

Automatic Teacher of the Wireless and Morse Code



It will teach you how to receive the Wireless or Morse code accurately, rapidly and in a remarkably short time. All you need to do is put the phones over your head and listen to the dots and dashes. It is as easy to operate a Natrometer and become an expert as it is to listen in on a telephone. It is particularly adapted to the needs of those who know nothing about receiving, as it will send from a beginner's to an expert's speed. You can quickly learn to receive twenty, twenty-five and thirty words a minute.

National Radio Institute 1345 Pennsylvania Ave., N. W. Washington, D. C.

An Automatic Teacher of Wireless Telegraphy and Morse Telegraphy

Distinctly recites the Wireless Code or the Morse Code over and over again, at any speed you want it to, until you know it and can not possibly forget it.

The Natrometer is a finely adjusted instrument, so simple to operate that a child can use it with perfect results. It comes into your home as a patient, tireless, instructor in sending and receiving, giving distinct and impressive signals representing the dots and dashes of the Wireless Code or the Morse Code. It is not necessary to have electric wires in your home or office to operate it—just connect a single dry cell to it, start the motor, put the phones over your head and listen to the code being sent to you more perfectly and more smoothly and evenly than the human hand can possibly do.

IT IS ENDORSED BY PROMINENT MEN AS AN EXCELLENT AUTOMATIC TRANSMITTER.

The Natrometer is being endorsed continually by its users and particularly by prominent men who claim it superior to any known instrument of this kind for teaching receiving Wireless and Morse Code. Mr. Henry H. Lyon, joint-inventor of the Roger-Lyon system of under-water and under-ground radio signalling, endorses the Natrometer above any and all instruments, claiming that no machine on the market today will do the work the Natrometer will do.

THE NATROMETER SENDS SMOOTHLY, EVENLY AND WITH-OUT THE SLIGHTEST RESEMBLANCE OF CHOPPYNESS.

There is not the slightest resemblance of choppyness about the automatic sending of the Natrometer. It sends smoothly, evenly, day after day. Notice the photograph on page 4. Every feature of the Natrometer is pointed out. Over six hundred combination messages can be had from one drum by inserting code changing pins in the holes in the drum. It is complete to the minutest detail. Durably constructed, handy to operate, this machine has no superiors. It will send in a clear distinct tone. There is no wear about the machine—no rattling or clicking noises to interfere with the operator. The dots, dashes and spaces are reproduced from the sending of three of the most expert Trans-Atlantic operators.

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What The Natrometer Will Do

The Natrometer will enable the beginner who knows nothing about sending and receiving to quickly become a proficient operator. It will send just as slow as any beginner would want it to—three words a minute—and which speed can be increased gradually at the student's will until he is a master of sending and receiving. No experience with receiving from hand sending is necessary in order to become an expert operator—the Natrometer is all he needs.

The Natrometer will enable the Amateur Radio Operator to quickly bring his receiving speed up to that required in order to obtain a Government Amateur or Commercial License. It will start him right in where he is best qualified to begin in speed practice. The speed is easy to regulate.

The Natrometer will enable **the Morse Operator** to become a proficient wireless operator. In this respect the Natrometer has been particularly praised. The Morse Operator who has already acquired the knack of sending and receiving the Morse Code, will find practicing with the Natrometer a very quick way to master the wireless code and become an expert.

The Natrometer is particularly helpful to those who are trying for a Government Operator's License. The drum contains messages, code material, numerals, punctuation marks—in fact, all kinds of code practice which can be expected when taking the examination for this license.

The Natrometer will enable the Amateur, or the would-be Amateur, to quickly bring up his receiving speed so he can "listen in" on messages being sent at all speeds from various transmitting stations within his wave length.

SUPERIOR FEATURES OF THE NATROMETER

The Natrometer will send from 3 to 40 words per minute, which enables the beginner as well as the advanced operator to get the practice he wants.

The Natrometer is the only machine with which the alphabet is taught in a systematic and scientific manner at a speed which a beginner can copy. The drums progress or advance in code instruction step by step just as the theory of wireless is taught beginning first at the ground floor.

The effect of static interference may be added to the message being copied. A new feature not possessed by any other instrument.

The Natrometer is perfectly noiseless when running. It can be wound while running and sends smoothly. There is not the slightest resemblance of choppyness in the messages coming through the phones.

The Natrometer occupies only about one-half the space of any other instrument of its kind on the market today.

The Natrometer has less than one-half the number of parts possessed by other machines. Its simplicity and durability of construction has won praise from mechanical experts.

The Natrometer is easy to operate. A child can operate it without any trouble. Complete instructions go with every machine sent out.

The shifting device makes it possible to get more than 600 combinations from one drum. It is therefore practically impossible to memorize the code instruction contained on one drum.



Natrometer Model "B"

(Photograph of machine is shown on Page 4.)

This model Natrometer is mounted on a one-half inch wooden base, the dimensions of which are $8\frac{34}{2}$ x $6\frac{1}{2}$. The machine is $5\frac{1}{2}$ high.

This model is equipped with a Phone, leather-covered headband with high frequency Buzzer and Loud Speaking Coil. It also includes one drum, permitting 600 different combinations by the use of the unique method of shifting from one row on the drum to the next row below.

Notice the details of the machine as pointed out on the opposite page. The Winding Handle is convenient, but not in the way. The Pins for changing the code are right before you. You can easily insert them in the Code Drum while the machine is in operation. The Speed Control Knob is just where you want it—easy to adjust. One turn of this knob and the Natrometer will respond instantly, either increasing or decreasing the speed as you may want it to.

The machine as shown on the opposite page is exactly the way it will appear before you when it is unpacked after delivery—ready to operate.

It is operated without the use of ærials, by simply using one dry cell. The machine is fully wired ready to operate when delivered. Complete directions for operating it are sent with every machine.

Price of complete model, including phone, high frequency buzzer, loud speaking coil and one drum_____\$25.00 Price of additional wireless code drums for this model____\$2.50 each.

Note-When ordering, be sure to give your nearest American Railway Express Office.

Shipped by express, charges collect, weight about 12 fbs., upon receipt of the full price in advance with order, or \$10, the balance (\$15) to be collected on delivery.

After a good deal of experience I have finally come to the conclusion that there is only one sure method of passing the code test for a commercial license, and that is by the use of such an instrument as your Natrometer... B. H. Bangart, Box 385, Valparaiso, Ind.



Natrometer Model "A"

This Model Natrometer is the same as Model "B" having the same kind of motor and material in its construction, but it is put up in a handy carrying case with transmitting key.

This permits convenient transportation. The machine only weighs about 10 lbs. when in the carrying case. All you need to do is lift the top off the machine and the Natrometer is there ready to serve you better than an expert instructor.

This, like all other Natrometer Models, is operated without the use of ærials, by simply using one dry cell. The machine is fully wired ready to operate when delivered. Complete directions for operating it are sent with every machine.

Price of Complete Model, including the Carrying Case_____\$30.00 Price of additional Wireless Code Drums for this Model____\$2.50 each

Shipped by express, charges collect, weight about 10 lbs., upon receipt of the full price in advance with order, or \$15, the balance of \$15 to be collected on delivery.

Note-When ordering, be sure to give your nearest American Railway Express Office.

The Natrometer has proved to be all and more than you claim it to be. Starting at 5 words a minute, I gradually increased the speed until 31 words could be taken. The best part of the Natrometer to my mind is that it makes no mistakes and is a tireless sender at any speed desired for any length of time. I believe that no other automatic sender on the market today equals or comes anywhere being its equal. I recommend it to anyone who is thinking of buying such an instrument.—Charles Champ, 20 Market Street, Amsterdam, N. Y.

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Natrometer Model "C"

This model Natrometer is mounted on a one-half inch wooden base, the dimensions of which are $8\frac{34}{2}$. The machine is $5\frac{12}{2}$ high.

This model is constructed the same as Model "A," having the same motor and material in its makeup, but being equipped with a high frequency Buzzer only. It is also equipped with a drum.

It is operated without the use of ærials, by simply using one dry cell. The machine is fully wired ready to operate when delivered. Complete directions for operating it are sent with every machine.

Price of complete Model, including Century Buzzer and drum___\$20.00 Price of additional Wireless Code Drums for this Model____\$2.50 each

Shipped by express, charges collect, weight about 10 lbs., upon receipt of the full price in advance with order, or \$10, the balance \$10 to be collected on delivery.

Note-When ordering, be sure to give your nearest American Railway Express Office.

I think the Natrometer is a most wonderful device. It is noiseless, less choppy and to me more accurate than any practice instrument on the market.—E. Roe, 255 Ft. Washington Street, New York City.

Either of the foregoing models may be supplied with a Universal electric motor drive. Information regarding extra cost may be had upon request.

How To Operate The Natrometer

As complete directions for operating the different Models given in this booklet accompany every machine shipped from this office, the matter of operating the Natrometer is dealt with here only in a general way.

To operate the Natrometer, any model, connect a dry cell to the place marked on the picture furnished with the machine, wind up the motor by means of the winding handle, adjust the speed to your liking by means of the speed control knob the Natrometer will send to you just as fast, as clear and as distinctly as you will want it to. It is possible to run the Natrometer as slow as three words a minute.

The shifting method can be explained by saying that by placing one code changing pin in the drum, one shift will be made for every complete revolution; by placing two pins in the drum, two shifts will be made every revolution, etc. The loudness of the signals may be changed by moving the round iron core within the loud signal coil.

Additional drums for the Natrometer, any model, can be bought in any quantity up to ten. The same drum fits all models.

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What The Users Of The Natrometer Say About It

I think the Natrometer is the best way to learn the code and gain speed.—D. Dalbontin, 103 Wolfe Street, San Francisco, Cal.

The Natrometer is simple to operate and always on the job.-Henry Peterson, P. O. Box 23, Pomfret Center, Conn.

The Natrometer is the most efficient teacher of the code I have ever used-F. C. Sochaski, 4 Prospect Place, Middletown, Conn.

The Natrometer can't be beat. It is the best way to learn to receive. I believe the Natrometer is the best and quickest way to master the code.—Edward S. Kuwabara, Honolulu, T. H.

The beauty of the Natrometer is that it has a lot of combinations of messages and you can't learn the messages by heart as a fellow down here can on other practice sets.—John C. Pavo, 463 N. Underwood St., Fall River, Mass.

Your method of teaching the art of sending and receiving with the Natrometer is far ahead of the method of any other school.—Harold Chesebrough, Preble, New York.

As a code transmitter, the Natrometer is surely an accurate and snappy instrument.—Frank M. Hanna, 1211 Hutton Street, Troy, N. Y.

The Natrometer—it is the finest machine I have ever seen. The action is smooth, the speed easily adjusted, and the whole machine looks "business-like".—Elry Martin, P. O. Box 333, Menard, Texas.

Received the Natrometer and am perfectly satisfied with it. It is a fine instrument for the work designed for it. You can understand it plainly, and it also has good spacing.—Paul S. Gerhart, 562 Ridge Street, Emans, Pa.

Answers To Questions You May Want To Ask

Will the Natrometer teach me the code well enough to become a professional operator?

Yes, the Natrometer will teach you to receive rapidly and accurately in a very short time. It takes the place of the instructor in many resident radio schools its sending is so perfect.

Does the Natrometer need frequent adjusting or repairing?

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No, the Natrometer will run day after day for years without being touched. It is so simply and durably constructed that there are very few parts subject to wear to any extent except after long and severe usage.

Will I need electrical power to operate the Natrometer, and will it receive messages from a distance or transmit over a distance?

No, you will not need electrical power. One dry cell connected according to directions furnished furnishes all the electricity necessary. The Natrometer is strictly an automatic transmitter, the messages it sends being cut in the dials. It will not receive from a distance, or transmit a message over any distance.

Is the Natrometer of any use to an Amateur Wireless Operator who has a receiving set?

The Natrometer is of particular value to the amateur. Until he has acquired a receiving speed of 10 to 20 words a minute the messages flashing through the air will come too fast for him to pick up on a receiving set. The Natrometer is just the instrument an amateur needs in order, not only to learn to enjoy the fascination of operating his receiving set, but to become a commercial operator.

In what way will a Natrometer help a Morse Telegraph Operator?

The Natrometer will enable the Morse operator to build upon his present knowledge and knack of sending and receiving and become a master of the wireless code as well. The Morse operator needs little training outside of what he can obtain by using a Natrometer in order to become a qualified first-class radio operator.

Can I have the Natrometer shipped by Parcel Post?

Yes, we will ship the Natrometer by parcel post to anyone residing in the United States, provided sufficient postage is sent with your order to prepay postage. We cannot send the Natrometer by parcel post to purchasers outside of the United States.

Just Out! U. S. GOVERNMENT LICENSE EXAMINATION **QUESTIONS ANSWERED!**

Examinations

and



This Book, "New License Quiz Book for Government First-Class License Examinations," is the first edition printed with the new rules, regulations and gradings laid down by the Government on July 1, 1921. Every amateur expecting to take examination for license needs this book. It gives the answers to 250 questions, many of which will be helpful in the examination. It gives practical equations, international laws and regulations, official gradings, diagrams, definitions and other important information-invaluable to the candidate for government examinations.

FIRST-HAND INFORMATION ON REQUIREMENTS TO BECOME A COMMERCIAL OPERATOR

All latest requirements are thoroughly covered. Complete information on Electrical Symbols, How to Become a Successful Operator, Definition of Radio Terms; all types of Transmitters-Damped Wave (Spark), Undamped Wave (Arc), Undamped Wave (Tube); Receivers-Damped Wave (Spark), Undamped Wave (C. W.). 250 QUESTIONS AND ANSWERS preparing for Government License. Don't run a chance of not knowing all the requirements for a license. radio laws, etc. Mail your order to us today. Price \$1.

NATIONAL RADIO INSTITUTE, Washington, D. C.

High Grade Phones, Buzzers And Practice Sets For The Radio Man

Although we do not manufacture any of the apparatus shown on this page we carry a supply in stock and can fill any orders which prospective purchasers of our Natrometer may send us.

Learner's Head Set



Scientifically constructed for radio use. This is the head set with which the Natrometer is equipped. They are just the thing for those

who wish a low-priced sensitive head set. Three-foot cord included. Resistance 80 ohms.

Price _____\$2.25

Murdock Phones



These sets have given wonderful service to thousands of users. Murdock phones are famous for their fine quality permanent steel magnets, responsive diaphragms and long-wearing qualities.

Five-foot cord included with every set.

Price, double set 2000 ohms__\$4.50 Price, double set 3000 ohms__ 5.50

Wireless Practice Set



This Practice Set is made up of a regular telegraph key mounted on a base together with a high pitch buzzer. It is sent wired up ready for use immediately upon delivery. This set will enable the beginner to master the wireless code, numerals and punctuation marks so that he can take up receiving. All that is necessary is to connect a dry cell to the binding posts and begin sending.

Practice Set complete with flexible cord_____\$2.50

Wireless Buzzer

These buzzers are adjusted to emit a clear, high-pitched, sound corresponding to a wireless message as heard in the phones of a receiving set. Well constructed. The tone can be regulated to the desired pitch by adjusting the contact lever which rests against the vibrating armature.

Price _____\$1.00

Brandes Phones



The New Superior type Brandes 2000 ohms double headset receivers is one of the most efficient and sensitive phones on the market today which sells at a moderately low price. Equipped with new style heavy woven khaki covered headband. Exposed metal parts heavily nickel plated. Rustproof. Hard rubber caps. Cores of annealed Norway iron wound with No. 40 enameled copper wire to an exact number of turns giving an approximate resistance of 2000 ohms per set. Green mercerized cord, six feet in length. Polarity indicating. Guaranteed to be the most sensitive receiver for the price on the market.

Price complete_____\$8.00 Mailing weight 2 lbs.

Hear The Latest News, Concerts, Etc., With A Wireless Receiving Set

We are in a position to supply Wireless Receiving Sets of different qualities and prices, and to those who want information on constructing a set, we will gladly take up their problems with them.

Wireless Receiving Set "A"

(Hook-Up)

This set has a receiving range of about 50 miles. It is complete, ready to set up and operate. Just the thing for those who want an inexpensive outfit which will bring in wireless telephone and wireless telegraph messages. Affords an unusual opportunity to enjoy the concerts, etc., which are constantly in the air. It is made up of:

60 feet No. 2 Stranded Copper Wire.

1 L-400 Tuning Coil.

1 Crystal Detector.

1 Single Phone with Leather Headband.

Price, complete_____\$5.80

Price, v	vith	double	phones	of 2000	ohm	re-
sistan	ce .					\$8.30





Wireless Receiving Set "B"

(Hook-Up)

This is a more select type of receiver and has a receiving range of about 200 miles. The variable condenser permits tuning for various wave lengths. This receiver will bring in musical concerts, wireless messages, conversations, etc., even more clearly than Set "A" and from a greater distance. The hook-up clearly shows the connections necessary for its construction and the material included in this set. Here is a set which every one can afford and which will give satisfaction in every way.

Price complete_____\$10.30

Wireless Receiving Set "C"

This is a particularly fine set for general receiving and for all-around amateur receiving. It has a receiving range of about 500 miles. This means that all ama-



The New N. R. I. A-1 Junior Radio Receiver



Here is a Receiving Set that anyone can operate. You don't have to know anything about wireless to thoroughly enjoy and entertain yourself plucking out of the air concerts, Grand Opera Productions, speeches, news, etc., which cram the air about you.

A double coil single circuit tuner, N. R. I. newly perfected crystal detector, a two-point switch for changing from short to long waves, a fixed condenser and a set of head telephones, all in an attractive carrying case with leather handle. Complete with aerial wire, ground connector, insulators and switch. The finest kind of a Receiver for all-around service. Very light. Double wave range 100 to 800 and 800 to 3000 meters. Test Buzzer with battery and switch included.

Price, complete with single High Resistance Phone_____\$20.00 (If a double head phone is desired add \$5 for the extra phone.)

Parts For Regenerative Set Using Variometers In Grid And Plate Circuits

This is an excellent Receiving Set, having a range of from 1,000 to 3,000 miles. It is particularly well suited for picking up Wireless Telephony concerts, lectures, speeches, etc., and will do well also for Wireless Telegraph messages. It is made up of the following parts:

Loose Coupler. Grid Variometer. Plate Variometer.	B. Battery, 22½ Volts. 3,000 Ohm Receiver. Radiotron Bulb.	Murdock Rheostat. Variable Condenser. Stopping Condenser.
Grid Condenser	Murdock Socket.	
Price, complete	+	\$45,20
	(Hook-Up)	
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DeForest Honeycomb Coil Type Of Receiver



This is another excellent shortwave Receiving Set having a range of 1,000 to 3,000 miles. It is very easy to operate and to set up. Complete instructions accompany every set. It is made up of the following parts:

Honey Comb Coil Mounting for Primary, Secondary and Tickler.

3 Honeycomb Coils.

2 Variable Condensers.

Grid Condenser.

Audion Bulb.

B. Battery.

Stopping Condenser.

3,000 Ohm Receivers.

Price, complete _____\$34.50

Miscellaneous Supplies At Lowest Prices

Aerial Wire, per 100 feet	\$1.25
Electrose Ball Insulators	
Electrose 4-Ball Insulators	40
Electrose 6-Ball Insulators	
Detector Stand and Crystal	
DeForest Weatherproof Detector	
Tested Crystal, per box	25
Brandes Navy Type Phones 3,200 ohms	_ 14.00
Murdock 2,000 Ohm Phones	4.50
Murdock 3,000 Ohm Phones	5.50
Bakelite, ¼", per sq. inch .03; 3/16"	021/2
Phone Condensers, small	70
Phone Condensers, large	90
Receiving Transformers	9.00
Tuning Coils	4.50
Lightning Switch	. 3.85
Oscillation Transformer	
Antennæ Switches	
Amplifying Transformers	- 7.50
Rembler Rheostats	
Radio Corp. Patentometers	
Assorted Grid Leaks	75
Grid Condenser	25
U. V. 200 Audion Detector	
U. V. 201 Audion Detector and Amplifier	
U. V. 202 5 Watt Power Tubes	
DeForest A. C. Rectifier Tubes	
Audion Control Panels	
Audion Tube Sockets	_ 1.50
Assorted Binding Posts03 a	nd .15
15 Plate Fully Mounted Condensers .0005 mf \$8.50; unmounted	
23 Plate Fully Mounted Condensers .0007 mf 9.00; unmounted	
33 Plate Fully Mounted Condensers .001 mf 10.00; unmounted	
Variable Condenser 23 Plate .0005 mfd	- 4.00
Variable Condenser 43 Plate .001 mfd	_ 4.50
Unmounted Coils 25 to 1,500 turn from\$0.50 t	
Mounted Coils 25 to 1,500 turn from\$1.15 t	
Buchers Practical Wireless Telegraphy	
Buchers Wireless Experimenter's Manual	
Buchers Vacuum Tubes in Radio Communication	
Buchers vacuum fubes in Radio Communication	
Radio Telephony by Goldsmith	
Consolidated Radio Call Book	1.50

Why Work For Low Pay?

In four to six months you can learn to earn \$2,000 a year to start and quickly advance to \$3,000, \$5,000 and \$10,000 a year in the wireless industry. Thousands of men will be needed. Fascinating, interesting work. Learn by entertaining yourself during your spare time.



Wireless communication is pushing ahead-more and more men are needed. On land and on sea this new profession offers you a gentleman's position and a real man's salary although you can easily qualify in four to six months. Do you want to travel and see foreign countries? Learn wireless and you can travel all over the world without expense. The marvelous expansion of wireless, on the other hand is opening hundreds of positions on land-positions right near your home-which pay excellently, offer you a chance to be a leader in a short time.

You can qualify quickly right at home. Actually entertain yourself while learning.

Without obligation to yourself we would like to tell you how you can qualify quickly right at home and actually entertain yourself while learning. The air about you is crammed with radio messages, concerts, speeches sent out by wireless telephone. The New N. R. I. Method of teaching wireless utilizes this and makes preparing for your future-for a position which will pay the equivalent of \$2,000 the first year-an entertainment for yourself-the most fascinating and interesting training you have ever taken.



You can earn twenty times as much the first year you work as your training costs you.

The first year you work in the wireless field you can earn twenty times as much as your training will cost you and you can save fully \$1,000 easily. Graduates of the N. R. I. are recognized the world over as exceptionally trained men. The N. R. I. is government approved and recognized.

Send for complete information today!

Send for our booklet "Wireless, The Opportunity of Today" and let us show you the remarkable opportunities in this field

and how you can quickly qualify. Over 7,000 students have taken our course within the past few years. Read their letters yourself. Clip this coupon and send it in right now.

Mail Coupon For Booklet

NATIONAL RADIO INSTITUTE. Dept. N. T., Washington, D. C. Send me your free booklet, "Wireless, the Opportunity of Today." Tell me about the opportunities open in wireless, about your Institute, and about your special limited offer. Name Address City_____ State____

BEST COURSE IN THE COUNTRY

20 Market Street. Amsterdam, N. Y., Nov. 9, 1921.

Gentlemen: The training I have received from your Institute cannot be measured in terms of the little money it cost to secure that training. I sincerely believe that your Institute offers the very best radio course of any in the country, barring none. Yours very truly,

Charles Champ.

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