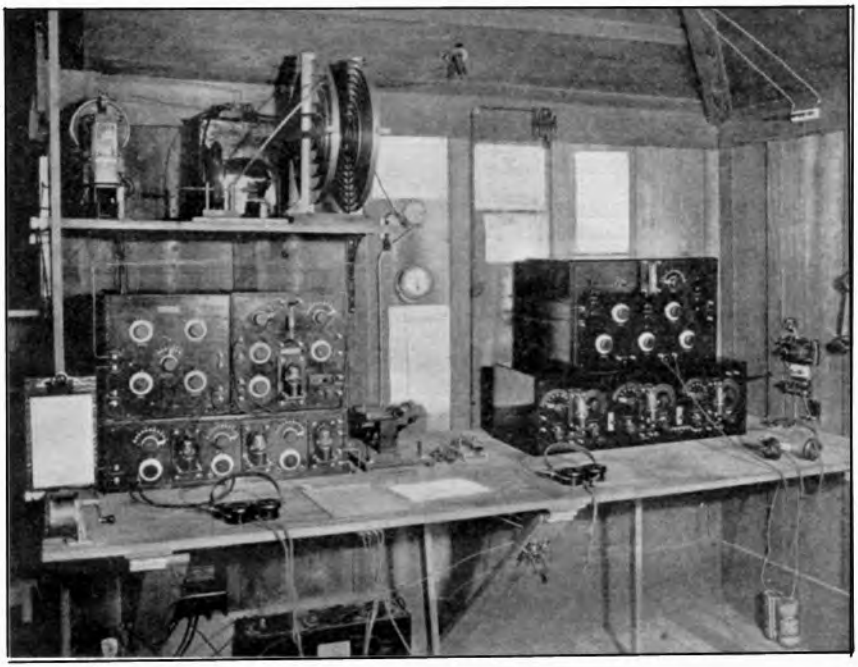
The secret of the good results obtained with these tuners lies in the winding. The conductor is wound on the involute curve principle and really equals, if not surpasses, the results of the honeycomb wound coils. Capacity effects are not apparent and signals come in very clear and sharp with these tuners.

The Tresco people make three distinct types of the couplers—one a tuner for 3500 meter to 20,000 meter wavelengths; another with a tickler coil for receiving 200 meter waves, and the third for 3000 meter waves.

REMARKABLE LAG AT TRANS-ATLANTIC CONTROL STATION, WASHINGTON, D. C.

Talk about lag on control wires, listen to this one about the control wire to Sayville. While sending to POZ one day, Dave thought it funny he did not hear any sigs. Now, all hands here know that the lag on the Sayville remote control is SOME lag. After dispensing the dots and dashes for about an hour, he decided to go and tie on the feed bag. On returning he started in fiddling with the old JAY TUBE, thinking perhaps she was on the blink. During the operation he put on the receivers and heard something going out that sounded familiar. After listening a few minutes he discovered that it was the messages he had sent before going to lunch. Whether they had stopped on the way to have a little friendly chat before going on over to POZ, or whether they struck a kink in the wire, Dave has not decided. — Twelfth Naval District Radio Bulletin.

One of the Pacific Coast's Best



Amateur Station of A. E. Bessey

Above is shown a half-tone of the amateur station of Mr. A. E. Bessey of Sunnyvale, California. The receiving set is composed of a Colin B. Kennedy Company short-wave regenerative and Colin B. Kennedy long-wave receiver. The detector and four-step amplifier was also made by the Kennedy Company to order. The three-step amplifier under the long-wave tuner to the right was made by Mr. Bessey's son Ernest.

The transmitting set is seen at the upper left of the picture. It consists of a 1 K.W. Thordarson transformer, Thordarson condenser, rotary spark gap and pancake type oscillation transformer.

Stations with which actual communication has been carried on are 6BQ, 6EA, 6GQ, 7ZB, 7CC, 7DK and 7YS. Stations located in the bay city region and as far south as San Diego have been heard. Among other stations heard are 6ZA, 5AR, 5ZA and 9ZN. 7YS can be heard at Mr. Bessey's station twenty or thirty feet from the phones.

The antenna is ninety feet high, running practically straight from the mast down to the set.

On the long wave receiver all the east coast stations are heard and also POZ, MUU, EAA, Honolulu, Cavite, Vladivostok and others too numerous to mention.

Mr. Bessey says, "I expect to put in a wireless phone in the near future and after that is in will feel that my station will be almost complete. On the air I find there are new boys coming in all the time, and it looks as though the air would be busy in the future."

Sixth District Amateur Stations

6KJ	Meyer, G. H.	184 S. El Molino Ave.	Pasadena, Cal.
6KK	Hutchinson, R.	246 N. Orange St.	Glendale, Cal.
6KL	Bates, Wm., Jr.	450 Alcatraz Ave.	Oakland, Cal.
6KM	Adams, K. A.	2060 E. Main St.	Stockton, Cal.
6KN	Rose, M. F.	1314 40th Ave.	Oakland, Cal.
6KO	Moxley, S. P.	1050 E. 47th St.	Los Angeles, Cal.
6KP	Garretson, O. S.	2817 La Salle St.	Los Angeles, Cal.
6KQ	Truitt, L. S.	317 W. Doran St.	Glendale, Cal.
6KR	Warner, S. W.	3020 Telegraph Ave.	Oakland, Cal.
6KS	White, H. E.	990 E. Mountain St.	Pasadena, Cal.
6KT	Swift, E. M.	220 Franklin St.	Napa, Cal.
6KU	Brown, C. C.	Volta Power House	Mantou, Shasta Co., Cal.
6KV	Evans, Wm.	1416 5th St.	Long Beach, Cal.
6KW	Nourse, Randle	863 S. 10th St.	San Jose, Cal.
6KX	Stammers, Dorn	2119 Whitson St.	Selma, Cal.
6KY	Harris, J. B.	651 S. 12th St.	San Jose, Cal.
6KZ	Nielssen, S. F.	2258 E. 19th St.	Oakland, Cal.
6LA	Britton, W. J.	2115 Myrtle St.	Oakland, Cal.
6LB	Thorne, P.	537 Hobart St.	Oakland, Cal.
6LC	Bartholomew, L. A.		Los Angeles, Cal.
6LD	Lachler, L. J.		Pomona, Cal.
6LE	Wilson, Chas.	3040 Benvenue Ave.	Berkeley, Cal.
6LF	Harris, J. B.	651 S. 12th St.	San Jose, Cal.
6LG	Cartwright, H.	P. O. Box 515	San Gabriel, Cal.
6LH	Perkins, G. B.	161 Oak Knoll Ave.	Pasadena, Cal.
6LI	Bullen, E. L.	430 National Ave.	National City, Cal.
6LJ	Gleason, E.	800 South 8th St.	San Jose, Cal.
6LK	Everitt, F.	1028 Formosa Ave.	Hollywood, Cal.
6LL	Spagnuolo, Manuel	721 Kirkham St.	Oakland, Cal.
6LM	Corpe G. S.	348 W. Center St.	Covina, Cal.
6LV	Brockaway, D. C.	4402 Sunset Blvd.	Los Angeles, Cal.
6LW	Sunseri, N.	1260 E. Colorado St.	Los Angeles, Cal.
6LX	Lindsay, R.	331 Salem St.	Los Angeles, Cal.
6LY	Stith, R. B.	7278 Hollywood Blvd.	Los Angeles, Cal.
6LZ	Barnes, L. C.	1316 Walnut St.	Glendale, Cal.
6MA	Y. M. C. A.	715 S. Hope St.	Los Angeles, Cal.
6MB	Heppenstall, W.	2047 W. 29th St.	Los Angeles, Cal.
6MC	McGown, D. B.		San Jose, Cal.
6MD	Cassar, R. J.	1606 N. Alexandria St.	Los Angeles, Cal.
6ME	Dalbin, B.	1030 Arapahoe St.	Los Angeles, Cal.
6MF	Schaffner, L. L.	1320 Illinois St.	Los Angeles, Cal.
6MG	Forman, I. L.	427 S. Alvarado St.	Los Angeles, Cal.
6MH	Smith, H. J.	3415 Glenn Abyn Drive	Los Angeles, Cal.
6MI	Munson, W. A.	1323 Portola Av.	Los Angeles, Cal.
6MJ.	Bell, A. C.	1152 S. Berendo St.	Los Angeles, Cal.
6MK	Sill, Jos.		Sierra Madre Villa, Cal.
6ML	Gubin, L. J.	845 Crenshaw Blvd.	Los Angeles, Cal.
6MM	Lincoln High School		Los Angeles, Cal.
6MN	Teschan, C. V.	3602 Glassell Av.	Los Angeles, Cal.
6MO	Warrington, P. E.	4810 Gramercy Av.	Los Angeles, Cal.
6MP	Fitzpatrick, G. H.	3690 3d St.	San Diego, Cal.
6MQ	Chaffee, H. S.	1111 Los Robles Av.	Pasadena, Cal.
6MR	Schmidt, Wm.	51st and Vermont Sts.	Los Angeles, Cal.
6MS	Sant, Robt.	746 Maine St.	Long Beach, Cal.
6MT	Hoyn, Harry	6122 DeLongpre St.	Los Angeles, Cal.
6MU	Roberts, H. W.	5327 Monte Vista St.	Los Angeles, Cal.
6MV	Thompson, A. K.	1025 W. Florence St.	Los Angeles, Cal.
6MW	McKee, J. L.	123 N. Alta St.	Los Angeles, Cal.
6MX	Frietas, E. A.	554 W. 45th St.	Los Angeles, Cal.
6MY	Soaring, Harold	300 N. Alta St.	Los, Angeles, Cal.
6MZ	Gray, J. F.		Del Mar, Cal.
6NA	Nielsen, A. S.	849 Athens St.	Oakland, Cal.

Inside Facts on NPG, the Yerba Buena Navy Station

How often have you wondered how many waves of NGP (Yerba Buena, San Francisco, Cal.) controlled? There is certainly a lot of complexity and general "mixup" to the system if you aren't familiar with it.

The station as at present organized is composed of the following transmitters:

One 30 KW Federal Arc at Mare Island Navy Yard.

One 50 KW Federal Arc at South San Francisco.

One 15 KW Federal Arc at San Francisco "Beach" station.

One 5 KW Marconi 500 cycle quenched set at Hillcrest.

One 5 KW Telefunken 500 cycle set at Mare Island.

One 1 KW short range spark set at Yerba Buena Island.

One Navy Standard Short Range Telephone set at Yerba Buena Island.

All of the above transmitting sets are controlled from the radio station NPG which is situated on the topmost point of Yerbe Buena (Goat) Island in San Francisco Bay. The Mare Island Arc is used for Navy business exclusively, and operates usually on a wave of 4800 meters. The South San Francisco Arc, which is the old Federal "South City" arc (KSS) is used for Transpacific business on the Honolulu circuit, and is usually operated on 6100 meters. The "Beach" Arc, ex-Federal KFS, is used for working with arc equipped ships, and is usually adjusted to radiate on 3100 meters. Old Hillcrest (KPH), now is also controlled from Yerba Buena, and is used for transmitting on a wave length on 600 meters, and handles the commercial ship to shore business on 600 meters. The Mare Island spark is used for official Navy business and usually works on 2400 meters.

Time signals are sent on the Mare Island arc on 4800 meters, and on the Mare Island spark on 2400 meters; after the time signals are sent a QST is sent by the Mare Island spark on 2400, 952 and 600 meters, giving the weather forecast for the next day. The time signals are sent direct from the Naval Observatory at Mare Island, there being a loop to the Observatory on the Yerba Buena-Mare Island control circuits, which is cut in at 11:55 a. m. and 9.55 p. m. respectively, the "time" being sent direct by a special set of contacts fitted to the pendulum of the standard clock at the Observatory, which closes the line circuit in the well known manner, causing the time signals to be sent out by the transmitting equipment. It may be of interest to know that the exact "time" is to be taken at the beginning of the long dash which denotes that the final time period has been sent, i. e., at the beginning of the long dash which indicates "noon" or "ten" o'clock p. m.

The receiving equipments at Yerba Buena are in all cases the regular Navy Standard sets. For short wave work (600 meters) the SE 1220 receiver is used; for long wave work the SE 899 receiver is used; two step audion amplifiers are installed in the receiving booths, and any reasonable loudness of signals may be obtained. Each receiver is connected to a separate antenna, which is suspended from the main mast on the top of the hill to the various other masts on the Island.

The short range, low power 1 KW 250 cycle set is used for short range inter-fleet communication, only, and the receiving and transmitting sets are both located on the top of the Island. The telephone equipment

(Continued on page 343)

Seventh District Amateur Stations

7CM	Volger, John C.	122 Belmont N.	Seattle, Wash.
7CN	Harris, Wayne W.	543 N. Broadway	Marshfield, Ore.
7CO	Fitzpatrick, G. W.	3252 Ferdinand St.	Seattle, Wash.
7CP	Woolf, Irving	1905 Washington St.	Seattle, Wash.
7CQ	Stone, Robt. G.	P. O. Box 616	Boise, Idaho
7CR	Galyean, Ralph T.	460 Miller Ave.	Portland, Ore.
7CS	de Neuf, Emil	4411 Juneau St.	Seattle, Wash.
7CT	Gagnon, Henry S.	409 San Rafael St.	Portland, Ore.
7CU	Mumford, H. S.	518 Beach	Vancouver, Wash.
7CV	Carlquist, C. M.	1061 Concord St.	Portland, Ore.
7CW	DeGuire, Olfan		Silverton, Ore.
7CX.	Peek, Lloyd M.	4916 Wallingford Ave.	Seattle, Wash.
7CY	Crawford, Ben	323 South J St.	Tacoma, Wash.
7CZ	Fraer, C. E.	88 Park Ave.	Marshfield, Ore.
7DA	Criteser, G. B.	967 Vernon Ave.	Portland, Ore.
7DB	Manning, Franklin.	917 S. Sheridan Ave.	Tacoma, Wash.
7DC	Carlson, Lawrence		Billings, Mont.
7DD	Crager, F. H. Jr.		Helena, Mont.
7DE	Quigley, L. A.	838 Tibbets St.	Portland, Ore.
7DF	Bolstad, Archie L.	1832 4th Ave. W.	Seattle, Wash.
7DG	Hempel, C. B.	1105 E. 23rd St. N.	Portland, Ore.
7DH	Van Slyke, L. G.		Hyattville, Wyo.
7DI	Quarles, R. M.	Warm Springs Ave.	Boise, Idaho
7DJ	Stanley, L. L.	320 State St.	Helena, Mont.
7DK	Austin, Chas. L.	651 E. Salmon St.	Portland, Ore.
7DL	Moore, Clark	438 8th St.	Raymond, Wash.
7DM	Gibbs, F. F.	512 East 4th St.	Hood River, Ore.
7DN	Smith, Roy	443 7th St.	Raymond, Wash.
7DO	Miklave, Rudolph		Black Diamond, Wash.
7DP	Cameron, Geo. W.	500 12th St.	Portland, Ore.
7DQ	Gidley, Donald	771 4th St.	Marshfield, Ore.
7DR	Baker, Howard E.	153 Harrison St.	Seattle, Wash.
7DS	Leidigh, W. A. Jr.	555 44th St.	Portland, Ore.
7DT	Mortell, R. P. E.	102 West Mercer St.	Seattle, Wash.
7DU	Ludgate, W. G. Jr.	977 Multnomah St.	Portland, Ore.
7DV	Pinkham, H. N.	617 28th Ave. N.	Seattle, Wash.
7DW	Aldrich, K. B.	1012 S. 12th St.	Tacoma, Wash.
7DX	Upthegrove, J. G.	344 East 41st N.	Portland, Ore.
7DY	Middleton, J. E.	145 N. Normal St.	Burley, Idaho
7DZ	McCracken, H. C.	460 E. 13th St. N.	Portland, Ore.
7EA	Clodfelter, N. A.	1221 Madison St.	Portland, Ore.
7EB	Simpson, W. D.	1543 Court St.	Salem, Ore.
7EC	Simington, R. M.	1247 Tillamook St.	Portland, Ore.
7ED	Russ, W. V.	831 Michigan St.	Portland, Ore.
7EE	Marshall, R. E.	1135½ Albina Ave.	Portland, Ore.
7EF	Bogue, E. B.		Du Pont, Wash.
7EG	Stewart, G. R.	W. 8th St.	Ellensburg, Wash.
7EH	Cardinal, L. W.		Du Pont, Wash.
7EI	Fisher, A. L. Jr.	2443 N. Yakima Av.	Tacoma, Wash.
7EJ	Gurley, W. E.	2332 Monroe St.	Corvallis, Ore.
7EK	Lunan, Leslie	806 S. M St.	Tacoma, Wash.
7EL	Folsom, G. H.	7427 Olympic Court	Seattle, Wash.
7EM	Stone, E. M.	4215 Aurora Av.	Seattle, Wash.
7EN	Altick, Bernard	1715 Ravenna Blvd.	Seattle, Wash.
7EO	Louis, H. T.		Dayton, Ore.
7EP	Driffield, F. C.		Unga, Alaska.
7EQ	Ramsey, J. S.	215 E. 9th St.	Ellensburg, Wash.
7ER	Emigh, Chas. M.	1010 N. 11th St.	Tacoma, Wash.
7ES	Fries, Arthur J.	623 Boylston Av. N.	Seattle, Wash.
7ET	Robinson, I. N.	211 Joliet St.	Helena, Mont.
7EU	Maguranich, Jos.	2123 3rd Av., W.	Seattle, Wash.
7EV	Obrien, L. F.	902 S. G St.	Tacoma, Wash.
7EW	Palmer, W. S.	6308 S. Yakima Av.	Tacoma, Wash.

PACIFIC RADIO NEWS

SUBSCRIPTION CONTEST

ENDS MAY 1, 1920.

NOW IS THE TIME TO ENTER AND WIN

50 cents worth of Radio Apparatus for each Subscription you secure

YOU CAN'T LOSE

Just think of it; you get 50 cents worth of radio apparatus for every single subscription sent in. Isn't that "easy money" for you? A fifty cent coupon will be issued to every contestant for each subscription. These coupons will be redeemed by the following firms at their face value:

Leo J. Meyberg Co., 428 Market St., San Francisco, Cal.
C. Brandes, Inc., 32 Union Square, New York City.
Colin B. Kennedy Co., 140 Second St., San Francisco, Cal.
Remler Radio Mfg. Co., San Francisco, Cal.
Tresco, Davenport, Iowa.
Oard Radio Laboratories, Stockton, Cal.
Audiotron Sales Co., Lick Building, San Francisco, Cal.
Halcun Radio Co., San Francisco, Cal.
Radio Apparatus Service, Washington, D. C.
Parkin Mfg. Co., San Rafael, Cal.
Western Radio Laboratories, 156 Second St., San Francisco, Cal.
Toledo Radio Specialties Co., P. O. Box 343 Central Sta., Toledo, O.
Radio Equipment Company, 1525 N. Fawn St., Philadelphia, Pa
Shotton Radio Mfg. Co., Scranton, Pa.
A. H. Grebe & Co., 10 Van Wyck Ave., Richmond Hill, N. Y.
Modern Radio Equipment Co., Elizabeth, N. J.
Wireless Specialty Apparatus Co., Boston, Mass.
The Acme Apparatus Co. 27 Windsor St., Cambridge, Mass.
The Western Radio Electric Co., 512 E. Ninth St., Los Angeles, Cal.
Teco Radio Co., Boston, Mass.

Your coupons may be used singly or in combination with others or cash. For instance if you wish to have a tuner selling for $15.00, just send in thirty fifty cent coupons, or, for example, twenty coupons and five dollars. In other words, use the coupons just like money.

DON'T FORGET THAT

PACIFIC RADIO NEWS is a comparatively new magazine and there are thousands of radio men everywhere who will subscribe if YOU will take their subscriptions.

YOU CAN GET

Fifty-cents worth of Radio Apparatus

for each year's subscription you send in to Pacific Radio News. Fill in the blank below and learn how you may secure the best radio apparatus free.

The following contestants have entered so far:

Gilbert Earle, Berkeley, Cal.
Asa S. Keller, Monroe, Wash.
Martin L. Jones, New Orleans, La.
J. V. Husen, San Francisco, Cal.
Oliver Wright, Pasadena, Cal.
C. F. Filstead, Los Angeles, Cal.
Carl E. Roth, Napa, Cal.
Herbert Vincent, Fresno, Cal.
E. W. Leeper, Long Beach, Cal.
Laurence Hall, San Francisco.
Earl H. Andreen, Superior, Wis.
H. Huston, San Fernando, Cal.
James Walker, San Dimas, Cal.
Omar J. Humphrey, Jr., Seattle.
J. Prendergast, San Francisco
T. K. Teeter, San Francisco, Cal.
N. G. Hueter, San Francisco, Cal.
E. L. Chaix, San Francisco, Cal.
Albert O'Neil, St. Paul, Minn.
P. Byrne, San Francisco, Cal.
Irving Baum, San Francisco, Cal.
Kenneth Hupp, Berkeley, Cal.
Clarence Harris, San Francisco.

So far the race is so close that no predictions can be made as to who is ahead. Next issue watch for the number of subscriptions sent in by each contestant.

You have till midnight of May 1, 1920, to get Subscriptions in the Mail to receive credit.

SIGN THE BLANK BELOW AND SEND IT IN

ENTRY BLANK

PACIFIC RADIO NEWS,
50 Main St.
San Francisco, Cal.

I hereby enter my name as contestant for the Pacific Radio News subscription contest starting February 1st, 1920, and ending May 1st, 1920.

Name.....

Address .....

City and State.....

(Continued from page 339)

was installed primarily for communication with the Fleet, and consists of the Standard Navy Type Western Electric Telephone, with a special repeating coil in the circuit, by which this telephone may be plugged right in to the land telephone line from San Francisco, and direct radio conversation had with ships lying in the harbor; a separate antenna several hundred feet away is used for receiving on this "telephone line" so that two way conversation may be used.

Regular schedules are maintained at this station with Honolulu (NPM), on the South San Francisco Arc, and with all the other ship and shore stations simultaneously by using the various different transmitters and control circuits. It is possible, for example, for the 600 meter spark operator to be working with a merchant ship, say 1000 miles away, while the 2400 meter spark operator is handling business to Eureka, or for the 4800 meter arc station to be sending to San Diego, while the 3100 meter man is sending to a commercial arc equipped ship off of the Oregon Coast. A practically unlimited variation of working conditions can thus be seen to be available and still they are all found to be functioning without interference or without other serious difficulty between the various operators or circuits.

(Continued from page 324)

(2.35 p. m.)—Message received. Yes. Wait about seven minutes. Signed NC4.

Report Landing

No. 15—From Vick 5AC to NC4—Received your o.k.; am waiting for your call now. Signed Vick 5AC.

No. 16—From NC4 to Vick 5AC (2:37 p. m.)—Good evening. Now ready to land. Now going down. See you later. Good evening. Signed NC4.

SPARK AND ARC SYSTEMS TAUGHT AT RADIO SCHOOL

One of our most modern Pacific Coast schools is the Pacific Radio School in the Call Building, San Francisco, California.

This school was organized by Mr. A. S. Mackenzie, former Chief Electrician in the U. S. Navy and instructor at the Marc Island and Marshall's radio schools during the war. Mr. Mackenzie has opened this school to meet the demand for instruction in both arc and spark systems of radio telegraphy. Operators who have finished the course have secured licenses from the radio inspector showing that they are skilled in the theory and operation of both an arc and a spark transmitter. This has become of considerable importance to the success of operators in recent years.

A complete late model Federal Poulson Arc of 2 K.W. capacity has been installed at the school by Mr. Mackenzie. Wiring is all purposely in plain view to facilitate instruction. Spark transmitting instruction is given on a 1 K.W. 500 cycle Independent Wireless Telegraph Company's Transmitter. It is said that the Independent Company's installations will be the most popular spark transmitters in the future.

The buzzer practise tables will accommodate 25 students. A very unique system of master key and individual key control is used and students may either transmit to themselves or listen in on the instructor's transmitting. Receiving practise is also obtained on a late type Navy Receiver which is connected to an antenna 500 feet long and 200 feet high.

Lectures are given on Tuesday and Thursday nights by Mr. B. Harper on arcs. Mr. Harper is an expert on arcs from the U. S. Shipping Board.

NAVY SENDS GREETING MESSAGE TO AMATEURS FOR THE BOY SCOUTS

On February 8th at nine-thirty p.m. all the Twelfth Naval District Radio Stations broadcasted a message to all radio amateurs, sending greetings on the tenth anniversary of the Boy Scouts of America. It was requested that correct copy be mailed to the New York headquarters of the Boy Scouts of America, for which a souvenir booklet was to be sent.

NAVY TO ESTABLISH TELEPHONE CIRCUIT

It is understood that the Navy Department intends to install a telephone station at Avalon (Catalina Island), California, for communication with the mainland. This station, it is understood, will connect with the island telephone circuits, and the station at the mainland, which is to be at Long Beach, will be there connected to the land line of the Bell Telephone Company.

Classified Advertisements

ADVERTISEMENTS IN THIS SECTION ARE THREE CENTS PER WORD NET. REMITTANCE, IN FORM OF CURRENCY, MONEY ORDER OR STAMPS, MUST ACCOMPANY ORDER.

AMATEURS — Omnigraph, two pair Murdock phones, cheap. P. S. Burtchaell, 357 Ellis St., San Francisco.

WHAT have you to sell? What do you need? The RADIO EXCHANGE, 354 Perry, Oakland, Cal., sells your 2nd hand goods for you on a commission basis, 20%. We also have a complete line of radio goods at an astounding low price. Just send me your stuff, charges "prepaid."

AMATEURS—"WE HAVE IT"
Tested galena, large piece 90% sensitive $.20. Large piece 50% sensitive $.15. RADIO TESTING STATION, 25 Sturges St., Binghampton, N. Y.

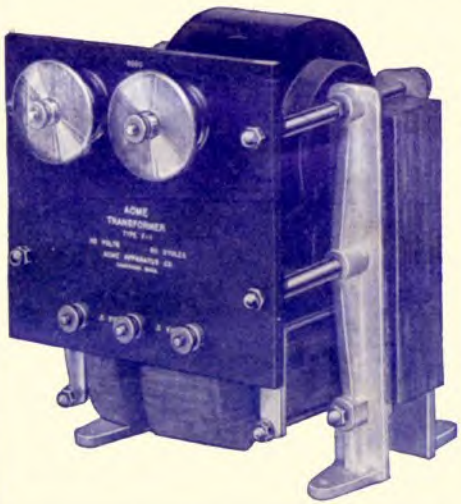
KODAKS AND SUPPLES
We develop and finish Vest Pocket 8 pictures 30c. 2¼x3¼ 25c. 2½x4¼ 30c. 3¼x4¼ 30c. 3⅝x4⅞ 35c. 3¼x5½ and post cards 35c. 12 exposures double. Packs add 20c to dozen prices. Frayne, Eureka, Ills.

SELL 5x8 printing press. A bargain. Equipment too if you want it. H. M. Huston, San Fernando, Calif.

Fourteen Points of an Acme Radio Transformer

1. Absolutely correct electrical design for Rotary Spark Gaps.
2. Draws a watt for every watt rating on condenser small enough for two hundred meter work.
3. High efficiency—85 to 90%.
4. High power factor, increasing efficiency and decreasing trouble.
5. Lower power steps for short distance work.
6. More miles covered per dollar.
7. Transmits longer distances without lowering spark note.
8. Non adjustable safety spark gaps.
9. Safety factor on insulation.
10. Material used, best money can buy.
11. Beautiful appearance—engraved Bakelite panel and open mounting.
12. Guaranteed against electrical breakdown.
13. Price low considering quality.
14. Stocked by leading dealers in high grade radio apparatus.

These Points have been Ratified by every Amateur who owns an Acme transformer.



ACME Apparatus Company

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