

A Magazine OF, BY and FOR Commercial Radio Operators and Technicians

Vol. 1

JUNE, 1931

No. 4



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“CQ”

DEVOTED ENTIRELY TO THE INTERESTS OF COMMERCIAL RADIO OPERATORS

CQ is published monthly by The CQ Publishing Co. and is the only publication
OF, BY and FOR licensed radio men.

M. R. RATHBORNE, Jr.

Editor

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Business Editor

Vol. I.

JUNE, 1931

No. 4

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THIS MONTH

Who said there was no money in marine radio operating? An operator who knows the ropes and takes on the proper SIDE LINES can soon attain financial independence (or board and lodging at the expense of the Government), by emulating “John D. Jr.”—who rose from radio operator to bank president. Read “John D. Jr.” and learn how that seagoing wizard of finance earned an income that often exceeded the salary of the captain of the ship on which he was employed. A true story that reads like fiction.

A New Department

“THE ROCK CRUSHER”

by

BILL BRENNIMAN

The First Installment Appears on
Page 7 of This Issue.

EDITORIALS

The following information, obtained from sources in Washington believed to be absolutely reliable, is of paramount importance to every American commercial radio operator interested in securing for himself the rights commonly accorded to other United States citizens.

"The Safety of Life at Sea Treaty may be acted upon at the next session of Congress but it is not expected that action will be taken before the end of the year as Congress does not meet until the first of December."

"Under the existing law as now construed, a radio operator's license can be issued to anyone who can qualify, regardless of nationality, age or sex. To remedy this situation, Congress would have to pass a law amending the present one. It is possible that if sufficient interest is shown in this matter by radio operators, Congress may make an effort to amend the existing laws so as to effect the changes desired."

"Such legislation usually originates in the Merchant Marine and Fisheries Committee of the House of Representatives and in the Interstate Commerce Committee of the Senate. If the republicans organize the House, it is probable that Honorable Frederick R. Lehlbach will be the chairman of the Merchant Marine and Fisheries Committee in the next Congress. If the democrats organize the House, the chairman may be the Honorable Edwin L. Davis."

"During the last Congress, the chairman of the Interstate Commerce Committee of the Senate was the Honorable James Couzens, who will probably be the chairman during the next Congress if the republicans organize the Senate. If the democrats have control, the chairman will probably be Ellison D. Smith."

"As all these men are likely to be away from Washington most of the time during the recess, it might be well to postpone writing to them on this subject until about the first of December. At that time if the operators will draw a bill containing the amendments they desire to have made in the existing radio law and submit it to the chairman of these two Committees, following it up with communications to other Senators and Representatives, it might result in consideration being given this matter at the next session of Congress."

"With reference to the code speed, this is based upon the International Radio Telegraphic Conference, which is scheduled to be held at Madrid, Spain, in the fall of 1932. The matter of experience necessary to obtain a commercial first class radio operator's license is also one that should be taken care of in the next International Radio Convention."

"As preparations are now being made for the next International Radio Conference it might be helpful to take the matter up with Mr. W. R. Castle, Jr., Under Secretary of State, State Department, and with the Honorable Wallace White, Jr., United States Senate."

The contents of the Safety of Life at Sea Treaty have not yet been made public in this country. We have received from England a copy of the Treaty as ratified by Great Britain. This document contains many provisions which, if adopted by the United States, would create hundreds of new jobs and materially improve working conditions for radio operators. As soon as the provisions of this treaty are made public by the State Department, we will publish the sections of interest to radio operators, and in addition, a special bulletin will be mailed to members of the EIGHT-HOUR CLUB.

If the sections of the Radio Law discriminating against radio operators are to be amended by Congress, we must all work together to bring pressure to bear on our Senators and Representatives—we must literally snow them under with letters demanding a revision of the Radio Act of 1927 and legislation abolishing the twelve-hour working day.

Those interested in obtaining an increased code speed for the second class commercial operator's license examination—twenty-five words per minute in plain language and twenty words per minute in code groups—as well as a two-year experience provision for first class licenses, are urged to write immediately to both Mr. W. R. Castle, Jr., Under Secretary of State, and Senator Wallace White, suggesting that the United States recommend these changes at the next International Radio Telegraphic Convention.—M. R. R.

Published by CQ Publishing Co., 1725 Bedford Road, San Marino, California. Yearly subscription rate \$1.50 in U. S. and Canada; \$2.00 foreign. Make all checks, drafts and money orders payable to CQ.

"JOHN D, Jr."

By Gilson Vanderveer Willets*

NOTE: Although "John D. Jr." was not even his nickname, he was the most extraordinary character that ever contributed to the history of wireless telegraphy. This is the inside story of his brief career in which the writer exposes a few of "John D.'s" many ruthless exploits in high finance.—G.V.W.

He was acknowledged one of the best wireless operators who ever sailed out of New York. Likewise, he was a brilliant financier—the only brass-pounder who eventually became a bank president.

The writer is obliged to conceal the protagonist's identity in this narrative for obvious reasons, although many old-timers who inhabited the old static-room at 25 Elm Street, will recall "John D. Jr." and his sensational exploits which invariably left the rest of us gasping for breath.

He came to New York from the hay fields of Westchester County early in 1913 and walked into the operators' school, announcing that he intended to take the course. His rural mannerisms made him the object of every conceivable kind of practical joke, but he took our banter good-naturedly and after spending six months in the "Ham Factory," he passed the examinations, and received his first assignment to sea before the ink on his ticket was dry.

There followed four never-to-be-forgotten years, during which scores of operators lost their jobs after trying to duplicate his financial successes. In every port where wireless men would gather, some one would invariably turn the conversation to "John D. Jr."—without the shadow of doubt he was the best known brass-pounder in the world. While the rest of us existed on a twenty-five to thirty-dollar a month salary, "John D. Jr.'s" income was seldom less than several hundred, and today he can sign a cashable check for a cool million and has the prettiest wife and finest kiddies in the Lone Star State.

Come on, you skeptics, and read how "John D. Jr." made his fortune as a wireless operator!

He was first assigned to one of the Red D liners running to the West Indies and South America. His senior had been on the run for a long time and was making

thirty-two dollars and a half a month, plus a few cents extra in commission for the sale of the Ocean Wireless News, which was merely a magazine into which mimeographed press sheets were inserted and the whole sold for ten cents. "John D. Jr." made one trip, studied the situation carefully, and the next trip commenced to teach his senior a few tricks that the latter had overlooked.

His first idea concerned the Ocean Wireless News. As soon as it became known that the wireless operators would pay a cent a copy for all returned books, the stewards unflinchingly salvaged them from the deck chairs and lounge seats, where passengers left them after reading the radio-press inserts. "John D. Jr." stored these away and on the return trip sold them a second time, using new inserts. The profits thus made amounted to nine cents a copy and the total gain for the trip was about twenty dollars, which, under the old system would have been about two dollars. Later, when "John D. Jr." became a senior in the trans-Atlantic trade, he frequently made from seventy-five to a hundred dollars a month in this manner. But, this was only the beginning—

He investigated the cable rates from various South American ports that the ship visited and found in some places that they were almost four times more than the radio rates via WST, Miami; so he solicited this business, claiming the radio would be faster and less expensive. He split the difference between the cable and radio rates and after two trips, he was making around three or four hundred dollars extra money a month.

The *modus operandi* was to visit the leading import and export houses and secure their cables; then as soon as his ship left the wharf and it came dark, he would shoot them in multiple to WST, sometimes spending the whole night breaking through static to do it. (That is one of the things that made old KDA so famous in the days when WST, Miami, and WSE, New York, were the busiest stations in the world.)

"John D. Jr." made from one to four dollars on every message and he handled hundreds of them every trip. He even

(Continued on Next Page)

*Former sea-going wireless operator and later chief executive of WOS, WOC, WRNY, WDBO and KFWI. Charter member of the Veteran Wireless Operators' Association.

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went so far as to visit the New York offices of the houses that refused to patronize him, and when he sailed again, he carried mandatory letters to the South American agents and thus increased his business.

He spent six months on that run and cleaned up around two thousand dollars. Later his senior operator was discharged for re-selling the Ocean Wireless News. You see, "John D. Jr." was very lucky.

His next job was that of junior on a large passenger liner running to Cuba and Mexico. He had lost out on his cable competition business, so he spent the trip looking for a new gold field, and found it upon his return when he learned that the world's series ball games would be played during his next voyage. His new idea required capital, and accordingly he drew all his savings from the bank on sailing day. As soon as the ship had cleared Scotland Light, he met with two confederates, whom he had employed to work with him, and turned over all his cash.

The average traveler forgets about the difference in time between shore and ship, but not so "John D. Jr."—who put this difference to work for himself on the second afternoon out, to the tune of three thousand dollars!

In the morning he published an announcement in the *Ocean Wireless News* that the inning-by-inning scores of the world's series would be posted in the smoking room. That afternoon he took the junior's watch as usual. His senior operator was not wise to the plans afoot.

"John D. Jr." tuned his receiver carefully and soon was jotting down the scores from WHA, WSY and WCY on his shirt cuff, while an anxious group of ball fans waited before the bulletin board in the smoking room. When he had the last score and knew who had won the game, he notified his confederates who immediately circulated among the passengers. Then the fun began—

While a frantic crowd rushed out on deck to peer at him through the open door of the radio shack, "John D. Jr." would lean dramatically over his desk, snatch a pencil, then pressing the phones tightly to his ears he "copied" the score on a standard radio blank. The minute he finished, he would jump up and dash out to the smoking room and post it, returning to his desk and repeating the procedure while excited throngs pranced about and cheered the imaginary game.

Most of the first-cabin passengers were very wealthy and prone to indulge in gambling. His men had no trouble placing bets. When the last inning had been posted they had only to collect. Net result,

three thousand dollars as "John D. Jr.'s" share after all expenses were paid. He did this three times while going down the coast and cleaned up around eight thousand dollars.

The next trip his senior shared with "John D. Jr." a severe bawling out on the carpet from the Marine Superintendent and they were both demoted to one-man ships for re-selling the *Ocean Wireless News*.

His next assignment was an oil tanker running from Bayonne, New Jersey, to Tampico, Mexico, and as usual he made one voyage and studied the situation. There was no opportunity to compete with cables, overcharge for messages, re-sell press books or swindle passengers, but this did not deter "John D. Jr." from making another fortune.

When the tanker returned to Bayonne, he went to his bank and withdrew ten thousand in cash, which he took back to Mexico with him. At that time the Mexican peso was worth a few cents more than the silver dollar, so "John D. Jr." changed his ten thousand American dollars into Mexican pesos and smuggled them aboard the ship. When he reached New York he sold the pesos at considerable profit and returned to Mexico with another ten thousand American dollars. After three trips, his profit amounted to around five thousand dollars and there it stopped.

He was not the only man profiteering this way, so the Mexican government called in all their pesos, issuing new ones with more alloy and less silver. Shortly afterwards, his employers, evidently thinking that "John D. Jr." had been sufficiently punished with ample time for repentance, transferred him to a small passenger liner running to Key West and Galveston.

He only made one trip on that ship, but when he came home he deposited over five hundred dollars in addition to his salary. While his ship was in Galveston, the city was swept by a devastating flood which paralyzed all land wires, and the only means of communication with the outside world for several days was by means of radio. As the "beach station" had been wiped out, press despatches were piled high on the desks of every ship in the harbor, but "John D. Jr." made capital out of disaster, by re-writing all press messages filed with him and sending them at his own expense to a certain press syndicate which paid him a handsome sum for them when he returned. He also sent the original messages, of course, but not until after he had sent his own despatches to a competing news syndicate. On top of that, the Galveston office paid him a fifty-dollar bonus, in ignorance of its double-crossing deals.

(Continued on page 12)

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THE DECIBEL

By MERVYN R. RATHBORNE

PART ONE

The ratio known as the decibel, expressing the relation between two quantities of electrical power or sound intensity, is continually used by sound technicians and operators in broadcasting stations. It is hoped that this explanation will be of value to newcomers to the technical fraternity of radio men and to the Old Timers who have not had broadcast station or sound studio experience.

Two amounts of power, P_1 and P_2 , are said to differ by one decibel when they are in the ratio of 1.259, or $\frac{P_2}{P_1}=1.259$, where P_2 is the larger and P_1 the smaller power. (If gains are to be computed, P_1 will represent the input power and P_2 the output power.) The ratio between two electrical powers or sound intensities measured in decibels is equal to ten times the logarithm of the larger power divided by the smaller power or:

$$\text{No. of decibels} = 10 \times \text{Log} \frac{P_2 \text{ (Larger Power)}}{P_1 \text{ (Smaller Power)}}$$

It should be clearly understood that the decibel is a RATIO and does not represent any definite quantity of power; it is purely an arbitrary standard for expressing the ratio between two amounts of energy. To attach an absolute value to the decibel would be the same as attempting to use a fraction, such as $\frac{1}{2}$, by itself to represent a definite quantity. It cannot be said that a certain object cost $\frac{1}{2}$ without stating the unit of money, such as a dollar, cent, kopek, or ruble, to which the fraction refers. Likewise, it is impossible to say that a certain piece of radio apparatus has a power output of 6 decibels, for 6 db does not represent a definite quantity of power.

The decibel expresses only the RATIO between two known amounts of input and output power. However, a definite value, such as .006 watts (used by W.E.), may be chosen as a reference point (zero level). When a zero level of known value is used the number of decibels above or below this point will indicate the actual power level.

LOGARITHMS

A working knowledge of the common, or Briggs, system of logarithms should be acquired by the student before attempting to solve problems involving the decibel.

For the benefit of those not familiar with logarithms we shall attempt a brief explanation of this branch of mathematics.

The expression 10^2 means that ten is raised to the second power, or squared. The small 2 indicates the power to which 10 is raised and is called an EXPONENT. Exponents are often used to indicate a multiplication or division where the actual operation has not been performed. The example above can be written as 10^2 , or 10×10 , or 100. Also 10^3 can be written as 10^3 , or $10 \times 10 \times 10$, or 1,000, and so on. If a certain value is taken as a reference point, or base, any numbers can be expressed by exponents. In the system of common logarithms 10 is used as a base and all other numbers are expressed as exponents, or powers, of 10. Thus we find, that logarithms are nothing more or less than exponents. In the above example we found that $10^2=100$; now if we express 100 as a power of 10, we may say that 100 is the second power of 10, or the logarithm, to the base 10, of 100 is 2—this is usually written: $\text{Log } 100=2.0000$. Also, 1000 equals the third power of 10, or 10^3 , and the logarithm of $1000=3$. The following table will assist the beginner in finding the logarithms of multiples of 10.

TABLE 1

$1=10^0$; therefore, $\text{Log } 1=0$
$10=10^1$; therefore, $\text{Log } 10=1$
$100=10^2$; therefore, $\text{Log } 100=2$
$1,000=10^3$; therefore, $\text{Log } 1,000=3$
$10,000=10^4$; therefore, $\text{Log } 10,000=4$
$100,000=10^5$; therefore, $\text{Log } 100,000=5$
$1,000,000=10^6$; therefore, $\text{Log } 1,000,000=6$

From Table 1 it is evident that the logarithm of any number between 1 and 10 lies between 0 and 1; the log of any number between 10 and 100 will be between 1 and 2, etc. Table 2 gives the numbers between 1 and 1,000,000 that have even numbers for their logarithms.

Using Table 1, let us work a few simple problems with logarithms. Suppose we wish to multiply 100×100 , we know that $100=10^2$ and the $\text{Log of } 100=2$. If we express 100×100 as $10^2 \times 10^2$ it is only necessary to add the exponents in order to perform the multiplication, thus: $10^2 \times 10^2 = 10^{2+2} = 10^4$.

(Continued on Next Page)

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TABLE 2

$\left\{ \begin{array}{l} 1=10^0, \text{ and Log } 1=0 \\ 10=10^1, \text{ and Log } 10=1 \end{array} \right.$	Therefore, the logs of all numbers between 1 and 10 will lie between 0 and 1.
$\left\{ \begin{array}{l} 10=10^1, \text{ and Log } 10=1 \\ 100=10^2, \text{ and Log } 100=2 \end{array} \right.$	Therefore, the logs of all numbers between 10 and 100 will lie between 1 and 2.
$\left\{ \begin{array}{l} 100=10^2, \text{ and Log } 100=2 \\ 1,000=10^3, \text{ and Log } 1,000=3 \end{array} \right.$	Therefore, the logs of all numbers between 100 and 1,000 will lie between 2 and 3.
$\left\{ \begin{array}{l} 1,000=10^3, \text{ and Log } 1,000=3 \\ 10,000=10^4, \text{ and Log } 10,000=4 \end{array} \right.$	Therefore the logs of all numbers between 1,000 and 10,000 will lie between 3 and 4.
$\left\{ \begin{array}{l} 10,000=10^4, \text{ and Log } 10,000=4 \\ 100,000=10^5, \text{ and Log } 100,000=5 \end{array} \right.$	Therefore, the logs of all numbers between 10,000 and 100,000 will lie bet. 4 and 5.
$\left\{ \begin{array}{l} 100,000=10^5, \text{ and Log } 100,000=5 \\ 1,000,000=10^6, \text{ and Log } 1,000,000=6 \end{array} \right.$	Therefore the logs of all numbers between 100,000 and 1,000,000 will lie between 5 and 6.

If we look up the value of 10^4 in Table 1, we find the answer to be 10,000. Now, let us work this problem by using logarithms.

Problem No. 1—Multiply 100×100 using logarithms:

Log 100	2.0000
Log 100	2.0000
Log of answer, or antilog.....	4.0000

If we look in Table 1 for the number whose logarithm is 4, we find 10,000 to be the answer.

RULE: Add Logs to Multiply.

Problem No. 2—Divide 10,000 by 100 using logarithms:

First we will solve this problem by expressing the numbers as exponents of 10. Table 1 tells us that $10,000 = 10^4$, and $100 = 10^2$. If we write this problem as $\frac{10^4}{10^2}$ it is only necessary to subtract exponents in order to perform the division, thus, $\frac{10^4}{10^2} = 10^{4-2} = 10^2$. We already know that $10^2 = 100$, which is the answer.

Using logarithms, 10,000 is divided by 100 in the following manner:

Log 10,000	4.0000
Log 100	2.0000
Log of the answer, or antilog..	2.0000

If we look in Table 1 for the number whose logarithm is 2, we find 100 to be the answer.

RULE: Subtract Logs to Divide.

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Now that we can use a simple table of logarithms let's try something a bit more complicated. Table 3 is a portion of an actual four-place log table. With its help we can soon learn nearly all there is to know regarding the practical application of logarithms.

Perhaps the easiest way to learn to use this table is to try and find the logarithm of some number, say 113. By inspection we find that 113 lies between 100 and 1,000, this tells us that its logarithm will be greater than 2 and less than 3, as shown in Table 2. The first step is to write—Log 113=2.+ . Now, if we refer to Table 3 and look for 113 we find its first two digits, 11, in the left-hand column, headed N (meaning, number). The first column to the right of the N column is headed 0, the number opposite 11 in this column is the decimal part of the logarithm of 110; in the next column, headed 1, will be found the decimal part of the logarithm of 111, and so on across the page. In the column headed 3, opposite 11, we find the number 0531, which is the decimal part of the logarithm of 113. This 0531 is the number we must add to 2 in order to obtain the log of 113. We have already written—Log 113= 2.+; if we add the 0531 to the 2 we get—Log 113= 2.0531, which is the same thing as stating that $113 = 10^{2.0531}$; for we know that in the system of common logarithms all numbers are expressed as EXPONENTS, or powers, of 10.

(Continued on page 14)

ATTENTION BROADCAST

AND AIRWAYS OPERATORS

Don't forget that CQ is published for your benefit. Articles, items and stories are needed. Let's hear from you.

BREAKS

by
THE SKIPPER

I have recently received a copy of the 1931 Souvenir Journal published by the Veteran Wireless Operators' Association—a fraternal organization of old-time radio men, founded for the following purposes:

"To foster and extend an esprit de corps among wireless operators."

"To afford opportunity for social intercourse, and to promote a fraternal and comradely sentiment among its members."

"To recognize meritorious service rendered by wireless operators on land, at sea, and in the air, by the erection of memorials and by the bestowal of testimonials, medals, scholarships, and other suitable awards."

"To acquaint the public with the work, traditions and ideals of wireless operators and to perform and encourage any other purely fraternal activity or activities adjudged helpful to the wireless profession."

The aims of this organization are highly commendable and I believe every radio operator who is at all interested in fostering the ideals and traditions established by pioneer wireless operators should become a member of the V.W.O.A. To be eligible for membership as a Veteran an operator must have had at least ten years' experience; however, any radio operator who has been employed as such, either by a private concern or by the Government, is eligible for Associate Membership. If you are interested, and wish to learn more about the V.W.O.A., write to the Secretary, 154 Nassau Street, New York City. Enclose fifty cents and you will receive a copy of the Souvenir Journal.

* * *

Incidentally, the V. W. O. A. has been established for six years and has a membership of nearly a thousand.

* * *

Andrew W. Mellon, Secretary of the Treasury, recently told a group of business men in Washington that reducing wages was in his opinion one of the best ways to prolong the present depression. When one of the world's richest and most conservative men makes a statement of this sort the lesser fry should at least give it some thought. Incidentally, Mr. Mellon is usually right, he predicted the stock market crash and the unpleasant consequences which followed. * * *

Another Cabinet member, Secretary of Labor Doak, has issued a statement that the administration will exert every effort

toward preventing a widespread reduction in wages. He is of the opinion that the workers would be justified in combating such action on the part of employers with every means at their disposal, including strikes.

* * *

Canadian radio operators employed by the Marconi Company are organized as a subordinate unit of the Commercial Telegraphers' Union of North America, affiliated with the American Federation of Labor. A written agreement, now in effect between the Marconi Company and the Union, secures for Canadian operators many advantages that we are unable to enjoy. Here are a few excerpts from the agreement:

"A Telegrapher aboard ship shall hold the title of Wireless Officer."

"The Company undertakes to insert in its future agreements with shipowners, for the provision of Telegraphers' services, a clause providing that the shipowners shall furnish Wireless Officers with medical and other attendance and comfortable sleeping accommodations in accordance with the terms of the ship's articles, and where more than one Wireless Officer is employed, to provide sleeping accommodations for them in a suitable room separate from the wireless cabin."

"Generous effort shall be made to grant vacations of uncertain and variable duration with full wages as per scale to ship's Telegraphers who have been on extended voyages and who have been unable to secure shore leave for a prolonged period, such vacations to take effect immediately upon their return to their Divisional Headquarters."

"No Telegrapher shall be suspended except for investigation and no Telegrapher shall be disciplined or discharged until his case has been investigated and he has been proven guilty of the offenses charged against him. Any Telegrapher who has been suspended and disproving the offenses charged against him, shall be reinstated and reimbursed for all loss of pay."

"The Company shall be required, in the event of reduction of staff, to give fifteen days' previous notice in writing and acknowledgement of the receipt of such notice shall be sent without delay to the proper authority."

"The right of seniority shall govern in all cases, ability, technical and otherwise, being equal."

"All seniority shall be determined by accumulated service and seniors under this clause, who have the requisite ability, technical and otherwise, shall be eligible, for, and shall receive consideration in the matter of appointments to the higher positions in the service."

(Continued on page 13)

"I SAW YOUR AD. IN CQ." Tell this to our advertisers—it helps all of us.

BREAKS

(Continued from page 7)

PERSONAL ITEMS

Congratulations are due to T. J. Findley, well-known Pacific Coast marine op, who was recently issued Extra First Class License, No. 42.

* * *

Jimmy Ball, formerly of KFS, is now second on the H. F. Alexander; he holds pink ticket No. 43.

* * *

On December 13, 1912, Commercial Radio License No. 1 was issued to Charles J. Pannill, now Vice-President of the Radiomarine Corporation.

* * *

Paddy McGrath, on the RMS Caronia in 1922; Operator Knight formerly with the United Fruit and serviceman for Corwin Radio in 1928; and Operator Gifford, ex-Navy, with Corwin Radio and De Forest in '28, are requested to QSO Bernie Stahl, WPAP, Palisades Amusement Park, Palisade, New Jersey.

* * *

Bill Breniman is with the Airways Service at Big Spring, Texas.

* * *

Johnny Oldaker, long connected with Mackay, has returned from a two-year stay at KNN, Honolulu, and is handling a high-freak circuit at KFS.

* * *

I wonder if Stedman Fiske Todd will follow Captain Anderson to the new Dollar Liner "President Hoover," or if he will prefer to stay with his present ship, KDSV, the "President Wilson."

* * *

I would like to hear from "Red" Evans, former Lasso and Matson op.

* * *

Also Sidney Peters, Dick Johnstone, Gerald Whitaker and Oscar E. Darling, all oldtimers for whom inquiries have been made.

* * *

Another operator wants to know the whereabouts of Phil Thorne, "Poker" Jones of Pacific steam-schooner fame; Earl and Ray Diamond and the Kelly who tried to drink Manila dry while on the tanker "Stockton" a few years ago.

* * *

I have received the report that Stanley Young is chief on our largest ship, the "Levi." Confirmation please, also the names of the rest of the staff on WSBN.

(Continued on page 16)

PIONEER RADIO OPERATORS

By Dr. Lee de Forest

(Continued from May)

Barnhardt's first duty was to lure a confederate away from Western Union or Postal, because my second installation at the old Hotel Castleton, Staten Island, seven miles across the bay, was already under way and "big doings" were in the offing. There was grave doubt in the minds of almost all interested as to what unknown difficulties must be first overcome before wireless could span this great gulf of ether. Up to that date, signalling across the Hudson River, from Jersey City to the roof the Bowling Green Building, New York City, had been the limit of accomplishments.

One day in the spring of 1902, Barney brought a stocky young man, bespectacled and keen of mein, Harry Mac Horton by name, as one willing and eager to quit his lucrative press-wire job for the lure of wireless. To us, Horton soon dropped the Harry and became just good plain "Mac"; and his fat salary for an enthusiastic, whole-souled, unselfish devotion to his new mistress (and to "Doc") which I have never seen surpassed, if equalled, in all my subsequent experience with countless numbers of wireless, and later Radio, operators and engineers. Mac Horton was for "De Forest Wireless" 1,000 per cent, day and night.

And HOW he could send! No sooner had we finally established a two-way communication between Battery Park and Staten Island than Mac and Barney began to clip off that good old American Morse and Phillips' Code at the rate of 30 to 40 words per minute, with zest and enthusiasm unequalled since the early days of young Tom Edison. Nothing could stop them—not static or transformer break-downs. I've actually seen Mac copying messages of greeting from some New York financier to his enquiring friend down at Staten Island for twenty minutes after the New York transmitter had blown up!

That was "Wireless" indeed. "Never say die," and "You can't stop a Yank," were Horton's pet phrases, and he eternally embodied their spirit as long as he worked for me. That youthful spirit of enthusiastic devotion to duty and their new profession took full possession of almost every operator who, one by one, joined the slowly enlarging wireless circle.

* * *

(Dr. deForest's account of the early days of "wireless" will be continued in the July issue.)

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THE ROCK CRUSHER

Ground by William A. (Bill) Breniman

(Editor's Note: Operators who remember the "Brasspounder's Department" published in *Radio* a few years ago will need no introduction to Bill Breniman, who is unquestionably one of the best known and most popular members of the fraternity of Old-Time Seagoing Brasspounders. We are pleased to announce that Bill has consented to edit this new department, in which he will be permitted to express his ideas and views on the whys and wherefores of radio operating and operators with absolute freedom, even though his opinions may not agree with those held by the Editor.)

* * *

Well, all I know is what I read in the paper and hear operators squawking about—Guess I'll have to apologize to my friend Mr. Will Rogers for stealing his thunder but you see since the editor has asked me to take over this page, I haven't decided whether to turn "Columnist" or turn my department into a battleground for the "intellects."

Most operators do most of their seagoing and radio operating ashore or in the static-rooms and when they shove-off to sea they start farming. More gardens and chickens have been raised at sea than ever grew ashore—which all goes to prove that your editor has attuned his brains to the fine vibrations of intelligence when he picked on yours truly as a committee of one to discourse on things nautical—especially since I am about a thousand miles now from any man's ocean.

Well be that as it may—I think we have reason to be thankful that we at last have a publication that is dedicated in perpetuity to the service of the operator and the operating profession, that our worthy cause shall not lack a champion and that evil influences against the standing of the craft shall not thrive unopposed.

The Editor has kindly given me free range to convey thoughts and ideas as I see them even though they may not agree with those of the editorial staff—that is what makes it interesting—I have always felt it better to start a man thinking even though he disagrees with me. Before deciding where we go from here—we must first find out where we are and that can only be accomplished by an exchange of ideas.

Ideas are one thing this publication needs—aside from the natural desire of us all to improve our standing and conditions—good constructive articles and ideas that are helpful and will benefit us all—along most every line, useful to the operators should be most welcome. If we swap dol-

lars we both still have a dollar, but if we trade ideas we will both have two ideas—enriching us both.

* * *

Following the lines of least resistance never landed anyone in a soft spot. I think this is the trouble with the radio profession in general. Too many take up radio, not as a means of making a living, but a means to an end, and that end is the highly colored picture of travel, adventure and life of ease pictured by entirely too many radio schools. It appeals to the imagination as nothing else would. Utopia for a life of ease is supposed to be the life of a marine radio operator.

It is my belief that the duties of a radio operator and that of purser or freight-clerk should be welded into one position with exception of passenger ships where they could not both be looked after by one office. With the railroads the position of telegrapher and station agent is generally combined into one good job. There are quite a number of schools throughout the country teaching railway telegraphy and they always teach the station agents work in conjunction. It might also be said that they are also quite well paid, better than commercial Western Union or Postal operators, as an average.

By combining the two positions the operators should receive more pay. They would not be imposed upon because they would be paid to do this work. I also believe it would also be the avenue to better positions. The Steamship Company has nothing much in common with the ordinary radio operator, but a man who understands the paper work of the steamship company and fits in more with the organization would be considered for higher positions. The office of Operator-Purser, or Operator-Clerk on the ship would also command a little higher prestige. It is my idea that schools should include a course in paper work for pursers or freight-clerk for the operators when they go through these institutions of learning. The main trouble I might guess is that they do not know the work themselves and are not qualified to teach it.

From my observation, radio operators as a class are more proficient with the typewriter and as a general rule have had more education than most of the men who go to sea as pursers or freight clerks. There is no valid reason why they can not do this and make the extra money.

(Continued on page 19)

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CORRESPONDENCE SECTION

Signed communications only will be accepted for publication in this section, names of correspondents will be withheld on request. The publishers of CQ assume no responsibility for statements made herein by correspondents.

★ ★ ★

Here is an exact copy of a letter, dated April 15, sent by the Tyler Commercial College of Tyler, Texas, to a number of broadcasting stations throughout the country:

Gentlemen:

Just recently we graduated several young men in the Radio Broadcasting and commercial classes. Each of these young men are 21 years of age, high school education and some college training. Each holds a radio Operator's license, Commercial Second Class.

One of these young men is desirous of securing employment in your station as a plant Operator or studio Operator or an announcer, and would be willing to sell radio advertising when he is not on duty at the Station.

This young man has not been taught several months of radio theory just to make a radio operator's license but has been put to an "acid test" in maintaining and operating the most complicated circuits in radio broadcasting. He has been put to the test in the wiring of switchboards such as found in all studios, has worked on speech amplifiers without any assistance from the instructor and has always had these circuits working within a reasonable length of time. This young man is also qualified as an announcer with a voice that is pleasing to the public and has not been trained to use his voice unnaturally in any way. He has been given by the Tyler Commercial College a thorough course in Business English, Salesmanship and Practical Psychology, which should help him with his announcements and also selling of radio advertisements. He writes fifty net words per minute on the typewriter.

I assure you, Gentlemen, that pains have been exercised with each of these young men to make them as efficient and well qualified as a man with two or three years' experience.

This young man would be willing to start at your lowest starting salary in order to prove his efficiency to you, and, of course, would be more than glad to accept any position that you have to offer. If you are in immediate need of such a young man, please wire me collect and I will have him report to your station within

3 or 4 days. If you can use this young man and he does not prove satisfactory to you, he is willing to bear his own expense and charge you nothing for his services.

Thanking you for any consideration shown me in regard to this employment, I am

Respectfully yours,
(Signed) CHARLES L. DANIEL,
Supervisor of Radio,
Tyler School of Radio.

To anyone who is interested in paying for the privilege(?) of working in a broadcasting station and who may wish to become an operator, technician, typist, salesman, psychologist, announcer, we unreservedly recommend the School of RADIO operated by the Tyler COMMERCIAL College and School of BUSINESS ADMINISTRATION, of Tyler, Texas, U. S. A.

INFORMATION WANTED ON MARINE DISASTERS

For purposes of recording in permanent form the correct and complete stories of the outstanding sea disasters in which radio figured prominently, or radio operators lost their lives on the Pacific Coast, the editor is extremely desirous of getting in touch with any of the following:

H. F. Wiehr, who was junior on the "Admiral Sampson," when Reker was lost.

Loren Lovejoy, Chief of the "Hanalei" sinking in which A. J. Svenson was lost.

The junior operator or anyone able to tell the story of the loss of the "State of California" with Donald Perkins.

Jack Irwin of airship "America" fame.

Also anyone able to supply details, logs, clippings, reports, or other information on the following shipwrecks:

Loss of the:

S.S. "State of California," Aug. 18, 1913
—D. C. Perkins lost.

S.S. "Rosecrans," Jan. 7, 1913—Lawrence Prudhont lost.

S.S. "Francis Leggett," Sept. 18, 1914
—C. D. Fleming, H. F. Otto, both lost.

S.S. "Hanalei," November 23, 1914—A. J. Svenson lost.

S.S. "Admiral Sampson," Aug. 25, 1914
—Walter Reker lost.

P.M. Carferry No. 18, Sept. 9, 1910—S. Sczpanck lost. (Great Lakes.)

S.S. "Ohio"—Eccles lost.

All material will be carefully protected and promptly returned. Please communicate with the Editor as soon as possible.

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EMPLOYMENT REPORTS

ATLANTIC COAST

New York—

"Employment conditions in radio appear to be unchanged here and the number of unemployed here in all lines of work seems to be greater than on the West Coast."

* * *

"Employment in New York has never been so slack, about 70 experienced men on the list at RCA, who will not accept any new applications. About 200 RCA Institute graduates with brand new yellow tickets, RCA will not even put their names on the list due to the surplus of experienced men who are glad to take any job that comes up. RCA now creating temporary jobs, particularly on short-run ships, by having operators take a couple of weeks off, or a trip off. Average wait in static room three months or more, with very few permanent jobs available—lots of these going out the back door. The fund of \$500, which was being used for food and room rent for operators who went broke, was used up some time ago. When those who had received help and got jobs wished to repay what they had used up from the fund, RCA refused to accept repayment. As a result, the fund is gone and there are no prospects of its being renewed. The U. S. Liner "Republic" has been laid up again. The "Minnehaha" will sail on May 30th, after a seven-month layup."

"Mackay and Tropical have many applications but no jobs to offer. Some of the small number of Mackay ships are laid up with operators standing by. The Government Airways Service employs a few operators occasionally."

* * *

These two reports apparently express the consensus regarding conditions in New York. As is the case on the Pacific Coast, there seems to be a general trend toward lower wages in the East. In addition to those published last month, a number of new wage cuts have been reported, none of them exceeding ten per cent.

* * *

We would like to receive reports from operators sailing out of Philadelphia, Baltimore and Boston.

Gulf—

* * *

In the Gulf section there are approximately
(Continued on page 18)

PACIFIC COAST

Reports received from Seattle, San Francisco, and Los Angeles show that there is very little change in employment conditions on the Pacific Coast this month. Apparently there is a slight redistribution of the unemployed, with more operators finding work in the Northwest and a greater number out of work in the South. Conditions have improved slightly in Seattle but there are still more than 50 operators on the beach in that section. In San Francisco conditions are terrible; there is real distress among unemployed operators in that city. Here are excerpts from a few of the reports received. An operator in Los Angeles writes: "Have been on the beach for the past five months, radio is certainly a glorious profession when a man with nine years' RCA service cannot get an assignment in five months." An operator dropped into Headquarters last week and told us of this experience. After hanging around the static rooms in San Francisco until he was down to his last dime, he was finally assigned to the Admiral Dewey, operated by the Pacific Steamship Company. He was made to go deadhead (without pay) from that city to Portland, then he had to lay around there for four days until he was signed on and his pay started. From Portland he made a trip down the coast and back to San Francisco where he was laid off. He stood by the ship and again went deadhead to Portland, where he was signed on once more. The result was that he spent nearly three weeks of his time in order to earn \$35.00, and he was obliged to stand-by the ship while not on the articles.

There seems to be a general tendency among employers to reduce wages. The staff of KFI has been cut ten per cent. A report from San Francisco says that Mackay Radio has cut wages ten per cent and cancelled all vacations. Other reductions, too numerous to mention, have been made in the salaries of operators employed in small broadcasting stations.

* * *

Here is a copy of the postcard that the new radio school in San Francisco is sending to amateurs in the Bay Region:

"Sa OM. Is it worth a few weeks of ur time and \$35.00 to fit yourself for a commercial ticket and jobs paying from \$150

(Continued on page 20)

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"JOHN D. JR."

(Continued from page 4)

After the Galveston affair, he was made senior on a coastal vessel running between New York, Charleston and Jacksonville. While he was on that ship, I made one trip with him as junior . . . but that was later. As usual, he made the first trip and looked the situation over.

He figured that a ten-word radiogram to any point in the United States could not exceed two dollars and fifty cents, so he made up fifty raffle tickets which he sold to passengers at twenty-five cents each. When the lucky number was drawn, its holder was entitled to send a ten-word message to any point in the United States. The minimum profit on each raffle was ten dollars and he sometimes arranged three or four a day. His second operator tried it one time when "John D. Jr." was taking a trip off, but a company official was on board and the junior was fired. It was at this time that I had the opportunity of making a single voyage with the greatest operator of the day. What a trip!

We left the static room and took a taxi down to the ship. This was a novel experience for me, who was accustomed to lugging my heavy bags about like other poor chaps who followed the wireless game.

En route, we stopped at a cigar factory on West Street where "John D. Jr." purchased two boxes of the blackets, vilest, most evil-smelling cigars that I have ever seen. He smiled enigmatically when I asked who was expected to smoke them.

When we put to sea, he took the first watch and I remained in the shack with him, not wishing to turn-in before supper. He opened his box of stogies and placed a row in his vest pocket. Presently a prosperous-looking passenger edged up to the door and commenced the usual volley of silly questions. The wind was strong in the Narrows and I noticed, when it blew back the passenger's coat lapel it revealed cigars in our visitor's vest pocket.

"John D. Jr." also noticed them and with a great gusto and diplomacy, he offered our caller one of those vile stogies which he had purchased that afternoon. The passenger had the grace to accept it, but he put it in his pocket, explaining that he would "smoke it later." Then he courteously proffered both "John D. Jr." and myself cigars selected from his own pocket. These proved to be excellent smokes of a well known fifty-cent brand.

"Not so bad!" remarked my senior as we lit up. "My cigars are two for a nickel; his are fifty cents. It's easy enough to get the best there is in the world if you know how to do it. What do you say?"

I had nothing to say.

When "John D. Jr." called me at midnight to go on watch, I asked him if he would loan me his tooth paste. He handed me a new tube and said:

"Keep it. I get all my toilet articles free." In response to my puzzled expression he added: "It's easy; I clip the coupons on all the ads and send for free samples."

That trip we had all the good cigars we could smoke at a cost (to "John D. Jr.") of two and a half cents each. We lived in a most sumptuous suite of rooms in the Seminole Hotel in Jacksonville, with absolutely no expense to ourselves, because "John D. Jr." had made arrangements with the management to send them radio reservations from passengers, accepting them free and collecting each trip from the hotel. He did the same with the Biltmore in New York. He even made a few additional dollars on this deal by grouping the reservations, but charging the hotel for one message for each guest.

We ate on board the ship and that cost us nothing. It was a great life. At that time, "John D. Jr.'s" salary was thirty dollars a month, but even on that crazy coast run he was making over two hundred, with free hotel, free food, free everything. He even bought baby alligators in Jacksonville for a dollar each and sold them in New York at from two to three hundred per cent profit. He had a winning personality that captured the hearts of all who knew him and it clothed his ruthless, scheming, cheating character so well that he always got by.

Before I bring this to a close, I must relate one incident that I understand happened to "John D. Jr." while he was still on the Jacksonville run. One day he missed the ship when she sailed for Charleston, but by means of communicating with his junior through old WJX, he ascertained that the skipper did not know of his absence. The junior advised him to hurry by rail to Charleston and catch the boat there. However, "John D. Jr." did not have a cent with him for carfare. Did he worry? I'll say not!

He strolled down Bay Street to a pawnbroker's, hocked his uniform for thirty dollars and spent five of that for an old suit. Then he found a big clock store, and through that intriguing personality of his, plus twenty-five dollars down payment, he bought a large mantel clock worth a hundred and fifty dollars. Then he visited a second pawnshop and hocked the new clock for sixty dollars after which he went back to the first shop and redeemed his uniform. He sold the shop-keeper back the old suit for two dollars and fifty cents and then with thirty-seven dollars and a

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half in his pockets, he took the night express for Charleston, where he boarded the ship before she sailed, with no one the wiser. In New York he quit the ship and announced his desire for a west coast run.

Two trips on a west coast freighter that stopped at all ports from Punta Arenas, Costa Rica, to Salina Cruz, Mexico, netted him a profit of over a thousand dollars on shoes, perfumes and pretty silk lingerie for the ladies. He sold his things directly from the radio cabin and had his own way with the Aduaneros who are always susceptible to flattery and bribes.

Later, he was assigned to a New Orleans passenger ship, and for a second time was caught re-selling the Ocean Wireless News. His excellent record saved his job, but he was again demoted to a one-man freighter, on which he could discover no way to make extra money for three trips and was about to quit when he met a banker's daughter.

The courtship was fast, and after three more trips he kissed the captain farewell, wept on the chief engineer's shoulder, sent the marine superintendent a saucy resignation and strode ashore to a waiting limousine which took him to the brilliant wedding, at which everybody in New Orleans' "four hundred" was present. It was a gay affair and as a result, "John D. Jr." became firmly entrenched in one of the wealthiest families of the south.

BREAKS

(Continued from page 7)

"A uniform allowance of \$45.00 for each year of service shall be payable to ship's Telegraphers where uniforms are required to be worn by ship's regulations. . . . Trim-mings shall be supplied free of charge by the Company and shall remain the property of the Company."

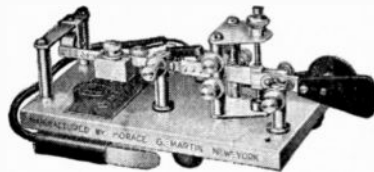
"Two weeks' leave of absence, with full wages and maintenance allowance as per scale, shall be due to Telegraphers upon completion of one full year's service at Coast Stations, and yearly thereafter."

"In the event of a Coast Station being short staffed, overtime for extra duty in excess of eight hours per day shall be paid at the rate of time and one-half of the regular daily wage, inclusive of maintenance allowance."

The agreement also contains a definite wage scale, increasing with each year of service. It seems ridiculous that the comparatively small number of Canadian operators can secure these advantages while we are forced, in many cases, to work long hours for low pay under unfavorable conditions.

**New Easy-Working
Genuine Martin No. 6
VIBROPLEX**

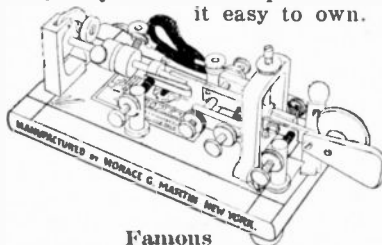
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The New, Easy-Working Vibroplex has many improved features not to be found in any other bug. Thousands of delighted users say it is the smoothest, easiest-working bug ever made. Its easy manipulation will surprise you. Its superior quality of signals will delight you. Ideal for the operator desiring a sharper, clearer and more uniform signal. Adjustable to any speed. Built not only to stand the gaff, but to make sending easier and better for every operator. If you want the best—get a NEW, EASY - WORKING Genuine Martin No. 6 Vibroplex NOW! Our liberal trade-in allowance on your old Vibroplex makes it easy to own.



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Used by tens of thousands of Radio and Morse operators because of its ease and perfection of sending. Black or Colored, \$17; Nickel-Plated, \$19.

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The Vibroplex Co., Inc.

825 Broadway New York, N. Y.

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THE DECIBEL
(Continued from page 6)

TABLE 3*
Partial Table of Logarithms

N	0	1	2	3	4	5	6	7	8	9
10	0000	0043	0086	0128	0170	0212	0253	0294	0334	0374
11	0414	0453	0492	0531	0569	0607	0645	0682	0719	0755
12	0792	0828	0864	0899	0934	0969	1004	1038	1072	1106
13	1139	1173	1206	1239	1271	1303	1335	1367	1399	1430
14	1461	1492	1523	1553	1584	1614	1644	1673	1703	1732

In order to become more familiar with Table 3, let us find the logs of several numbers.

Problem No. 3—Find the logarithms of 111, 1150, and 1.2.

(a) First we must find the whole number, or characteristic, of the log; 111 is between 100 and 1,000, so its log must be greater than 2 and less than 3. (See Table 2.)

Whole number - - - Log 111=2.+
Decimal - - - - - Log 111=.0453

Log 111=2.0453

Table 3 gives the decimal part of the log of 111 as 0453; therefore the log of 111 equals 2+.0453 or 2.0453.

(b) 1150 is between 1,000 and 10,000, so, by Table 2, its log should be between 3 and 4.

Whole number - - - Log 1150=3.+
Decimal - - - - - Log 1150=.0607

Log 1150=3.0607

Table 3 gives the decimal part of the log of 115 as 0607.

(c) 1.2 is between 1 and 10; by Table 2 its log will be between 0 and 1.

Log 1.02=.0086 (verify).

It will be noted that the decimal part, or mantissa, of the log, does not change when the decimal point is moved, thus:

- Log 1130=3.0531.
- Log 113=2.0531.
- Log 11.3=1.0531.
- Log 1.13=.0531.

In each case we would look for the log of 113 in Table 3, the whole number part of the log is an index to the number of places to the left of the decimal point.

As previously stated, if numbers are to be MULTIPLIED their logs must be ADDED. As an illustration let us multiply the numbers in Problem 3.

Problem No. 4 — 111x1150x1.02=Log 111+Log 1150+Log 1.02:

Log 111	2.0453
Log 1150	3.0607
Log 1.020086

Adding, we find the log of the answer, or antilog. 5.1146

The whole number part of this antilog is 5, from Table 2 we find that the answer must be between 100,000 and 1,000,000 as the 5 determines the decimal place in the answer. Taking 1146, the decimal part of the antilog, we look in Table No. 3 and find that it lies between 1139 and 1173 in the columns headed 0 and 1, opposite 13. The difference between 1139 and 1173 is 34 and our antilog, 1146, is 7 greater than 1139; therefore 1146 is 7/34, or approximately .23 of the way between 1139 and 1173. The antilog of 1139 is 130 (opposite 13 and in column headed 0), adding the .2 and disregarding the decimal point, we get 1302 as the number whose antilog is 1146. The whole number, 5, in the antilog tells us that the answer will be between 100,000 and 1,000,000; so we must add ciphers until the decimal point is in the proper place; this gives 130,200 as the answer. (The number formed by the figures 1302, that lies between 100,000 and 1,000,000.)

Transferring logarithms back into numbers (finding antilogs) is perhaps the most difficult part of working with logarithms. However, if it is remembered that the whole-number part of the antilog determines the decimal point in the answer and that only the decimal part of the antilog is looked up in the log tables, little difficulty should be experienced in finding answers. Perhaps Problem 5 will illustrate this point more clearly.

Problem No. 5—Find the numbers corresponding to these logarithms: 1.1673, 2.1399, and 3.0294.

(a) Antilog of 1.1673—The whole number is 1; we find from Table No. 2 that the answer will lie between 10 and 100; therefore, there will be two places to the left of the decimal point in the answer.

Looking up 1673, the decimal part of the antilog, in Table No. 3, we find it to be the antilog of 147. As there should be two places to the left of the decimal, the answer will be 14.7.*

*(Re-printed from The Standard Handbook for Electrical Engineers, 1929 edition published by the McGraw-Hill Book Co., New York.)

(Continued on Next Page)

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(b) Antilog of 2.1399—The whole number is 2; there will be three places to the left of the decimal point in the answer (Table 2). Table No. 3 gives 138 as the antilog of 1399.

Answer: 138.

(c) Antilog of 3.0294—The whole number is 3; there will be four places to the left of the decimal in the answer. Table No. 3 gives 107 as the antilog of 0294.

Answer: 1070.

When the decimal part of an antilog falls between two consecutive numbers in a log table, it is necessary to interpolate in order to determine the last figure in the answer. Interpolation is accomplished by finding the difference between the figures given in the log table, subtracting the smaller log table number from the antilog, and forming a fraction with the difference of the log table numbers as the denominator and the difference between the smaller log table number and the antilog as the numerator. Example — Find the antilog of 2.0107.

In Table 3 we find that 0107 lies between 0086 and 0128, which are the decimal parts of the logs of numbers having the figures 102 and 103, respectively.

Larger number	0128
Smaller number	0086
Difference	42

Antilog	0107
Smaller number	0086
Difference	21

0107=21/42, or .5, of the way between 0086 and 0128.

Antilog of 2.0086=102.

Antilog of 2.0107=102.5 Answer.

Logarithms provide an easy method of raising a number to any power, or of extracting any of its roots. To raise a number to a certain power its log should be multiplied by the exponent, for example:

$$11^3=3x\text{Log } 11.$$

$$\text{Log } 11=1.0414.$$

$$3x\text{Log } 11=3.1242.$$

$$\text{Antilog } 3.1242=1331 \text{ Answer.}$$

RULE: To Raise a Number to a Certain Power, Multiply Its Log by the Exponent.

To determine any of the roots of a number its logarithm should be divided by the number indicating the root. Example:

Solve:

$$\sqrt[4]{14,641} = \frac{1}{4} x \text{Log } 14,641.$$

$$\text{Log } 14,641=4.1656.$$

$$\frac{1}{4} x \text{Log } 14,641=1.0414.$$

$$\text{Antilog } 1.0414=11 \text{ Answer.}$$

RULE: To Find a Certain Root of a Number, Divide Its Logarithm by the Index Number.

When great accuracy is not desired, a ten-inch slide rule provides an easy means for finding logarithms. Logs may be found on an old type Polyphase slide rule by setting the C scale on the slide so the number of which the log is desired comes opposite the RIGHT-HAND index on the D scale. If the rule is turned over the decimal part of the log may be read on the L scale. This number will be found directly beneath the scribed index mark on the celluloid window at the right-hand end of the rule. On the newer types of rules, which have the D and L scales on the same side, the hairline on the glass runner should be set to the NUMBER on the D scale and the decimal part of the log read directly from the L scale above.

For a more complete discussion of logarithms, including the treatment of collogs, the reader is referred to any standard text on mathematics, such as *Practical Mathematics for Home Study*, by Claude I. Palmer, McGraw-Hill Book Co.

(Part 2 of this article will be published in an early issue.)

RADIOS N. Y. C. FROM AIR OVER THE ANDES

Radio communication to the United States from an airplane flying over the Andes in South America between Chile and the Argentine was established when a message from the Pan American-Grace airplane San Cristobal was received at the New York offices of the Pan American Airways System.

The message which proves the effectiveness of the American-designed and built Panair radio equipment, was sent by Operator William Ehmer, a Scarsdale, New York, man who served Colonel Charles A. Lindbergh, Technical Adviser of the Pan American Airways, during Lindbergh's Caribbean tour last year, and is now conducting regular tests over the Andes for Pan American. He radioed:

“Passing Christ of Andes altitude 17,500, usual Panair communication.”

The Pan American-Grace planes fly the United States mails between Santiago and Buenos Aires and the present tests were to determine the effectiveness of the Panair sets under the difficult conditions prevailing over the Andes. The plane works the RCA stations at Santiago in Chile and Buenos Aires in the Argentine. The message was flashed from Buenos Aires directly to New York.—Panair News.

“I SAW YOUR AD. IN CQ.” Tell this to our advertisers—it helps all of us.

— no greater magazine published on development of short waves

Published Every Other Month



On All Newsstands

SHORT WAVE CRAFT, Mr. Hugo Gernsback's latest radio magazine, has been called his greatest achievement in radio magazine publishing. It is the one magazine devoted entirely to short waves that you have wished for so long. It is filled with real "live" dope—no theories, no mathematics—only practical and interesting material. Each issue contains articles by Lec de Forest, F. H. Schnell, Robert Kruse, "Bob" Hertzberg, David Grimes and many foreign authorities as well.

Regular Departments in Short Wave Craft

Photographic Section—pictures of latest short-wave sets and stations; Transmitters for short waves—How to build them; Short-Wave Receivers—Construction data for all types and kinds; The Short-Wave Experimenter; Television on Short Waves; Short Waves for the Broadcast Listener; Ultra Short Waves; Aircraft Short-Wave Sets; How To Build Short-Wave Aerials; Short-Wave Question Box.

Partial Contents of the Current Issue

Two or More Programs on a Single Short Wave, by Baron Manfred Von Ardenne. How To Neutralize Transmitting Amplifiers, by C. H. W. Nason. The Hot-Cathode Mercury-Arc Rectifier and How To Use It. The "Hams" Own Short Wave Receiver. How Hungary's Short-Wave "Police Net" Reduces Crime. Around the World with a 15-Watt Transmitter, by A. Binneweg, Jr. Latest Investigations in Ultra-Short Waves by Dr. Karl Stoye (Berlin). The Technical Story of 7-inch Wave Transmission Across the English Channel, (Int. Tel. & Tel. Co.). A "Suitcase" Portable Short-Wave Transmitter and Receiver.

Over 250 Illustrations, Hookups, Charts and Photographs, etc.—Actual Photographs of Short Wave Receivers and Transmitters.

Full Details in Coupon about Special Offer

SHORT WAVE CRAFT CQ-6
98 Park Place, New York, N. Y.

Enclosed find \$2.00, check or money order preferred, for which you are to send me **SHORT WAVE CRAFT** for One Year (Canada and foreign \$2.50). I understand that the regular subscription price is \$3.00, and this Special Offer is void after July 31st.

Name.....
Address.....
City and State.....

"I SAW YOUR AD. IN CQ." Tell this to our advertisers—it helps all of us.

PERSONAL ITEMS

(Continued from page 8)

Otis Hill and R. L. Simpson, two old-time commercial men, are permanently located at Hilo, Hawaii. They own and operate the amateur stations K6AJA and K6FCX, working on 40 meters.

* * *

A former East Coast operator now sailing on the Pacific would like to know: Is KOBX still the big noise in the West Indies? Does GCK still use a spark transmitter? Is the op on KEFB still running things as they should be run on the Atlantic?

* * *

An inquiry has been received for Operator Howard, once on the SS. "Endicott," sailing out of Galveston.

* * *

Frank N. Davidson, chief of the "Tahiti" when she foundered in mid-Pacific, has been awarded the 1930 V.W.O.A. Gold Medal for Distinguished Service.

* * *

A former U. S. Lines operator, Conway Sheerin, is now with the Airways Service at Wichita, Kansas.

* * *

The manager of KOIN, Portland, Oregon, refuses to employ experienced operators; he gets graduates from the local "mill" at \$55 to \$60 per MONTH. They just take the jobs for the experience, donchano.

* * *

Who knows what Jack Binns is doing now?

* * *

Three separate agencies are now attempting to organize unions and associations of radio operators. CQ will be glad to assist in co-ordinating their efforts. The establishment of ONE airtight organization for ALL licensed men is what we are working for. We do not care who the sponsors are so long as they give operators a square deal.

* * *

We commercial ops owe a vote of thanks to Dr. De Forest for the splendid support he is giving our campaign to raise the standards of radio operating.

* * *

Here's a good one from the V.W.O.A. monthly Bulletin: "NPH, on the West Coast, had just sent a radiogram to a Jap ship. A long pause, the Jap finally came back, 'Please Mister, send slow very, I am a Virgin Operator.' Laff that off!!"

* * *

Don't forget we still need employment reports, skeds, operating notes, station descriptions, and other information of interest to operators. How about putting a little more BY in this OF, BY, and FOR slogan of ours?

Press, Time and Weather Schedules for the Trans-Atlantic Run*

SCHEDULE No. 1—EASTERN STANDARD TIME

TIME	WAVE	CALL	LOCATION	SERVICE	
00: Midnite	18060	CW	DFY	Nauen, Germany	Time Signals
2:00 A.M.	2653	ACW	NAA	Washington, D. C.	Ship TFC
3:00 A.M.	37.4	ICW	NAA	Washington, D. C.	Time Signals
3:00 A.M.	2653	ACW	NAA	Washington, D. C.	Time Signals, WX
3:00 A.M.	16840	CW	NSS	Washington, D. C.	Time Signals
4:20 A.M.	600	SPK	VCE	Cape Race, NF.	WX, Ice, Dangers to Nav.
4:20 A.M.	13750	CW	WII	New Brunswick, N. J.	Press
4:30 A.M.	3333	CW	WNU	New Orleans, La.	WX, Ship TFC, Press
6:00 A.M.	36.3	ICW	WHD	New York City	Press
7:00 A.M.	37.3	ICW	NAA	Washington, D. C.	Press
7:00 A.M.	2653	ACW	NAA	Washington, D. C.	Press
7:00 A.M.	16840	CW	NSS	Washington, D. C.	Press
8:00 A.M.	37.3	ICW	NAA	Washington, D. C.	Time Signals
8:00 A.M.	2653	ACW	NAA	Washington, D. C.	Time Signals
8:00 A.M.	16840	CW	NSS	Washington, D. C.	Time Signals
8:00 A.M.	32.5	CW	FLJ	Issy-Les-Moulineaux	Time Signals
8:00 A.M.	18900	CW	FLY	Bordeaux, France	Time Signals
9:10 A.M.	18740	CW	GBR	Rugby, England	WX for Shipping
9:30 A.M.	2650	ICW	FLE	Eiffel Tower, Paris	Time Signals
9:48 A.M.	600	SPK	GCK	Valencia, Ireland	WX Ships, Atlantic, Gulf
10:00 A.M.	6518	CW	NBA	Balboa, C. Z.	WX for Shipping
10:15 A.M.	750	ICW	DAN	Norddeich, Germany	WX, Press
11:30 A.M.	1000	SPK	CTV	Monsanto, Portugal	North Sea WX (German)
12:00 Noon	18060	CW	DFY	Nauen, Germany	WX for Coast, Biscay, Azores
12:00 Noon	2290	CW	DAN	Norddeich, Germany	Time Signals
12:30 P.M.	2800	SPK	FUA	Nantes, France	North Atlantic WX (German)
3:00 P.M.	2653	ACW	NAA	Washington, D. C.	North Atlantic WX (French)
4:20 P.M.	600	SPK	VCE	Cape Race, NF.	WX, Ice, Dangers to Nav.
4:30 P.M.	3333	CW	WNU	New Orleans, La.	WX, Ship TFC, Press
5:00 P.M.	2653	ACW	NAA	Washington, D. C.	Time Signals, Ship TFC
8:00 P.M.	32.5	CW	FLJ	Issy-Les-Moulineaux	Time Signals
8:00 P.M.	18900	CW	FLY	Bordeaux, France	Time Signals
8:48 P.M.	600	SPK	GCK	Valencia, Ireland	WX for Shipping
9:18 P.M.	18740	CW	GBR	Rugby, England	WX for Shipping
9:30 P.M.	750	ICW	DAN	Norddeich, Germany	North Sea WX (German)
10:30 P.M.	2650	ICW	FLE	Eiffel Tower, Paris	Time Signals
11:00 P.M.	1000	ICW	CTV	Monsanto, Portugal	WX for Coast, Biscay, Azores

Ice Patrol Vessel (NIDK) broadcasts ice warnings during months of March, April, May, June, and later if necessary, as follows:

- 6 A.M. and 6 P.M. EST (11 A.M. and 11 P.M. GCT)—on 706 meters.
- 7 A.M. and 7 P.M. EST (12 Noon and 12 Midnite GCT)—on 1713 meters.

SCHEDULE No. 2—GREENWICH CIVIL TIME

TIME	WAVE	CALL	LOCATION	SERVICE	
1:00 A.M.	36.3	ICW	WHD	New York City	Press
2:00 A.M.	37.3	ACW	NAA	Washington, D. C.	Press
2:00 A.M.	2653	ACW	NAA	Washington, D. C.	Press
2:00 A.M.	16840	CW	NSS	Washington, D. C.	Press
3:00 A.M.	37.3	ICW	NAA	Washington, D. C.	Time Signals
3:00 A.M.	2653	ACW	NAA	Washington, D. C.	Time Signals
3:00 A.M.	16840	CW	NSS	Washington, D. C.	Time Signals
3:00 A.M.	32.5	CW	FLJ	Issy-Les-Moulineaux	Time Signals
3:00 A.M.	18900	CW	FLY	Bordeaux, France	Time Signals
4:30 A.M.	2650	ICW	FLE	Eiffel Tower, Paris	Time Signals
5:00 A.M.	6518	CW	NBA	Balboa, C. Z.	WX, Press
6:30 A.M.	1000	SPK	CTV	Monsanto, Portugal	WX for Coast, Biscay, Azores
7:00 A.M.	18060	CW	DFY	Nauen, Germany	Time Signals
10:00 A.M.	2653	ACW	NAA	Washington, D. C.	WX Ships, Atlantic, Gulf
11:20 A.M.	600	SPK	VCE	Cape Race, NF.	WX, Ice, Dangers to Nav.
11:30 A.M.	3333	CW	WNU	New Orleans, La.	WX, Ship TFC, Press
12:00 Noon	2653	ACW	NAA	Washington, D. C.	Time Signals, Ship TFC
12:00 Noon	2828	CW	NAR	Key West, Fla.	Time Signals
1:00 P.M.	2653	CW	NAR	Key West, Fla.	WX, TFC List
3:00 P.M.	32.5	CW	FLJ	Issy-Les-Moulineaux	Time Signals
3:00 P.M.	18900	CW	FLY	Bordeaux, France	Time Signals
5:30 P.M.	2650	ICW	FLE	Eiffel Tower, Paris	Time Signals
6:00 A.M.	1000	ICW	CTV	Monsanto, Portugal	WX for Coast, Biscay, Azores
7:00 P.M.	18060	CW	DFY	Nauen, Germany	Time Signals
9:00 P.M.	2653	ACW	NAA	Washington, D. C.	Ship TFC
10:00 P.M.	37.3	ICW	NAA	Washington, D. C.	Time Signals
10:00 P.M.	2653	ACW	NAA	Washington, D. C.	Time Signals, WX
10:00 P.M.	16840	CW	NSS	Washington, D. C.	Time Signals
11:20 P.M.	600	SPK	VCE	Cape Race, NF.	WX, Ice, Dangers to Nav.
11:20 P.M.	13750	CW	WII	New Brunswick, N. J.	Press
11:30 P.M.	3333	CW	WNU	New Orleans, La.	WX, Ship TFC, Press

*(An explanation of these schedules will be found on page 18.)

"I SAW YOUR AD. IN CQ." Tell this to our advertisers—it helps all of us.

THOSE PINK TICKETS

Possession of an Extra First Class Commercial Radio Operator's License is prima facie evidence that its owner is a reasonably good radio operator. To be eligible to take an examination for a pink ticket an applicant must have had at least two and one-half years' experience in stations open to public correspondence. Of this time, eighteen months must have been served (on a first class license) during the two years previous to the filing of an application to take the examination.

The code test consists of sending and receiving Continental Morse at a speed of thirty words a minute in code groups. A hand key must be used in the sending test and a pencil for copying. In addition, there is an examination in the transmission and reception of American Morse at the rate of twenty-five words per minute in plain language, five characters to the word.

The theory examination consists of three diagrams and a like number of question sheets, the equivalent of three complete first class examinations. Exclusive of diagrams, there are 120 questions, some subdivided, which usually require from a week to ten days to answer. Eighty per cent constitutes a passing mark, a high grade is difficult to secure as local RI's grade the papers very carefully, because they must be sent to Washington and checked by inspectors there before a license will be issued. There have been only forty-seven Extra First Class Licenses issued since April, 1929—some of these were renewals.

EMPLOYMENT REPORTS

(Continued from page 11)

mately fifty experienced operators awaiting assignments, with about one job opening every two weeks. The Standard Fruit Company pays its chief operators ninety dollars a month and its second, sixty, the ships owned by this concern fly the Honduran flag. Conditions in this section are practically the same as reported elsewhere, no jobs, lots of new and unexperienced operators, low wages, plenty of old-timers on the beach, and schools running full blast.

* * *

Note.—Marine and Broadcast Operators—You can help your fellow radio operators by sending monthly employment reports to CQ. We need reliable and accurate information regarding the conditions existing in every important city. Reports should be mailed in time to reach Southern California by the fifteenth of each month. Keep us posted on the situation in your city so we can help those who are looking for work.

"I SAW YOUR AD. IN CQ." Tell this to our advertisers—it helps all of us.

KUP TO INCREASE POWER

The Federal Radio Commission recently issued a construction permit for two 2-kilowatt, crystal controlled transmitters to KUP, the Hearst goodwill press station in San Francisco. The new equipment, which will be installed and ready for operation by the middle of July, will permit KUP to operate simultaneously on 18 and 26 meters in the daytime and 36 and 46 meters at nights. The transmitters will be of the latest design and will be constructed in San Francisco under the supervision of Ronald G. Martin, manager of KUP.

EXPLANATION OF SCHEDULES ON PAGE 17

These excellent schedules and the following comments were submitted by an operator on a Lykes Ripley freighter: "Here are two schedules which I have found to be very useful in the European run from Gulf ports. Ordinarily, I keep Eastern Standard Time until about half-way across the Atlantic, changing then to Greenwich Civil Time by advancing my clock five hours. For this reason I have two separate schedules posted on the bulkhead, enabling me to tell at a glance what schedule I wish to cover without having to do any mental arithmetic because of a difference in time. The portions of the schedules which are likely to be used all, or nearly all, the way across are included in both and those which are useful only on one side of the ocean are omitted from the schedule for the other half of the voyage."

Let's have some dope like this, you fellows on the South American, South African and Mediterranean runs.

NOTICE

In order that the work of editing and copy-reading may be made as easy as possible, it is requested that our contributors typewrite and double space all material submitted for publication in CQ. Thank you.

SEAGOING OPS

If you are a good salesman you can make a neat little side stake each month by acting as advertising solicitor for CQ in your various ports of call. Leads furnished and liberal commissions paid promptly. If interested, write for further information.

Atlantic Coast and Great

Lakes Men — Please Note

CQ needs correspondents and advertising solicitors on the Atlantic Coast and the Lakes. If we are to serve you effectively we must be kept informed of the latest developments in your districts. We need employment reports, personal items, station data, technical articles, press, weather and time schedules, good stories, jokes, cartoons and any other material of interest to radio men. Let's hear from you.

IMPORTANT NOTICE

All professional radio men interested in raising the standards of their trade are urged to join the EIGHT-HOUR DAY CLUB, sponsored by CQ. This club was founded in order to secure funds with which to carry on a campaign for improved conditions. Membership costs only 25 cents. JOIN NOW! Send your membership fee, and any extra amount you may care to contribute to the cause, to the Editor, CQ. Let's all get together and secure an eight-hour day and the other rights that should be ours.

* * *

EDITOR, CQ:

I wish to enroll in the EIGHT-HOUR DAY CLUB, enclosed is my membership fee.

Name

Address (permanent).....

Station.....

THE ROCK CRUSHER

(Continued from page 9)

Dependability is one thing that is necessary for this position together with good judgment. We have many good men in the profession who certainly could qualify; however, we will have to admit that there are a good many young men in the profession who are really too young to exercise sound judgment that this office requires. These men could start in on the smaller ships as "watchers" on a third or fourth class license and as their experience qualifies, they can be promoted and become eligible for higher licenses.

* * *

Ho-Hum:

See where my friend Mr. Farmer took several "pot-shots at the balloon operated by the Air Transport Companies. Hope he did not get tangled up in the wreckage. My friend Farmer has sailed on many ships on many oceans and knows his "onions."

* * *

Did you ever notice the method used by some of the Big Companies in promoting their personnel? Well, when a man has been in a certain position so long, such as Marine Manager we will say, he is promoted to Marine Supt. The next step is Thirty-second Vice-President in charge of Marine Operators, etc., etc., all at the same rate of pay—that works on the ego. Tsk, tsk me boy, tsk, tsk.

* * *

Note my old friend Howard S. Pyle, Lieut. (J.G.) in the U.S.N.R., former editor

~ “CQ” ~
CLASSIFIED ADVERTISING

CQ will accept classified advertising from licensed radio operators and persons employed in allied services at the special rate of five cents per line.

- (1) Advertising shall pertain to radio and shall be of interest to professional radio operators.
- (2) No display of any character will be accepted, nor can any special typographical arrangement such as all or part capital letters be used which would tend to make one advertisement stand out from the others.
- (3) The rate for advertising of a commercial nature is three cents per word.
- (4) Remittance in full must accompany copy, closing date for classified advertisements is the first of the month preceding publication date. Provisions of paragraphs (1) and (2) apply to all advertising in this column, regardless of which rate may apply.

BAKELITE PANEL ENGRAVING—Radio and technical; finest workmanship. Established five years. Request price lists. A. L. Woody, Engravers, 19 South Wells Street, Chicago, Ill.

WANTED—Copies of the first issue of CQ. We will pay fifteen cents each for copies of the March number. Our supply is completely exhausted and we are unable to fill the many requests received from operators who desire to complete their files. MRR Care of CQ.

FREE LOG BOOKS—An up-to-date amateur station log will be given to every commercial radio operator having an amateur station. No cost or obligation. Write for yours today. Radio Manufacturers Supply, 1000 South Broadway, Los Angeles, Calif.

OPERATORS—If you have a bug, mill or relay to sell; if you want to obtain parts for an amateur station, advertise in the Classified Section of CQ. Special rates to commercial operators.

FOR SALE—Old style Omnigraph with five dials. First reasonable offer takes it. JMD, care CQ.

CQ CIRCUIT DIAGRAMS—A complete set of five diagrams acceptable for first and second class commercial license examinations. If you are studying for a commercial license examination you cannot afford to be without these diagrams. Each diagram is complete, every part numbered and described. The complete set costs only 75 cents. Order yours today from CQ. Wedel & Co., 520 Second Ave., Seattle, or Radio Manufacturers' Supply, 1000 South Broadway, Los Angeles.

of a radio publication for operators and a real oldtimer in the radio game is "bally-hooing" for the Naval Communication Reserve. This service is a mighty good thing and deserves the further consideration of every radio man.

* * *

Due to extenuating circumstances, I shall bring this column to a tearful close and come back to haunt you in the next issue.

"I SAW YOUR AD. IN CQ." Tell this to our advertisers—it helps all of us.

EMPLOYMENT REPORTS*(Continued from page 11)***Pacific Coast—**

to \$200 per month? If so, it will be to our advantage to get QSO with us right now. If not, come in anyway. Bring this card with you. CUL es 73s."

W6YO Western College of Radio—735 Larkin Street—San Francisco.

* * *

Great Lakes—

This report, dated May 17, sums up the situation on the Lakes: "There have been few if any changes in the outlook since the last report. A number of additional boats have been fitted-out and put into service—not many. There is a large, and growing

waiting list of experienced men waiting assignment, not a few standing-by to return to their old berths. While there will probably be more activity within the next few weeks, there will not be enough to warrant any degree of optimism, according to the opinion of men who are in a position to know exactly what the prospects are. The amount of ore moved up to the present writing is negligible compared to normal years; ore cargoes are an important, vital factor in Great Lakes shipping. With the resumption of the passenger boats, which get under way about the middle of June, some positions will be available, of course, aside from the freighters; but an outsider's chance to land one of these jobs is rather slim this year: That long, long waiting list. . . .

**Through the Courtesy of a Number of Leading Radio Stores,
CQ Has Been Placed on Sale in the Following Cities:**

SEATTLE—Wedel & Co.,

520 Second Avenue.

SEATTLE—Oxo Radio Mfg. Co.

1022 Third Avenue.

SAN FRANCISCO—Warner Bros. Radio Co.,

428 Market Street.

LOS ANGELES—Radio Manufacturers' Supply,

1000 South Broadway.

NEW YORK—Blan, the Radio Man,

89 Cortlandt Street

Purchase your radio equipment from these concerns and mention CQ—it helps all of us.

PYREX INSULATORS
MICA TRANSMITTING
CONDENSERS

EDGEWISE WOUND
INDUCTANCES

MAin 5077

OXO Radio Manufacturing Company

**WIRELESS TELEGRAPH AND TELEPHONE EQUIPMENT
BROADCASTING STATION EQUIPMENT**

*At your service at any time for:
Repairing and Re-building
Building of Sets to Order
Marine Equipment
Transmitters and Receivers for All Frequencies
C. W. and Phone Equipment*

1022 THIRD AVENUE - - - SEATTLE, WASHINGTON

"I SAW YOUR AD. IN CQ." Tell this to our advertisers—it helps all of us.

Attention . . .

**Broadcasting Stations, Wireless Operators,
Power Stations, Service Stations,
Engineers, Contractors
EVERYWHERE!**

Buy in Seattle and Portland

At the World's Lowest Wholesale Prices

We carry in stock for Transmitting and Receiving, one of the most complete assortments of

**RADIO PARTS, TUBES AND ACCESSORIES
IN THE UNITED STATES**

(We actually carry the merchandise in stock.)

**EVERY NATIONALLY KNOWN PRODUCT OF MERIT
For Building Transmitting and Receiving Radio Sets, Amplification
and Public Address Systems, Etc.**

REPLACEMENT PARTS A SPECIALTY

Kits, Tubes, Midget and Console Radio Sets and Cabinets
Bids Solicited (large or small) for Electrical Appliances and Wiring Material
Technical Advice FREE

Standard Merchandise Only—No Job Lots—No Distressed Imitation Parts

Our Mail Order Department gives you absolutely prompt service in case our traveling salesmen do not reach you.



Wedel Company, Inc.

Established 1888

RADIO AND ELECTRICAL WHOLESALE JOBBERS

Main Office and Salesroom, 520 Second Ave., SEATTLE, WASH.—Main 3195
Portland Branch, 443 Washington Street, PORTLAND, ORE.—Beacon 7783

Cable Address, "WEDELCO"—W. U. Code

"I SAW YOUR AD. IN CQ." Tell this to our advertisers—it helps all of us.



Are YOU A FIRST CLASS RADIO OPERATOR?

Can YOU make a PERFECT copy of WNU press with a pencil or mill?

Can YOU cut a mimeograph stencil directly from WNU, WHD or KUP press without having to recopy?

Can YOU copy press 3 to 5 words behind without breaking? Can YOU count checks in your head and give the station you are working your "OK" the instant he has finished transmitting? Can YOU send PERFECT code groups at a speed of 30 wpm with a bug or hand key?

If YOU are really a FIRST-CLASS radio operator you should be able to answer "YES" to ALL these questions. If you cannot answer them in the affirmative you should investigate

§§§

The Candler System Course IN High-Speed Telegraphing

Guaranteed To Increase YOUR Speed in
Sending and Receiving

The Candler System is a Post Course of intensive training for the development of SPEED and ACCURACY in code work through Scientific Methods. It trains the Brain, Muscles and Nerves to CO-ORDINATE —helps to give you confidence and relieve nervous strain. Our methods are based on fundamental scientific principles of proven worth.



TELEPLEX and 10 Scientifically Prepared Tapes that go with our Courses, furnished at Wholesale to our Students. If you have an automatic machine you can use our tapes.

If YOU want to become a REAL operator it will pay you to write to us, outlining your difficulties and ambitions. We will answer any questions without cost or obligating you in any way, and give you the benefit of our experience helping over 45,000 Radio and Morse operators during the past 20 years. Write or, mail coupon TODAY.

THE CANDLER SYSTEM CO.,
8343 So. Kedzie Ave., Chicago, Illinois

CQ-4

Without obligating me in any way, send information on the course or courses I have checked:

CANDLER SYSTEM (Senior Course) in High-Speed Telegraphing

RADIO-TOUCH TYPEWRITING COURSE

My present speed is: Sending _____ wpm. Receiving _____

I want to qualify in both American Morse and Continental.

I am giving in a letter further information about myself, my ambitions, etc., to enable you to give me your personal advice.

Name _____ Age _____

Street _____

City _____ State _____

(PRINT)

Do It NOW!

Don't delay another day. Write or clip the coupon before you turn this page. Take the first step to become a first class radio operator now.