SIMON RADIO

A record of the conception and development of Radio Signalling, and especially the achievements and products of the organization of Emil J. Simon in the manufacture of Radio Apparatus of all types for all purposes

EMIL J. SIMON

RADIO ENGINEER AND CONTRACTOR

949 ~~217~~ BROADWAY, NEW YORK

Cable Address: Radioset New York

Western Union, Leibers and Bentleys Codes

1920

Sales Agencies

New York	Emil J. Simon	217 Broadway
Boston	William J. Barkley	170 Purchase St.
Chicago	Inter-City Radio Co.	Chicago Savings Bank Bldg.
Cleveland	Inter-City Radio Co.	1133 Williamson Bldg.
New Orleans	Nola Radio Co.	134 Chartres St.
London	Cyril F. Elwell	Craven House Kingsway
Paris	Cyril F. Elwell	Hotel Majestic, Avenue Kleber
Copenhagen	Industrial Trading Co.	Toldbodgade, 19
Christiania	Einar J. S. Thiis	Linaaes gate 1

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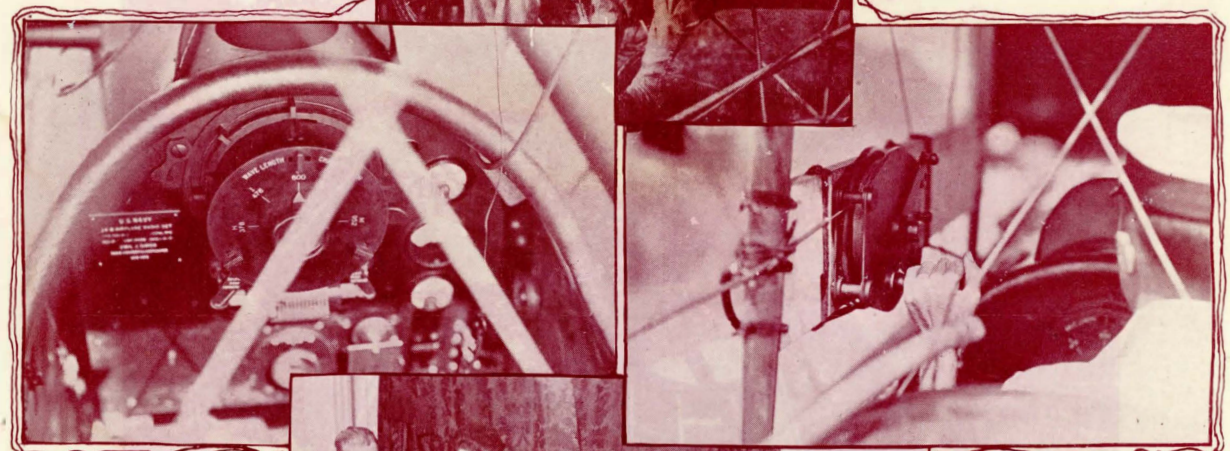
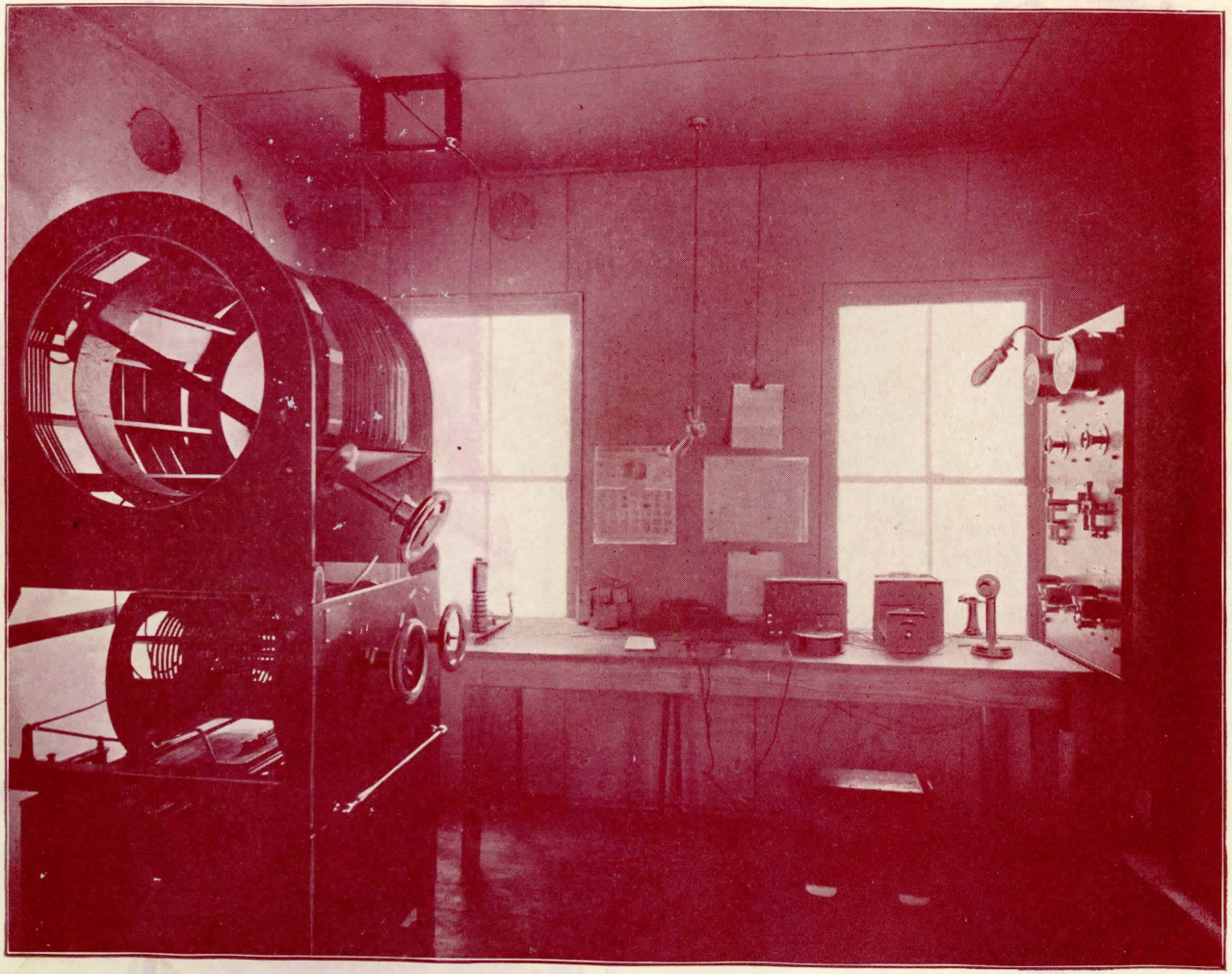
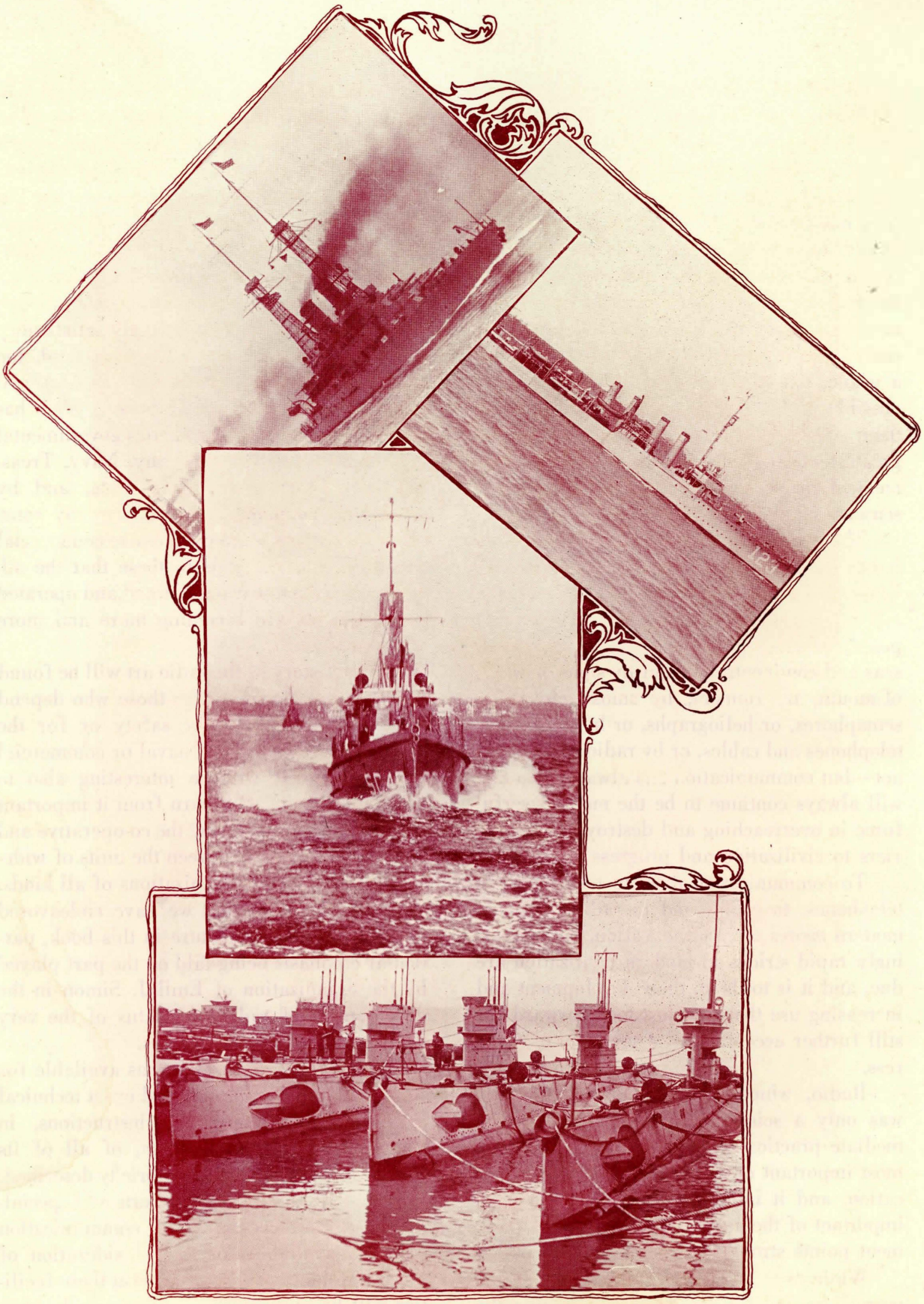


New York, 1918



First U. S. Air-Mail Radio Station, Equipped With Simon 5 KW. N I C Set



U. S. Navy Vessels of All Types are Equipped with Simon Sets

Introduction

PROBABLY the most potent single force acting on the peoples of the world in enlightening and civilizing them, in hurrying their progress, in drawing them nearer one another and linking them together in a hundred varying ways, is no longer, as of old, the sword, nor is it the pen; it is no longer the printing press, the steamship, nor the railroad; it is neither art, nor music, nor medicine, nor law, nor agriculture, nor industry, nor commerce, nor yet all of these as a whole, but it is one which makes them all possible, which aids them all and which makes them all reciprocally beneficial. This, the greatest of all influences upon the development of mankind everywhere in its broadest sense, is *communication*.

The communication of intelligence is, as it has ever been since time immemorial, the basis of all the co-ordinated efforts of men and of groups of men, whether at war or at peace, whether at arms' distance or across seas and continents, whether by signs or word-of-mouth, by runners, by smoke clouds or semaphores, or heliographs, or by telegraphs, telephones and cables, or by radio—it matters not—but communication has always been and will always continue to be the most powerful force in overreaching and destroying the barriers to civilization and progress.

To communication then, to telegraphs, to telephones, to cables and to radio—to these modern *means* of communication, the increasingly rapid strides in modern civilization are due, and it is to them, their development and increasing use that we must look forward for still further acceleration of the pace of progress.

Radio, which but twenty-five years ago was only a scientific curiosity, with no immediate practical utility, is today one of the most important of all the means of communication, and it bids fair to become *the* most important of them all. The trend of development points strongly in that direction.

While radio in the past has played a truly marvellous part on the seas in guarding the lives and property of those who traverse them, it is very rapidly becoming a no less valuable aid in the transmission overland of important information. Widespread commercial organizations which have been required by circumstances to depend on wire systems or special privately owned or leased lines for the transmission of large volumes of important information, are beginning to see the tremendous advantage of privately owned radio systems as an economical and exceedingly satisfactory substitute for the many times poor and, too oftentimes, costly services of commercial telegraph and telephone agencies. This has been realized first by the various governmental departments such as the Army, Navy, Treasury and Post Office Departments, and by steamship companies, and latterly, by some of the larger and more progressive commercial organizations, and it is to these that the advantages of such privately owned and operated radio systems are becoming more and more apparent.

A brief story of the radio art will be found interesting and valuable to those who depend upon communication for safety or for the transmission of military, naval or commercial intelligence. It will be interesting also to many others who will learn from it important suggestions for increasing the co-operative and co-ordinated efforts between the units of widespread commercial organizations of all kinds.

It is this story that we have endeavored to tell by word and picture in this book, particular emphasis being laid on the part played by the organization of Emil J. Simon in the development of radio apparatus of the very highest types for all purposes.

The Simon organization has available for distribution very complete and exact technical descriptions and operating instructions, in English, French and Spanish, of all of its products herein pictured and briefly described. The services of competent experts and specialists in all branches of radio communication are also available for the consideration of special problems, and we trust that these facilities will be availed of by all those who may find use for them.

Historical

MANY long years ago, when a few of us now living were only young men and women, just beginning to find use for the telegraph of Morse and to learn about the interesting experiments of Alexander Graham Bell in transmitting speech over a wire, and when many more of us had not yet even seen the light of day, Clerk Maxwell, a prominent English scientist and mathematician, was deeply exploring and theoretically mapping out with painstaking exactness one of the then darkest and most misconceived regions of science and natural philosophy. That utterly misunderstood natural phenomena was Light, and more particularly the manner of its propagation from place to place, through numberless millions of miles of empty space, through solids and through liquids; the whys and wherefores of its generation, absorption, reflection, diffraction and polarization; in fact, the very nature of Light itself.

And out of Maxwell's investigation came his development of the Electromagnetic Theory of Light. He believed that light was a form of wave motion in that all pervading and mysterious medium called the ether, that this wave motion was both electric and magnetic in character, and that exactly similar, but longer waves could be produced electrically which, though imperceptible to the eye as light, could be perceived by some other form of detector more suitable for their longer wave length. His conclusions, which still stand today as a masterpiece of a brilliant scientific mind, form the basis of all forms of signalling by radio, or as they are technically termed, electromagnetic waves. This, the foundation, was the first important step in the development of radio signalling.

Maxwell's profound theories fell for the most part on unresponsive ears. They were recognized by the more advanced scientific men who were able to understand their full significance, as interesting and suggestive, and apparently sound, but they were still only theories devoid of confirmation and proof by actual physical demonstrations, and as such, a target for controversies, counter theories and wandering discussions. No one, not even Maxwell himself, try as he would, could devise a way of producing and detecting these invisible light waves, which, had they only known, were flashing over the entire world, even through their very own bodies, almost constantly with every lightning stroke, condenser discharge or other electric spark.

For twenty years, the theory lived an uncertain existence, but then in 1887, came a startling announcement from Heinrich Hertz, a professor at the University of Bonn. Hertz had not only produced these mysterious waves and devised an electrical "eye" for their detection, but he had also duplicated with the greatest thoroughness every phenomena of visible light.

He produced electric waves of different lengths; he reflected them with metallic surfaces that would not absorb them; he abruptly changed their direction, or refracted them, with huge prisms of pitchblende and other materials that changed their speed of propagation; he made them bend or diffract around obstacles; he even, and without the slightest difficulty, made them pass through such ordinarily opaque substances as the wood and stone of walls and floors. In fact, Hertz demonstrated conclusively and thoroughly each and every one of the hypotheses and laws formulated by Maxwell, and, while he apparently failed to see in his laboratory experiments a method of signalling to a distance without wires, his apparatus actually provided a radio system capable of operating through distances of a few yards. The work of Hertz, therefore, constitutes the second important step in the advancement of the Radio Art. Hertz's apparatus consisted essentially of what he termed "electrical oscillators," one being used as a transmitter and the other as a receiver or detector. They were practically identical in form and consisted essentially of a pair of brass sparking balls separated by a small air gap and having stiff wires extending outward in opposite directions. Sparks were made to pass between the balls of one of these oscillators by connection to a jump spark coil, and

if the distance was not too great, similar sparks, although very much weaker ones, were observed between the balls of the other oscillator. This was indeed a most remarkable phenomena, which even today is a laboratory experiment of wondrous interest to all who witness it.

The third step, which constitutes the gathering together of the suggestions and work of Hertz and numerous other investigators was made in 1895 by Guglielmo Marconi, a mere lad yet in his early twenties, who saw in these laboratory experiments with Hertzian waves, a new and most valuable means of signalling without wires. He began his experiments on his father's estate in Italy in 1895, and in the following year, he applied for patents and made demonstrations of his apparatus in Great Britain, during which signals were successfully transmitted over a distance of about two miles.

So, thus, the art of electro-magnetic wave telegraphy, or as it has more generally come to be known, the Radio Art, after a period of formation extending over more than twenty-five years, came to be born as a means of communicating intelligence to a distance without the use of connecting wires.

Marconi's apparatus was, of course, very crude, and the radio installations of today could hardly be said even to resemble his now antiquated and obsolete equipment with which he made his early experiments.

He continued his experiments and improved his apparatus, however, and in 1901, he succeeded in sending radio signals across the Atlantic from Ireland to Newfoundland. These demonstrations attracted the widest attention the world over and soon thousands of scientific and technical men, especially in Europe and America, began to contribute improvements of both a major and minor nature, and these quickly began to strip the new wireless of its imperfections and failings and to bring it rapidly forward as a commercially practicable system of signalling, especially for use at sea. The improvements increased so swiftly in fact that oftentimes apparatus but a year or two old was scrapped as obsolete and unworthy of continued use.

Now, after an almost continual rebirth, in newer and more improved forms, extending over a period of twenty-five years, the existing radio apparatus is so totally different from the original that surely Signor Marconi himself would recognize no more than a very remote resemblance.

Today we have not only dozens of land radio stations of enormous power, transmitting constantly throughout the world to distances of thousands of miles, but tens and hundreds of thousands of radio equipments of smaller varying sizes on ships, on shore, on aircraft, on submarines, in the homes of experimenters and elsewhere. We have radio telephony, radio control of torpedoes, radio direction finding, radio artillery control and many other applications of the art, totally undreamed of in the early days even by the boldest of the scientific prophets.

The radio industry is in fact similar to that of the automobile or the steamship. Present-day radio apparatus is no more related to that of Marconi in the early days, than the modern automobiles or steamships are related to the historically interesting but hopelessly antiquated types first produced by Seldon and Fulton. And so in radio, as in these and many other fields, the alert purchaser does not necessarily seek products associated with the name of their first producer, but rather for apparatus of the very highest grade and at the lowest cost.

Many distinguished and capable inventors, engineers and designers have contributed to these marvellous developments. The Radio Art has grown to such an extent, in fact, that there are now over fifteen hundred patents pertaining to it in the United States alone. England, France, Germany and many other foreign countries, also have large numbers of radio patents.

A distinct profession of a highly technical character has grown into existence, numbering tens of thousands of engineers, designers and operators. During the war, in the United States alone, probably more than fifty million dollars' worth of radio apparatus was purchased by our Government for wartime purposes.

One of the ablest and most successful of these latter-day engineers and manufacturers, who has contributed in a large way to the high degree of advancement of the Radio Art as it now exists, is Emil J. Simon, head of the organization of radio engineers and contractors known by that name. As a pioneer in American radio technique, E. J. Simon has established much that is of fundamental importance to the engineering phase of radio, and with his organization of technical experts, has played an enviable part in the laying of its present and future foundations.

Some of the more important Simon achievements and products are briefly described and pictured in the following pages.

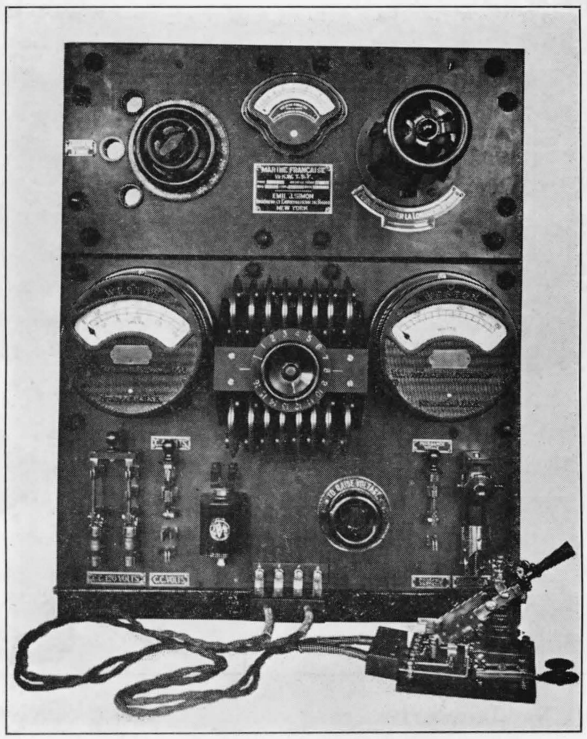
Simon Marine Transmitters

THE fact that nearly a thousand Simon panel type marine transmitters were supplied to the U. S. Navy during the war, is ample evidence of the superior character of this type of equipment, which was originated by Simon in 1911. Before that time the unit type of radio set was unknown, the various units comprising a complete transmitter being disposed about the operating room on the walls, table, ceiling and floors. The many advantages of the Simon idea of bringing all of these various units together into a single compact unit completely connected and adjusted, are apparent. The installation amounted only to connecting power, antenna and ground leads; the improvement in appearance and operation also was very marked. Practically all radio transmitters are now constructed along these same "panel" lines, first developed by Simon.

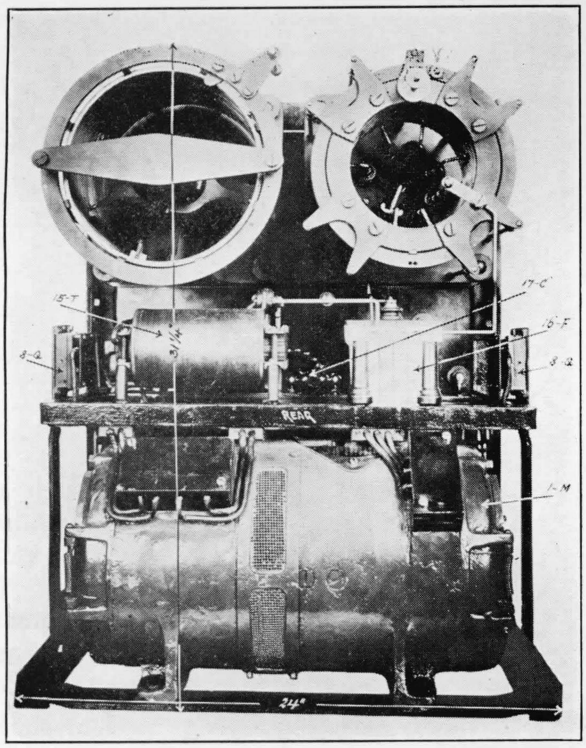
These Simon panel transmitters have been built in sizes varying from ½ kw. to 5 kw. and may easily be built up to 10 kw. They consist essentially of a vertical insulating panel, on the face of which are mounted the various instruments and controls, and in the back of which the other units, such as transformer, condensers, oscillation transformer, power transformer, condensers, etc., are attached. The motor generator is mounted at the rear of the panel on a framework attached to the panel. The entire arrangement thus produced, as shown by the various accompanying illustrations, is exceedingly compact, and presents the ideal type of set.

A few of the representative types and sizes of these panel transmitters as supplied the United States and foreign Governments are shown in these illustrations. These sets have been used very extensively for service in submarines, torpedo boats and submarine patrol boats, and they have alsobeen found splendidly adapted to the requirements of shore stations for ranges up to 500 miles.

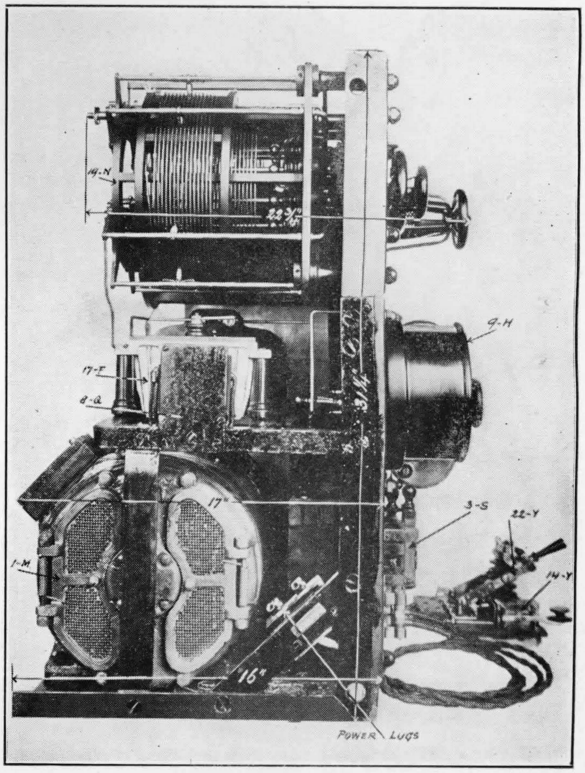
No finer, more efficient, nor more completely satisfactory sets have ever been built by any manufacturer. They represent the highest existing examples of the radio designer's and manufacturer's art.



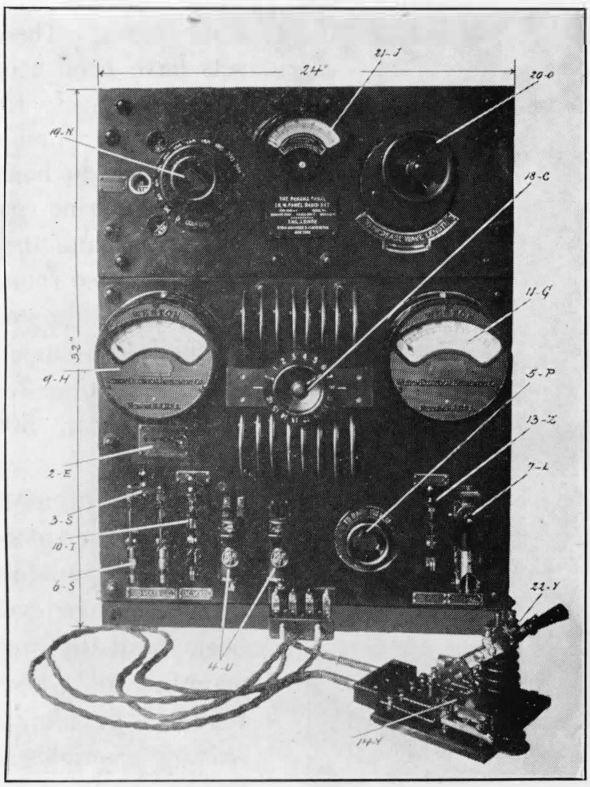
SIMON ½ KW. FRENCH MARINE TRANSMITTER



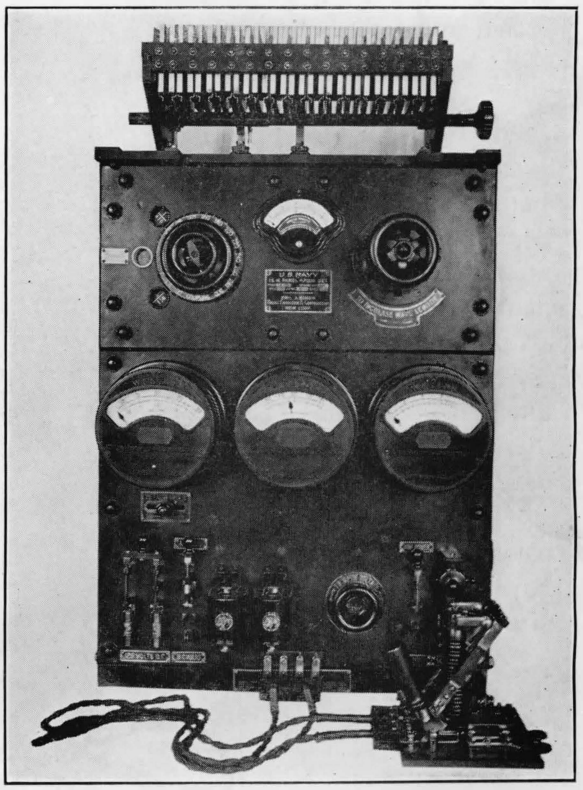
Rear View Simon French Marine Transmitter



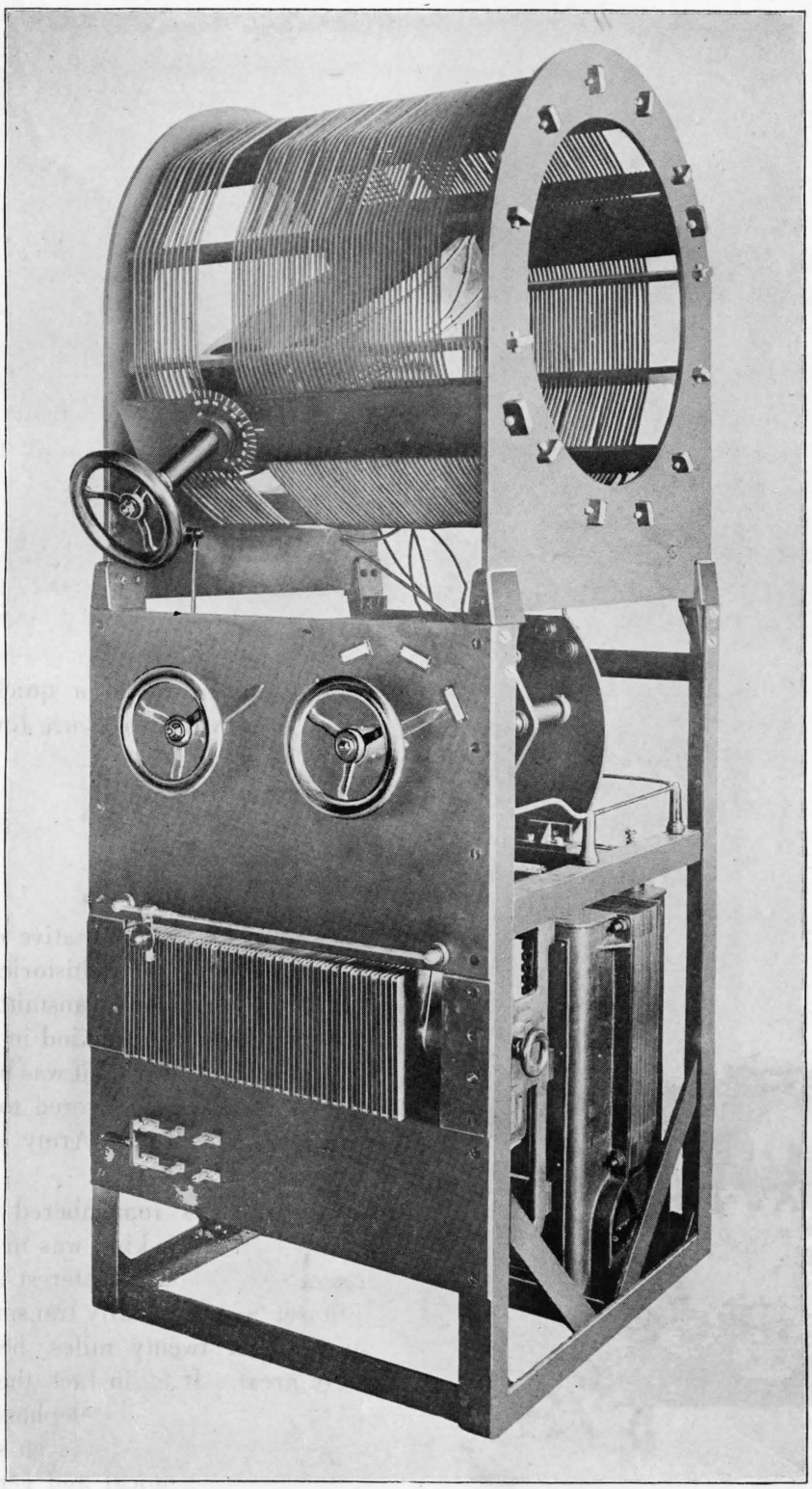
Side View Simon ½ Kw. Transmitter



Simon Panama Canal 1 Kw. Transmitter



Simon U. S. Navy 1 Kw. Panel Radio Set



U. S. Post Office Department Air-Mail Transmitter

Post Office Department Air Mail Transmitter

THE cut on the opposite page shows the 5 Kw. size of our N I C type quenched spark transmitter as supplied to the Post Office Department for Air Mail Service communication.

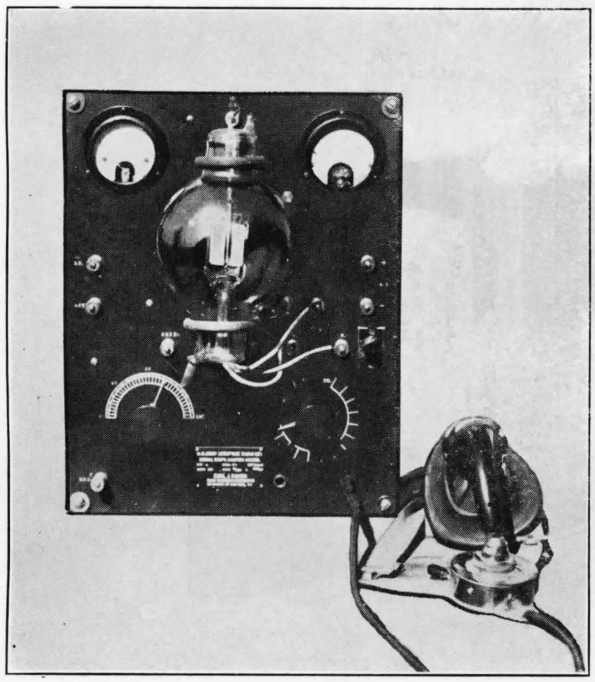
This apparatus is designed to provide a simple and reliable medium power transmitter for land station use over distances of from 250 to 500 miles. It operates on the proven reliable quenched spark principle and utilizes the high efficiency standard units developed for the U. S. Navy Radio Service. Basic improvements have been made whereby the efficiency of the transmitter and simplicity of adjustment are greatly improved.

These sets are designed for use in land stations where 60 cycle 3 phase 220 volt power is available for driving the 10 H.P. induction motor of the motor generator set. The generator of this set supplied 5 kilowatts at 500 cycles and 250 volts to the transformers, which are provided in duplicate and which raise the voltage to 12,500 for charging the condenser system.

In the improved oscillation circuit of this set the antenna is charged in parallel with 8 Dubilier Mica Navy Standard condenser units to an effective voltage of 12,500. The antenna and condensers then discharge through the quenched gap at two different oscillation frequencies. The currents thus generated oppose each other and after several oscillations the quenched gap becomes non-conductive. This causes the oscillations to flow through the antenna, antenna loading coil, condenser and ground; since this path is of low resistance, wave-trains of very low damping are produced.

The antenna used with these sets should have a capacity of at least 0.002 microfarads so as not to create too high antenna voltages. The wavelength range of the set is from 600 to 3,000 meters, and a quick wave-change switch is provided to secure four wavelengths within that range.

Aero Telephone Set



ORIGINAL AIRCRAFT RADIO TELEPHONE TRANSMITTER

STRIKINGLY illustrative of Simon radio pioneering is this historically interesting radio telephone transmitter for aircraft, which is the first of its kind in this country, if not in the entire world; it was built in the summer of 1916 and delivered to Colonel C. C. Culver of the U. S. Army Air Service in November of that year.

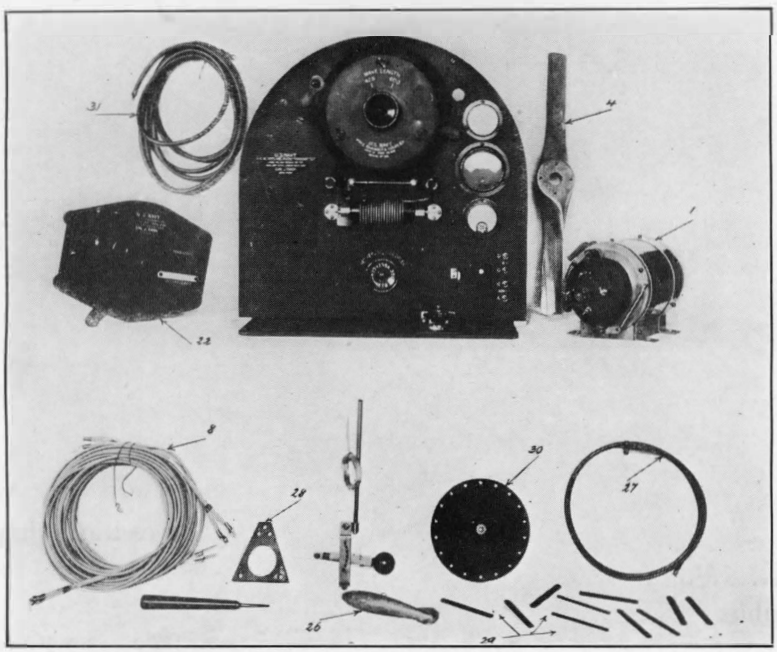
When it is remembered that no radio equipment of any kind was in general use on aircraft in 1916, the interest attached to this little set, which actually transmitted telephone speech over twenty miles, becomes increasingly great. It is, in fact, the forerunner of all the aircraft radio telephone achievements that have of late been given such wide publicity in the technical and general press.

A glance at the accompanying photograph is sufficient to indicate strikingly, the simplicity of the apparatus and construction.

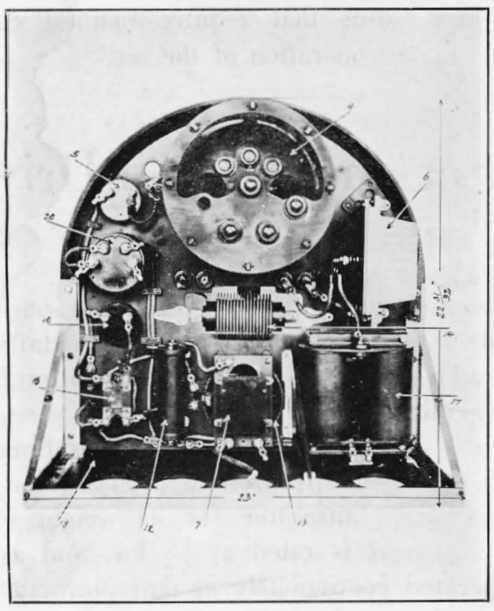
Simon ½ Kw. Aircraft Transmitter

THE Simon ½ kw. Aircraft Transmitter was standardized by the Navy for use on Naval aircraft as a result of competitive tests on aircraft transmitters submitted by all the leading radio manufacturers of this country, and in addition, the best set used by the French Government. Over 250 of these sets have been supplied by Simon for U. S. Navy and Army aircraft, and 100 sets were manufactured on royalty arrangements by other radio manufacturers.

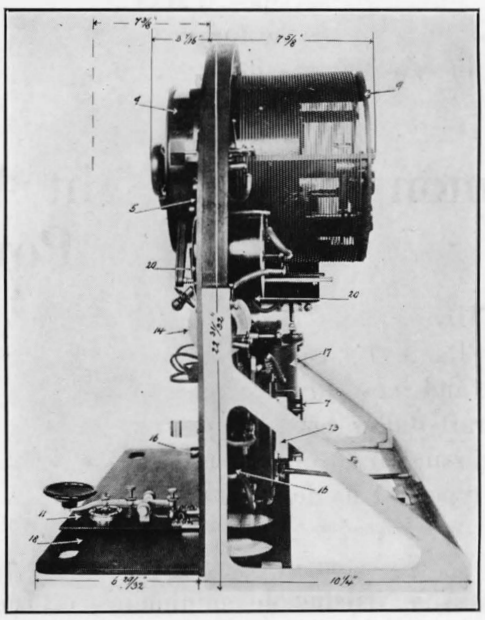
This transmitter is designed to afford re-



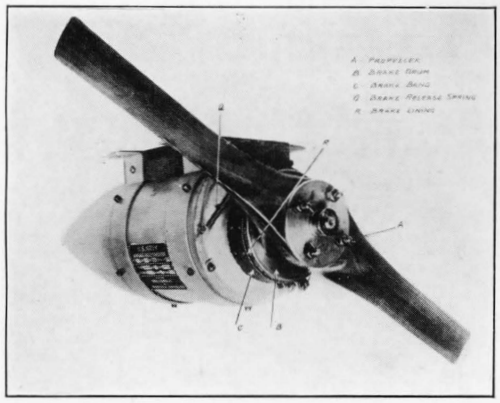
COMPLETE SET OF PARTS FOR SIMON ½ KW. AIRCRAFT RADIO SET



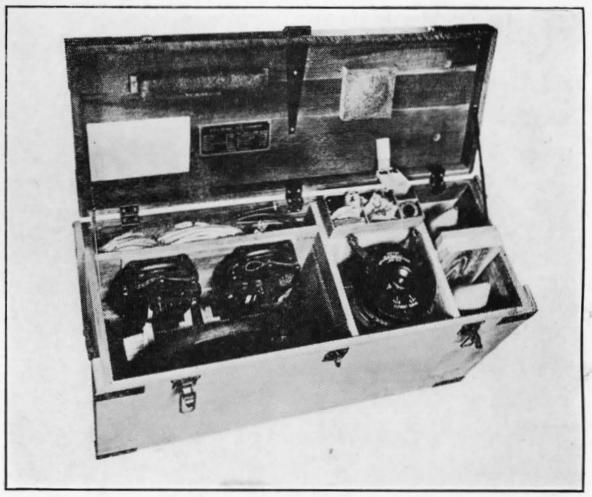
SIDE VIEW AIRCRAFT TRANSMITTER



REAR VIEW AIRCRAFT TRANSMITTER



SIMON ½ KW. 500 CYCLE AERO GENERATOR



COMPLETE AERO SET WITH SPARES IN SHIPPING CASE

liable radio transmission from aircraft for a distance of about 150 miles. In actual tests it has shown itself capable of transmitting 250 miles without difficulty. Its weight complete, including all necessary installation accessories, is 85 pounds.

The transmitter consists essentially of two parts, viz: (1) the propeller-driven generator, which is provided with a suitable pressed steel wing fitting for mounting in an exposed location for air driving, and (2) the panel on which are mounted the transformer, condenser, inductance, spark gap, meters, etc., and which is supported within the fuselage of the airplane or dirigible.

The entire transmitter has been carefully designed satisfactorily to meet the extremely severe service conditions imposed on all aircraft apparatus, and special attention has been given to obtaining the lowest possible weight with the greatest possible transmitting range, and to provide the greatest possible electrical and mechanical reliability.

The transmitter is of the 500-cycle quenched spark type, equipped with a special form of wave-changer, adjustable for two wave lengths, namely, 425 and 600 meters. The generator is equipped with a brake which serves to start and stop it as desired.

Special precautions have been taken to guard against fire, by enclosing all sparking contacts; against vibration, by properly locking all screws and nuts; against moisture, by enclosing the most essential units; and against the danger of shock to the operator from high voltages by properly insulating all high tension units that require manual control during the operation of the set.

Simon Light Weight Aero Set and Engine Driven Power Unit

THIS Simon ½ kw. lightweight Aircraft Radio Transmitter represents the latest and most advanced development in the Aircraft Radio Art. While in operation it is not dissimilar to older sets of the same general type, yet its design and outward appearance present very favorable contrasts.

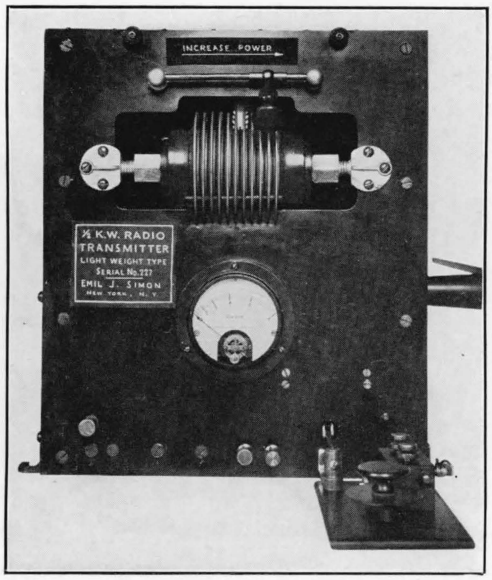
The reduction of weight and size to the practically irreducible minimum consistent with reliability, and the elimination of all unnecessary parts has been carried out thoroughly and to the very smallest details. It can be supplied either with a propeller-driven generator, or with an engine-driven generator, as shown in the accompanying illustrations. As a result this set represents probably the most powerful transmitter for its weight in existence. It is rated at ½ kw. and can be operated continuously at that power; it can even be overloaded up to three-fourths kw.

for short periods, and radiation currents as high as eight amperes can be produced, yet the total weight of the entire set installed is no more than 60 pounds. It is easily capable of transmitting 250 miles, and under favorable conditions, 500 miles can be reached.

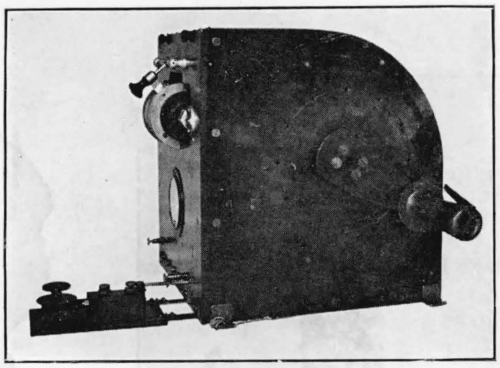
The transmitter is of the quenched spark type, operating with a 1,000-cycle generator, and either a 500-cycle or a 1,000-cycle spark note may be obtained by spark gap adjustment The generator is self-excited and is provided with a manually controlled brake and with a suitable wing fitting. The antenna reel is mounted within the set itself and thereby greatly simplifies installation and reduces the weight of reel supports and fittings. One wave length only is provided for, but this may be fixed at any desired value near 300 meters. The hinged key is so arranged as to control all necessary switching in shifting from transmitting to receiving. Tuning adjustments are made by coupling and antenna reel, and the power is varied by spark gap adjustment.

The engine-driven generator unit, while considerably heavier than the propeller-driven generator, eliminates the head resistance of the wing-mounted unit which, under some conditions, may have a dead weight equivalent of several times the true weight. This unit makes transmission possible when the aircraft is at rest and also provides a power plant for other varied purposes, such as heating, lighting, etc.

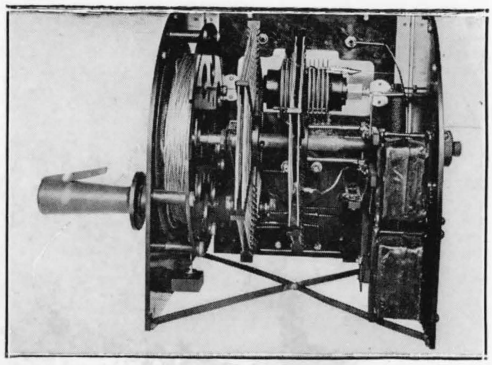
The engine is a modification of a well-known motor cycle engine and is provided with separate fuel tank, and with easy starter. Perfect speed regulation is maintained by the use of a back contact key load consisting of an appropriate condenser and resistance. The engine-driven equipment is particularly suitable for aircraft of the larger types.



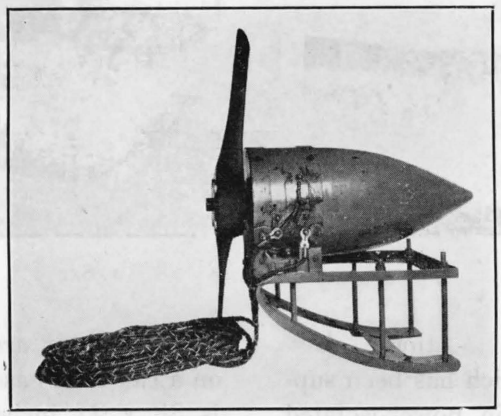
½ Kw. Aero Radio Set



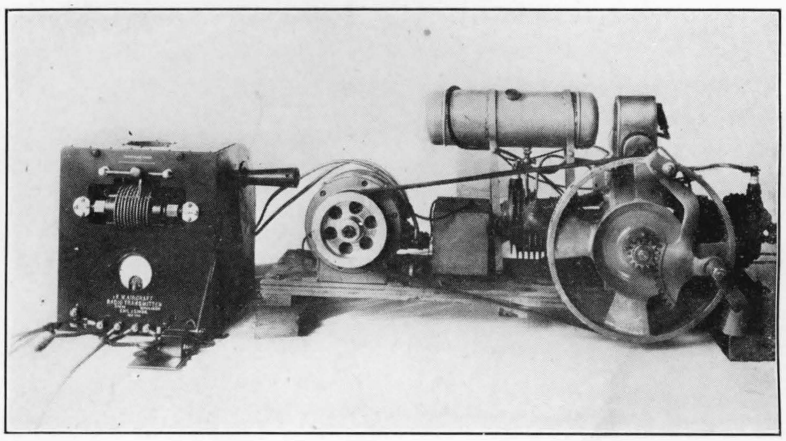
½ Kw. Aero Radio Set



Internal View of Aero Set



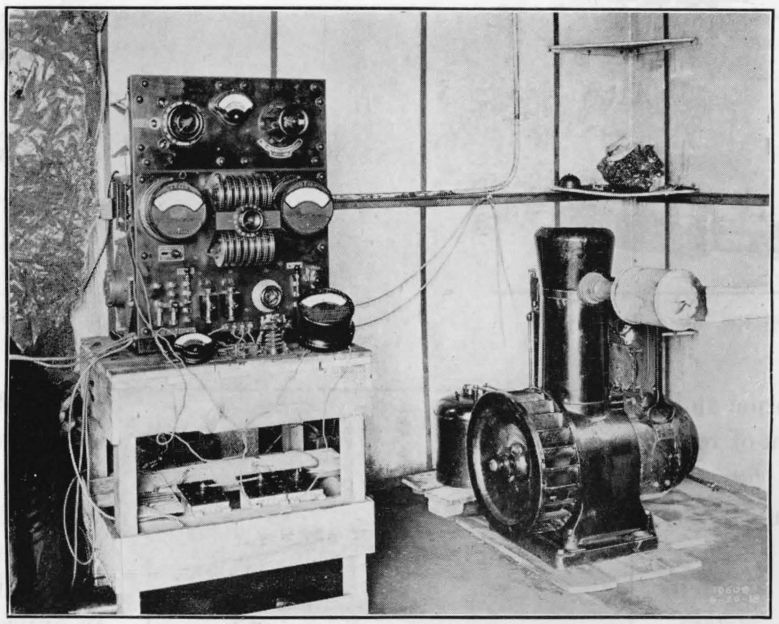
900 Cycle ½ Kw. Aero Generator



Lightweight Aero Set with Engine-driven Generator

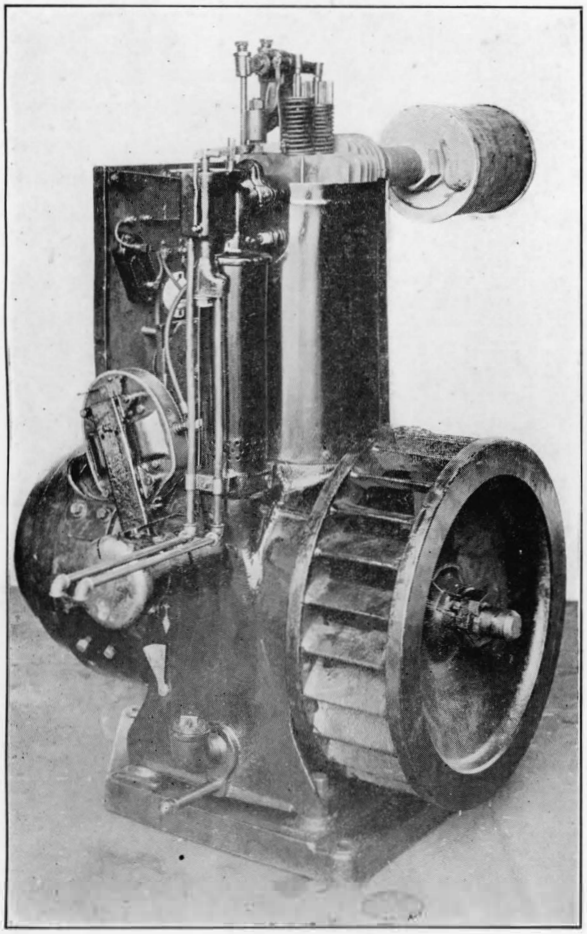
Isolated Station Equipments

FOR radio installations in localities where electric power is not available, or when an entirely independent primary power source is desirable, we supply gas engine-driven generating equipments, especially suited for this service.



Independent Power Plant 1 Kw. Set

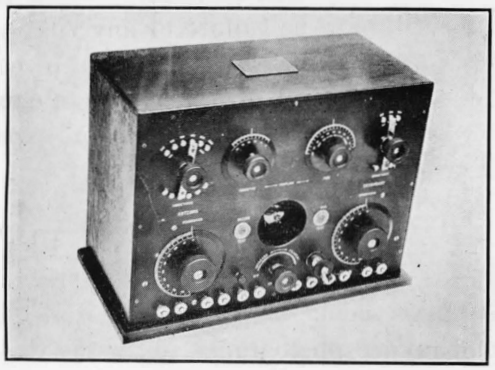
The accompanying illustrations show equipment of this nature which has been supplied to the U. S. Army in power-isolated locations. The generating unit consists of a 3 kw., 120 volt compound-wound direct current generator, direct connected to a single cylinder, four cycle valve-in-head, air-cooled, internal combustion engine. This engine will operate satisfactorily on gasoline, kerosene distillate, or illuminating gas. Both engine and generator are mounted as a single unit on a cast-iron base. The floor space occupied is 38 x 21 inches; its height is 40 inches, and its net weight is 600 pounds.



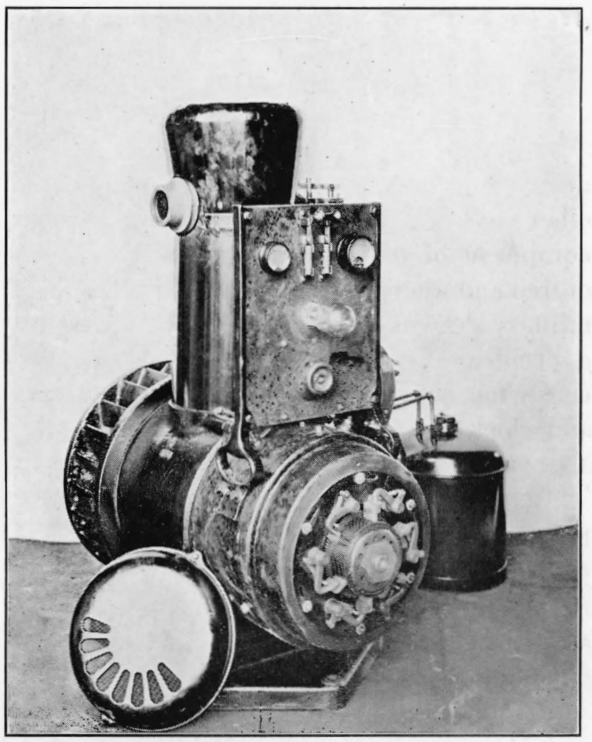
Gas Engine and D. C. Generator

This power unit will operate any of our standard 1 kw. quenched spark sets, such as is shown in one of the accompanying views of a complete set of this type under test with a phantom antenna. The transmitter itself is equipped with a standard 500 cycle motor generator fed by the gas engine power unit above described. A suitable electric signalling system for use between the radio room and the engine room is provided which enables the operator to direct the engineer as to the power requirements, without undue delay.

While this generating unit is provided particularly for use as a power source for the radio motor generator, it is evident that in most cases, because the radio transmitter is only used intermittently, it may be used for other purposes, as for instance, the charging of storage batteries for electric lighting or other electric power requirements. Where these auxiliary power requirements are quite large and constant, the gas-engine unit may be operated continuously for storage battery charging, and a switch may be provided in the radio operating room, whereby the operator can throw the generator from the storage battery load to the radio load, when transmitting, in order to avoid voltage fluctuations on the lighting load during transmission. Such auxiliary use not only permits of double operation of the power equipment, but dispenses also with the necessity of an engine attendant constantly on duty, and provides in addition for more rapid radio operation inasmuch as no delays are occasioned in starting and stopping the engine.



Simon U. S. Army Radio Receiver



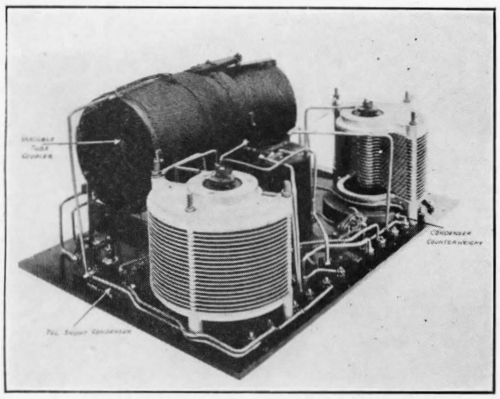
Generator End, Cover Removed

Receiver

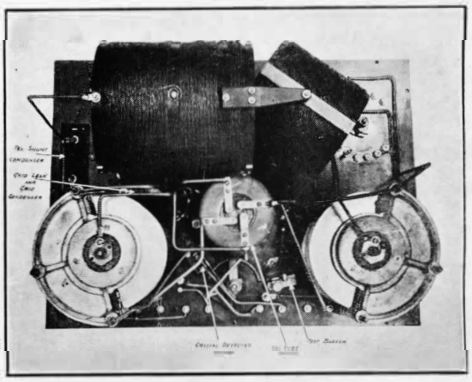
The receiver for this equipment is designed for reception of spark and arc signals using an Army VT-1 vacuum bulb for reception of both arc and spark signals, and a galena crystal detector for the reception of spark signals. The filament rheostat, when turned with pointer down, connects the crystal detector in circuit for reception and disconnects the vacuum detector.

The wave length range of this receiver is from 250 to 3,000 meters on antennae, having capacities ranging from .0004 to .0008 microfarads. The range of the tuned secondary is from 250 to 3,800 meters.

The receiver is excellently designed and constructed.



INTERNAL VIEW SIMON U. S. ARMY RECEIVER



INTERNAL VIEW SIMON ARMY RECEIVER

Simon NIC Transmitters

THE transmitter shown in the accompanying photographs, and which is of the 500 cycle, quenched spark type, has been designed especially for Merchant Marine and other commercial communication uses, where equipment of the most advanced type is required and where the cost of more complicated military designs is prohibitive. It represents a decided advance in radio engineering because the chief points governing its design, and which are quite evident in the illustrations, are compactness, simplicity and dependability.

Particular attention is called not only to the simplicity and ruggedness of the purely physical design of this transmitter, but also to its simplicity of adjustment and control, as evidenced by the unusually small number of manual control handles.

Another noticeable feature, highly important, because it insures reliability, is that practically all of the component parts of these equipments, such as motor generators, transformers, reactances, protection appliances, indicating instruments, condensers, spark gaps, etc., are identical with those employed in hundreds of radio sets supplied to the United States and foreign governments during the war, and which are giving eminently satisfactory results in service today. When it is remembered that the failure of any vital part places the transmitter completely out of commission, the necessity of purchasing an equipment constructed of no untried or experimental parts, is clearly evident.

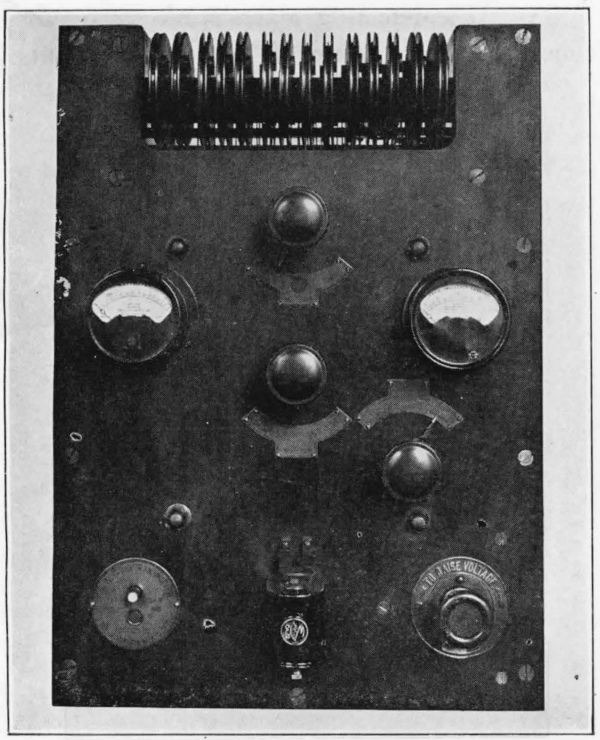
These transmitters are being built in varying sizes, namely, ½, 1, 2, 5 and 10 kw., the same general design, appearance, and construction being used for all sizes. The accompanying photographs show the 1 kw. size.

THIS transmitter differs from our previous types also in the separation of the motor-generator from the panel frame, thus permitting installation of this unit where most convenient and accessible.

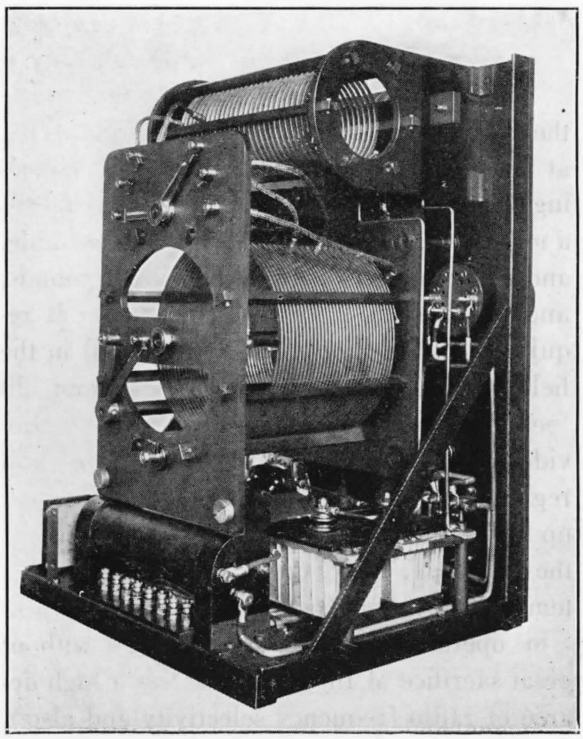
The panel and its strong angle iron frame furnishes a support for all the necessary units comprising the transmitter exclusive of the motor generator and transmitting key. Switch handles and all operating adjustments are so mounted as to be within convenient reach of the operator. Indicating instruments, likewise, are so mounted that they may be observed without difficulty from the operator's chair. The danger of accidental high voltage shock is also greatly minimized in the construction of this transmitter, since the only high voltage unit mounted on the front of the panel is the spark gap.

Three wavelengths are usually provided for and any of these may be obtained at will by a turn of the wave-change switch and a slight readjustment.

An automatic starter is provided for the motor-generator, complete control for starting and stopping being obtained by a push button switch and voltage control by a rheostat handle, both mounted on the panel. An antenna transfer-switch is also incorporated within the transmitter.

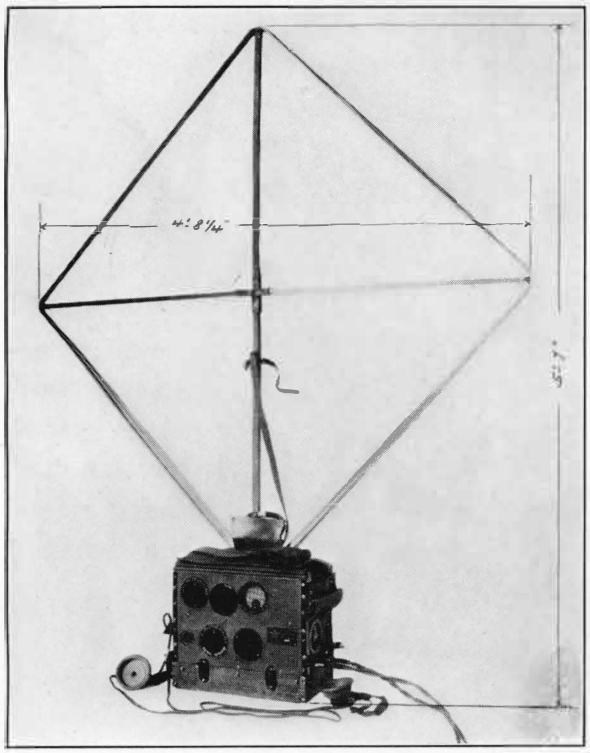


SIMON 1 KW. NIC TRANSMITTER



REAR PERSPECTIVE OF SIMON NIC 1 KW. TRANSMITTER

U. S. Signal Corps Battalion Regiment Loop Set —Combined Transmitter and Receiver



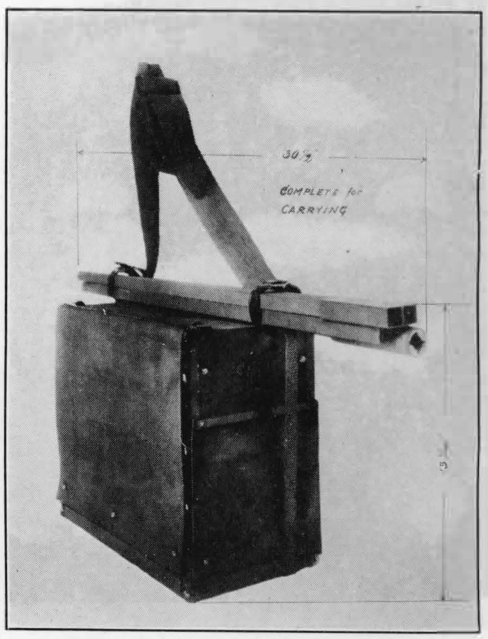
SIMON U. S. ARMY S. C. R. 112 LOOP SET

THIS is one of the most interesting radio sets ever devised, and although only a few were constructed before the end of the war, plans had been made for supplying at least 5,000 of them for the then forthcoming Allied spring drive of 1919. It is indeed a most remarkable set. It is entirely portable, and self-contained, weighing only 28 pounds, and can be transported by one man. It requires no antenna and can be operated in the field, in trenches, and even in a dugout, 20 feet underground. Its purpose was to provide communication between battalion and regiment and posts of command, at distances up to five miles. It was developed to replace the French T. P. S., or ground telegraph system, which it was found impossible to maintain operative during barrage fire without great sacrifice of life. It possesses a high degree of radio frequency selectivity and also a considerable additional selectivity made possible by the marked directional characteristics of the "loop."

Detail

The transmitter is a quenched spark two circuit system, excited by a 500 cycle buzzer-transformer driven by a 10 volt, 25 ampere hour storage battery. Inductively coupled to the primary circuit is a "loop" circuit, one meter square, which consists of a coupling coil in series with the loop and a mica condenser of the Dubilier type. A small oil condenser for vernier tuning of the loop is placed in parallel with the mica condenser. Three wave lengths are provided, namely, 110, 123 and 140 meters. In transmission all three turns of the loop are connected in parallel to obtain low resistance in the loop circuit.

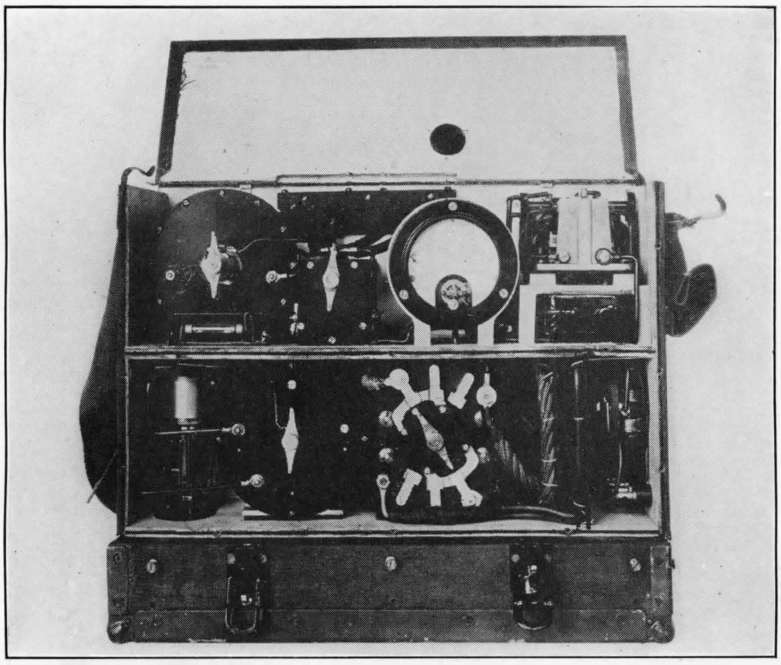
The receiver consists of two turns in the loop, series connected, and placed across the previously mentioned vernier oil condenser. This gives a wave length range of 85-165 meters. The detecting device is a VTI vacuum tube. The circuits are so arranged that this



S. C. R. LOOP SET COMPLETE FOR CARRYING

tube may pass from the detecting to the oscillating stage and operate on the intermediate or regenerative positions.

Using two such sets, satisfactory operation may be maintained over land at five miles' distance, and underground at about two miles. With the addition of a two stage amplifier, the distance can be trebled.



Internal View S. C. R. Loop Set

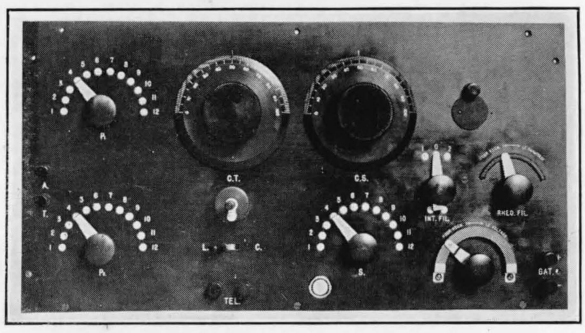
Simon French Marine Receiver

THIS receiver, of which a considerable number were supplied the French Government during the war, is of the direct-coupled two circuit type, arranged for crystal detector pick-up work, and for heterodyne reception for sustained wave signals. Spark signals can also be received with considerable amplification on heterodyne reception. The wave length range is from 300 to 3,000 meters on antennae ranging in capacity from .0004 to .0007 microfarads.

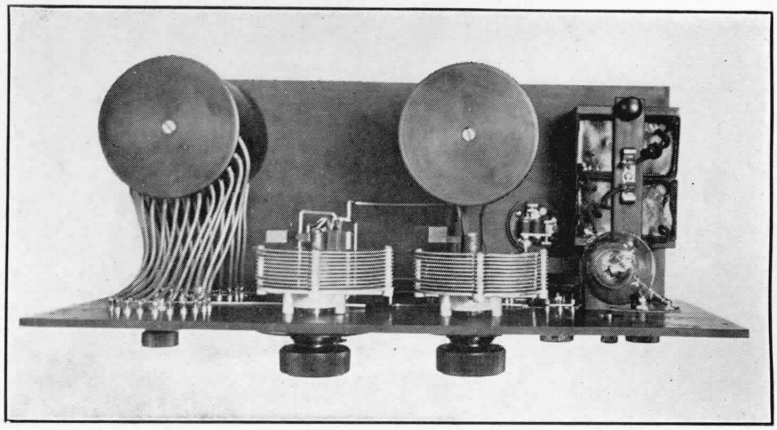
The receiver parts are mounted on a vertical bakelite panel, which forms the front face of the cabinet.

At the left of the panel are mounted the series antenna inductance with two 12-point control switches. This inductance is a single layer coil wound with fine wire for the large steps and with heavy wire for the small steps. It is mounted vertically behind the panel on a sub-base attached to the panel. The upper and lower 12-point switches control this inductance in large and small steps respectively. The total inductance is thus made variable in 144 equal steps. The unused portion of the large step inductance is always short-circuited to prevent absorption of signal by useless oscillations in this part of the coil.

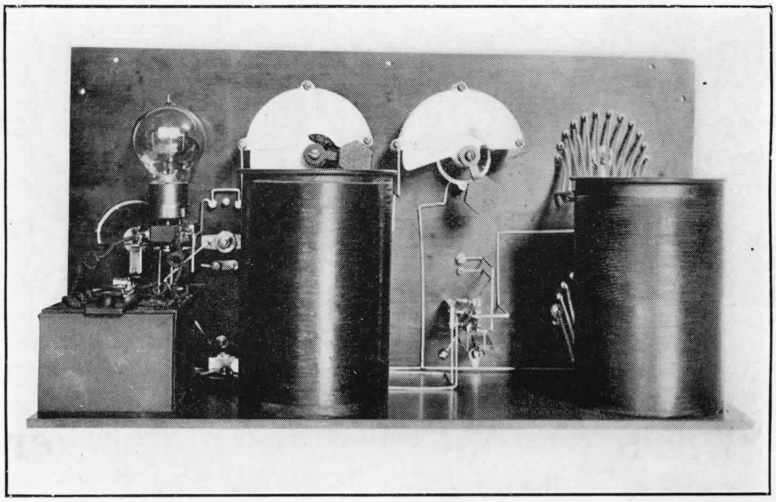
When using the crystal detector for listen-



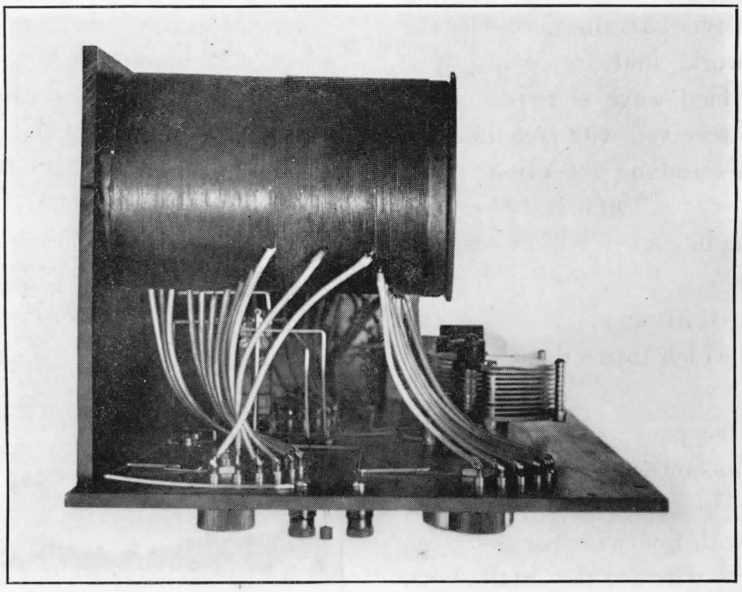
Simon French Marine Receiver



Top Internal View French Marine Receiver



Rear Internal View French Marine Receiver

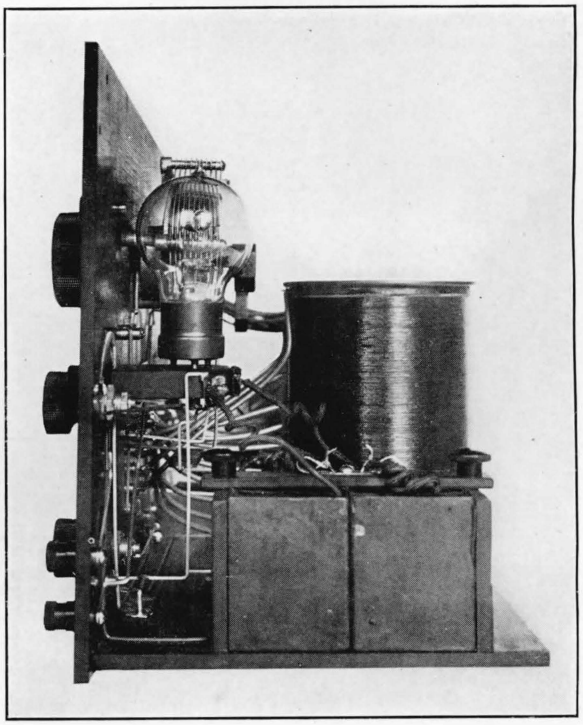


Left Side Internal View French Marine Receiver

ing-in work, the telephone with stopping condenser and the detector are connected in shunt to the antenna inductance, all the remaining condensers and inductance being left out of circuit. This condition is obtained by throwing the cam switch to the right position marked "C."

The secondary circuit consists of two variable air dielectric condensers and a step-wise inductance all connected in series across the antenna inductance. The condenser marked "CT" serves mainly for varying the coupling between the secondary circuit and the antenna and also for obtaining oscillations in the secondary circuit. Secondary circuit tuning is performed with the condenser Cs and the inductance S. A standard French oscillating bulb is used with this receiver.

Two 4-volt storage batteries are supplied with each receiver, so that one may be recharging while the other is in use. A charging panel is also supplied for these batteries.



RIGHT SIDE INTERNAL VIEW FRENCH MARINE RECEIVER

Aero Receiver

AS with aircraft transmitters, Simon's pioneer work on aero receivers is equally important. The special aircraft receiver here shown is probably not only the first but also still the finest example of such receivers ever constructed.

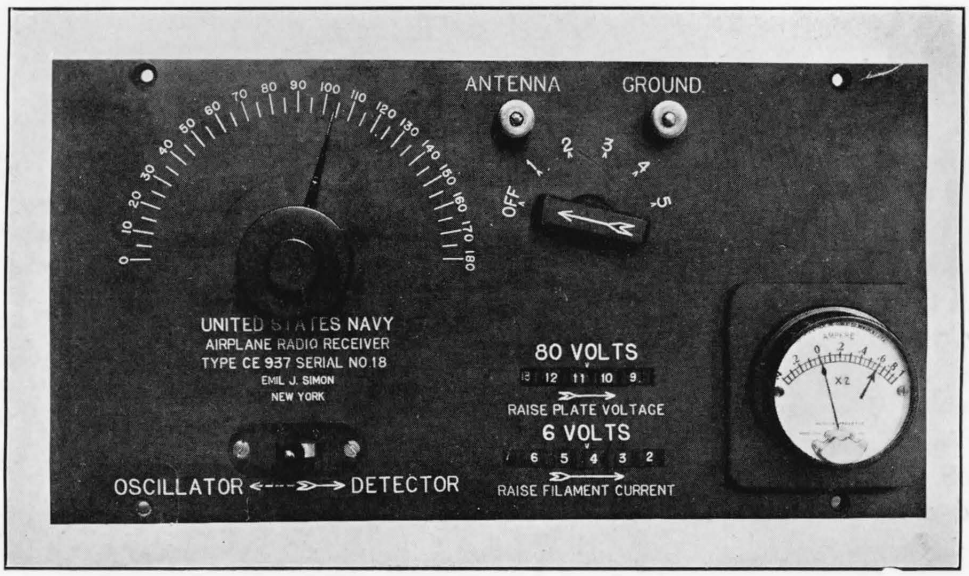
Over a hundred of these were built on a single order for the U. S. Navy aircraft service. In actual use in aircraft and ground stations of the air service, these equipments have received the highest approval, not only of radio experts and engineers, but also of operators who have used them under extended service conditions.

The receiver is designed for operation on airplane antennæ having capacities varying from .00029 to .00035 microfarads, at wave lengths from 275 to 2,500 meters. It is portable, entirely self-contained, and ruggedly constructed to withstand the shock and vibration conditions encountered on aircraft. Its weight complete, but exclusive of batteries and telephones is only 10.5 pounds.

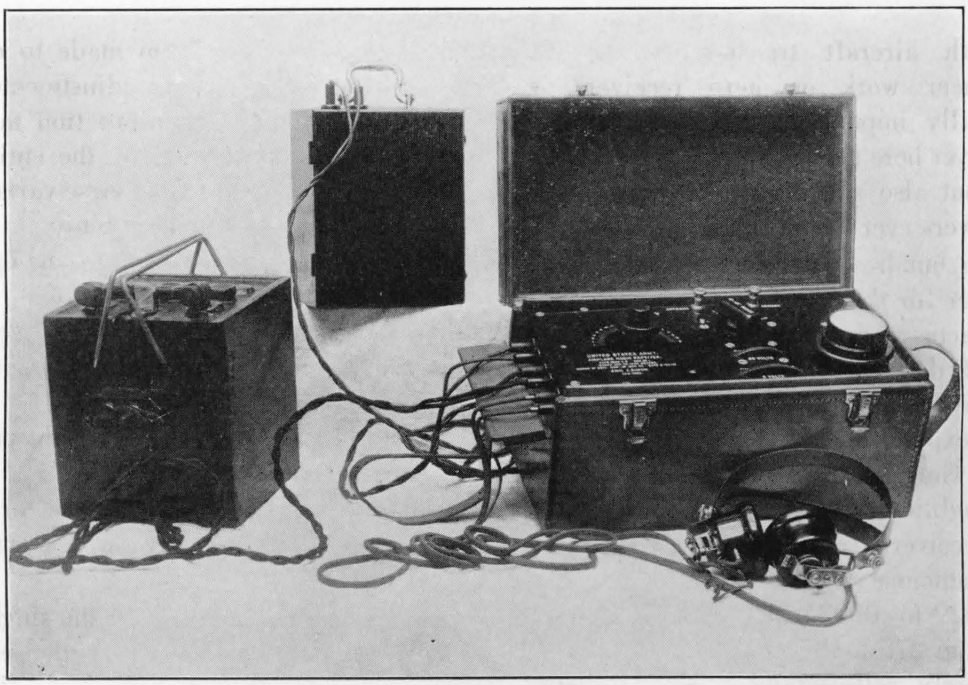
Every effort has been made to minimize the number of operating adjustments. Only two handles require manipulation in varying the wave lengths throughout the entire range of the instrument, one for coarse variation and one for fine variations or tuning. Two external batteries are required for its operation, one of 80 volts and another of 6 volts, as shown in the illustration. The dials are of the radiolite type which permit operation in total darkness.

The detector is of the vacuum tube type, using a Western Electric Type "J" tube, and it may be used either as a detector or as a regenerative amplifier by the movement of a switch handle.

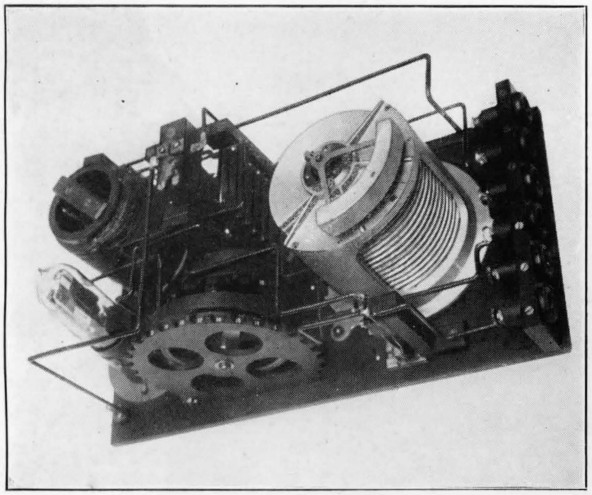
The receiver circuit is of the single, tuned type, utilizing a variable air condenser, a bank wound inductance coil, and a multiple switch. The latter, having four positions, serves to vary the amount of inductance, and to change the connections of capacity and inductance from parallel to series.



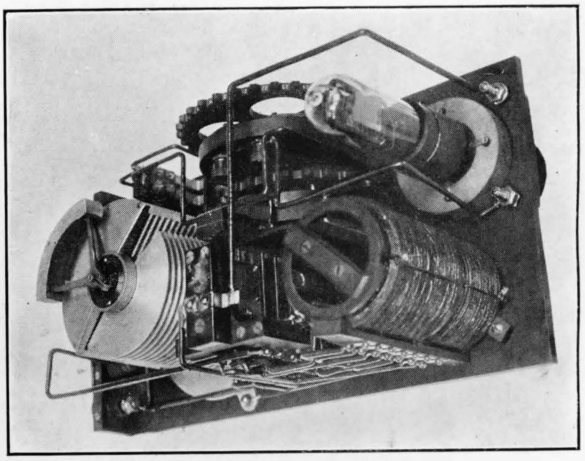
Simon Navy Aero Receiver



Aero Receiver Set Up for Operation as a Ground Station



INTERNAL VIEW AERO RECEIVER



INTERNAL VIEW AERO RECEIVER

It possesses a high degree of selectivity, which is due mainly to the extreme care exercised in eliminating distributed capacity throughout the coils and connections, and to the proper choice of coil dimensions and windings.

The regenerative operation provides for a 20-fold amplification over the ordinary audion connection and its range is thus considerably increased. The shock proof mounting for the vacuum tube provides excellent vibration insulation, so that additional amplifiers may be used for greater ranges without undue tube vibration noise.

Simon NIC Receiver

THIS receiver design is the result of our purpose to develop a commercial instrument of low cost, simple in construction and operation, and yet equalling the very best and highest priced receivers obtainable in efficiency and selectivity. Since it is of the single circuit type, consisting of a single resonant circuit in series with the antenna, it is at once simple in design and operation, and, therefore, inexpensive, and also easy to operate. It is compact and of the best design and construction.

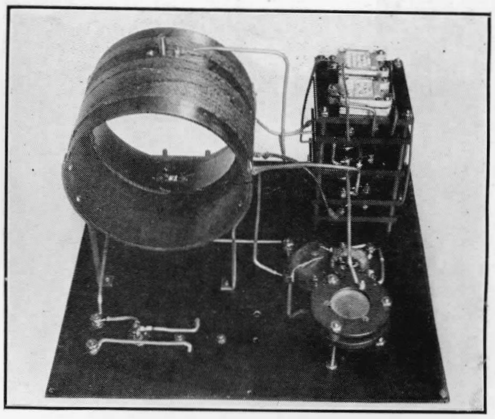
The wave length range of this receiver is from 250 to 3,000 meters on antennæ having capacities ranging from .0006 to .0015 microfarads. The wave length range is selected by a multiple switch, and fine tuning is performed with a variometer. A coupling condenser is provided which permits variation from very tight coupling for stand-by reception, to very loose coupling for highly selective reception, corresponding to a decrement variation of from about .3 to .02 or less.

Two galena crystal detectors with changeover and short-circuiting switch are provided, which are capacitatively coupled to the antenna through a 3-element condenser in a new circuit of our invention.

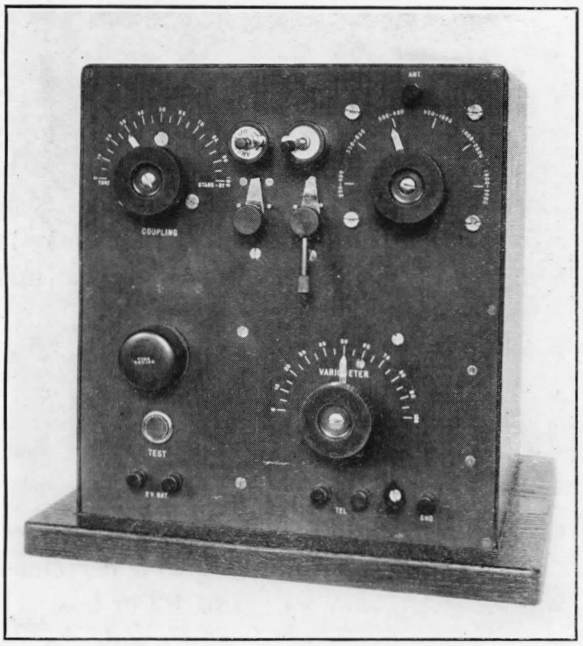
The coils of this receiver are wound in banked formation with litz wire. The spools and windings are oven-dried and baked with a special electrical low loss varnish to prevent increased losses in damp weather. The wave length selector switch is of a new design and has extremely low capacity and dielectric losses. It connects the coil sections in series or parallel and short circuits the unused sections at the appropriate wave lengths so as to give an inductance of minimum high-frequency resistance and absolutely free from

internal absorptive oscillations. Series mica condensers, which also are controlled by the above-mentioned switch, are provided for receiving on wave lengths below 500 meters.

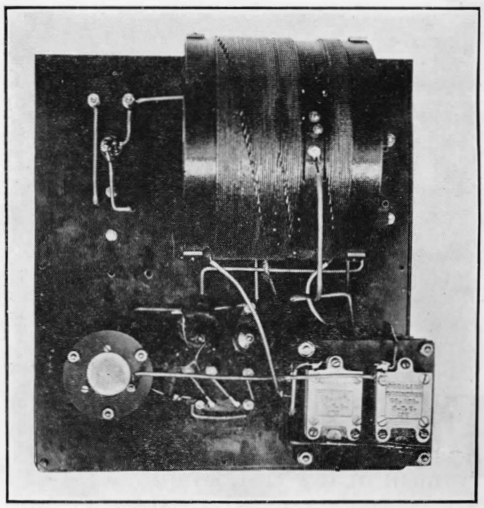
The losses in the receiver itself, with detector coupled most loosely, are surprisingly low, and correspond to a decrement of only .016 average. Because of the high efficiency, the receiver gives signals from three to five times as loud as other commercial receivers, when used on efficient antenna such as are usually obtainable on shipboard.



Perspective Internal Rear View N I C Receiver



Simon N I C Receiver



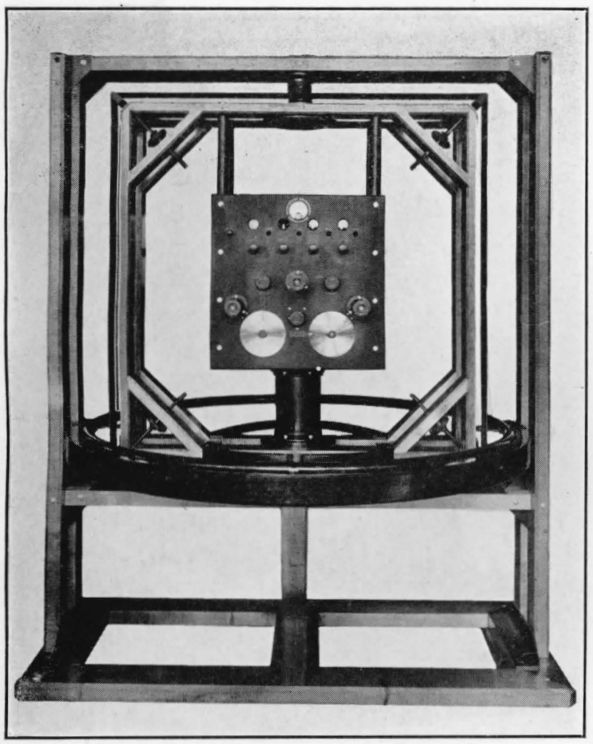
Rear Internal View N I C Receiver

The Simon Radio Direction Finder

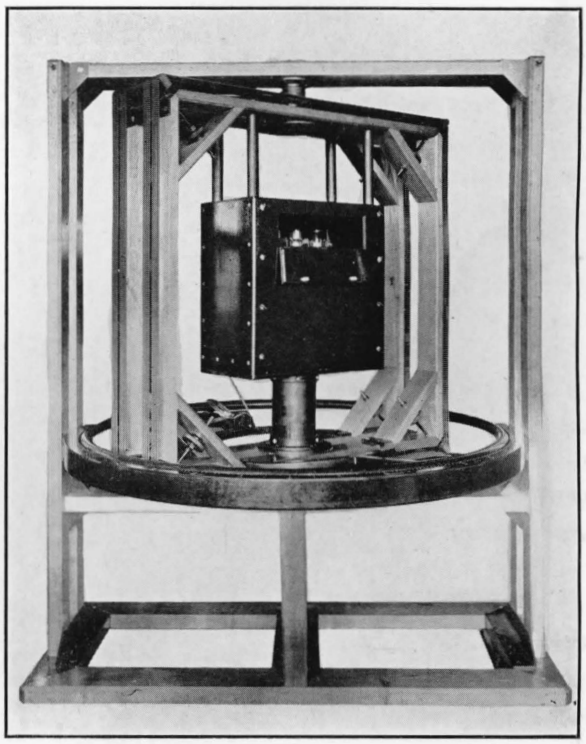
THE problem of devising a radio receiver, which, quite unlike the ordinary receiver, is able to *choose* the direction from which it will receive signals, has long occupied the attention of radio investigators and inventors the world over.

Such a receiver, they believed, would enable them to accomplish some startling and indeed very useful feats, hitherto entirely impossible, such for instance as, a great diminution of interference, the exact location of transmitting stations, or the determination of one's own position with respect to other transmitting stations.

The solution of this problem, in a truly practicable form, was brought about under the stress of urgent necessity during the war, and the first commercial application here pictured as the Simon Radio Direction Finder, meets all of the aspirations of early inventors, and more. With this direction finder, or radio compass, as it is sometimes termed, two or more fixed stations can locate exactly any other radio transmitter within their range of



Radio Direction Finder
Front View

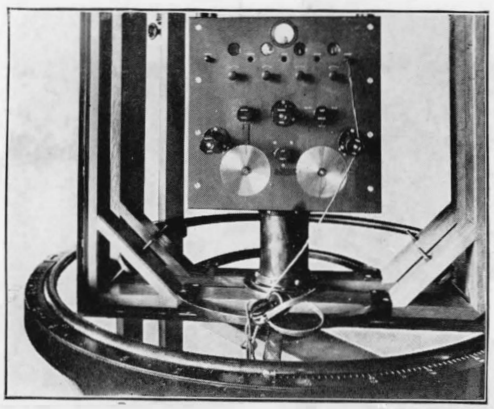


Radio Direction Finder, Showing Rear of
Receiver Cabinet

hearing; or a ship can determine its position anywhere in midocean by radio alone; or a receiving station can operate without interference in close proximity to powerful transmitters; it can even continue to operate under atmospheric static conditions where the ordinary type of receiver would be absolutely inoperative, so effective is it as a "static" eliminator.

This, the latest of the Simon Radio products, is the first commercial radio direction finder. It is thoroughly complete as a self-contained unit, has a range of operation equal to that of the best of ordinary receivers with an antenna 200 feet high, is capable of use as a non-, bi-, and uni-directional receiver, it dispenses entirely with the necessity of elevated aerials, and is accurate to plus or minus one-half of one degree.

This receiver is very ruggedly constructed and is suitable either for land or marine use.



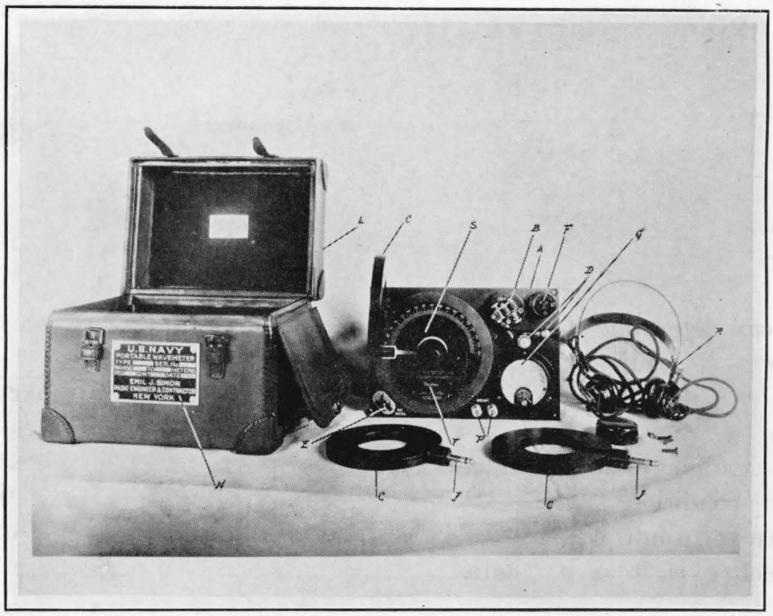
Radio Direction Finder:
View of Receiving Cabinet

Wave Meter

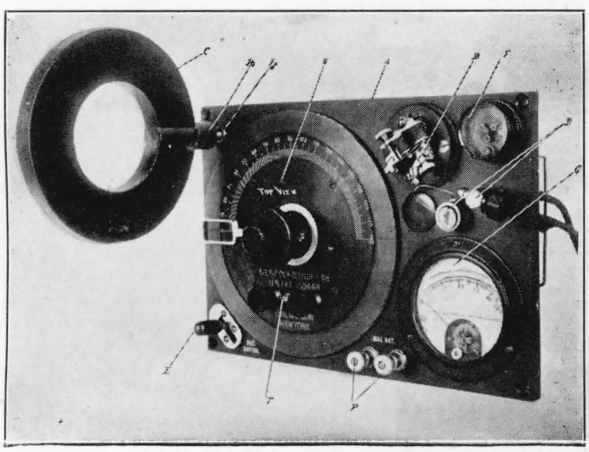
THIS wave meter, of which over 100 have been supplied to the U. S. Government alone, represents not only the most advanced ideas in the technique and exactness of radio measurements, but also a very high order of perfection in design, workmanship and dependability. While its total weight is only seven pounds, it is constructed so ruggedly that it will withstand, without injury to itself or its accurate calibration, all of the treatment that may be expected for an instrument of this nature. It is entirely self-contained, highly portable, and is provided with all the appurtenances necessary for the usual radio measurements.

The wave length range is from 70 to 2,500 meters, these values being obtained with a Seibt variable air condenser of .0016 microfarads maximum capacity and four exploring coil inductances varying from 8 to 1,050 microhenries. These inductance coils are very compact, removable units provided with plug switch connection. They possess a very small distributed capacity and low resistance and therefore permit of very exact measurements. These, when not in use, are stored together with the head receivers, in an inner compartment of the case provided with a removable flap cover. Either a detector and telephone or the thermo current-squared meter may be used as a high frequency translating device for observing resonance effects, or making measurements.

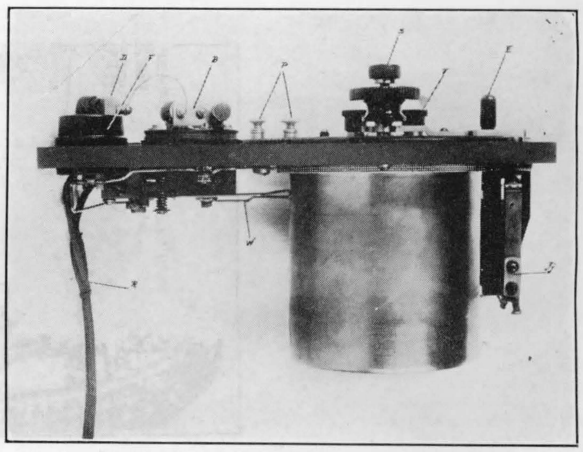
The instrument is accompanied by a very complete instruction book and with calibration curves of wave length, capacity and inductance.



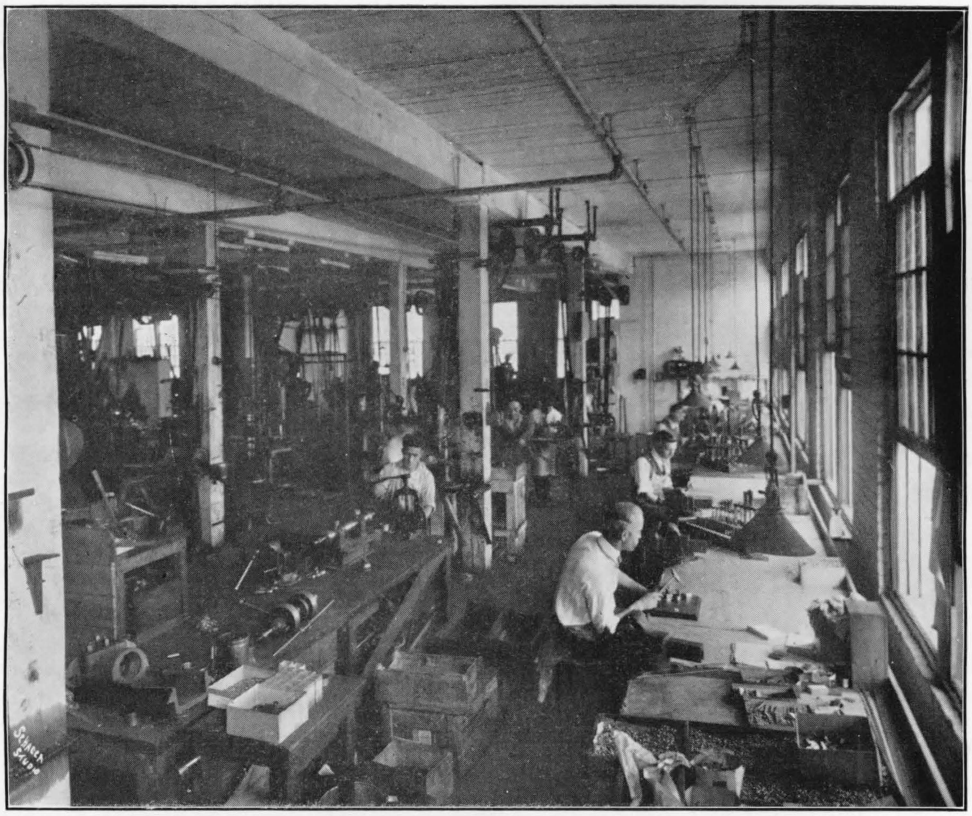
WAVE METER AS REMOVED FROM CASE

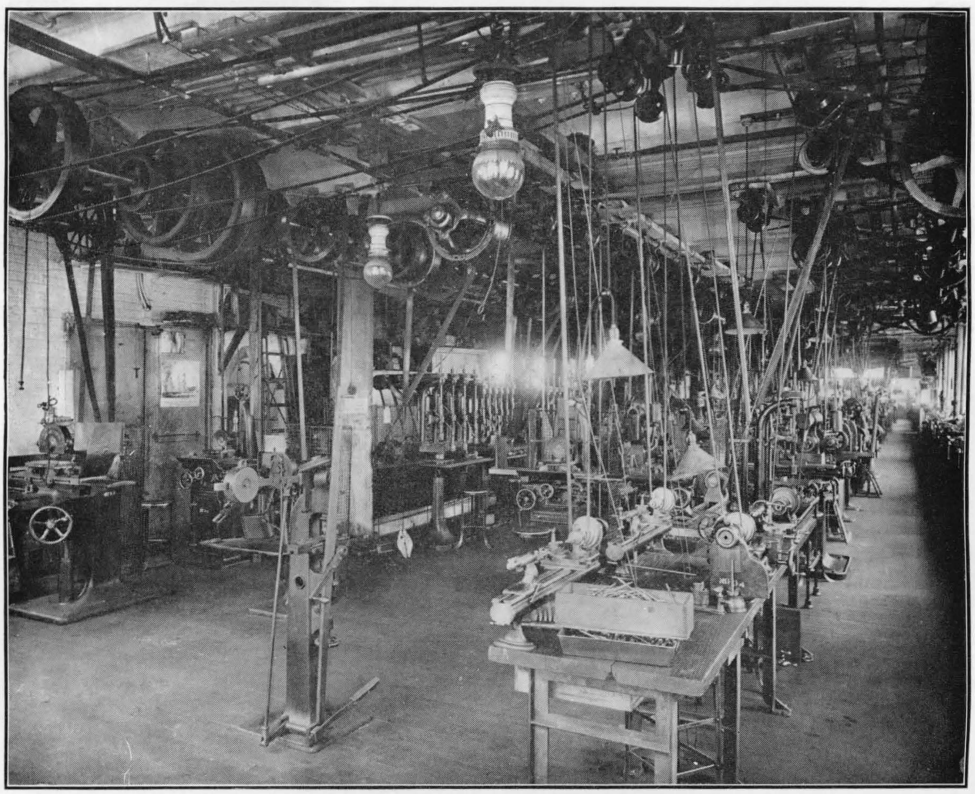


WAVE METER, NAVY TYPE

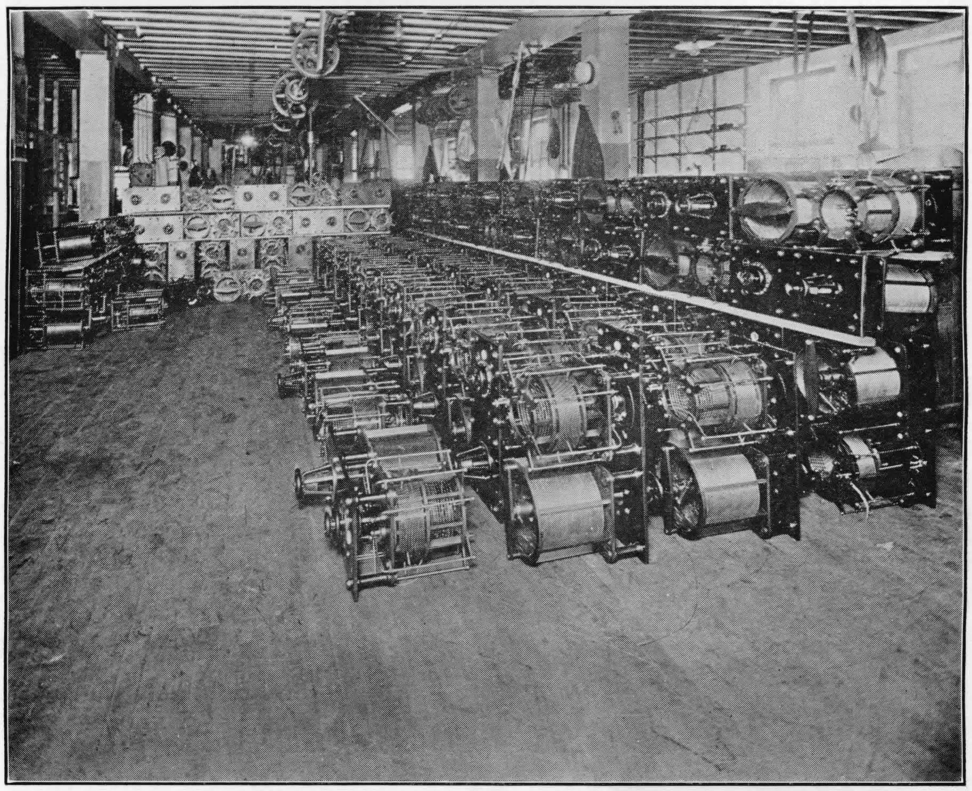


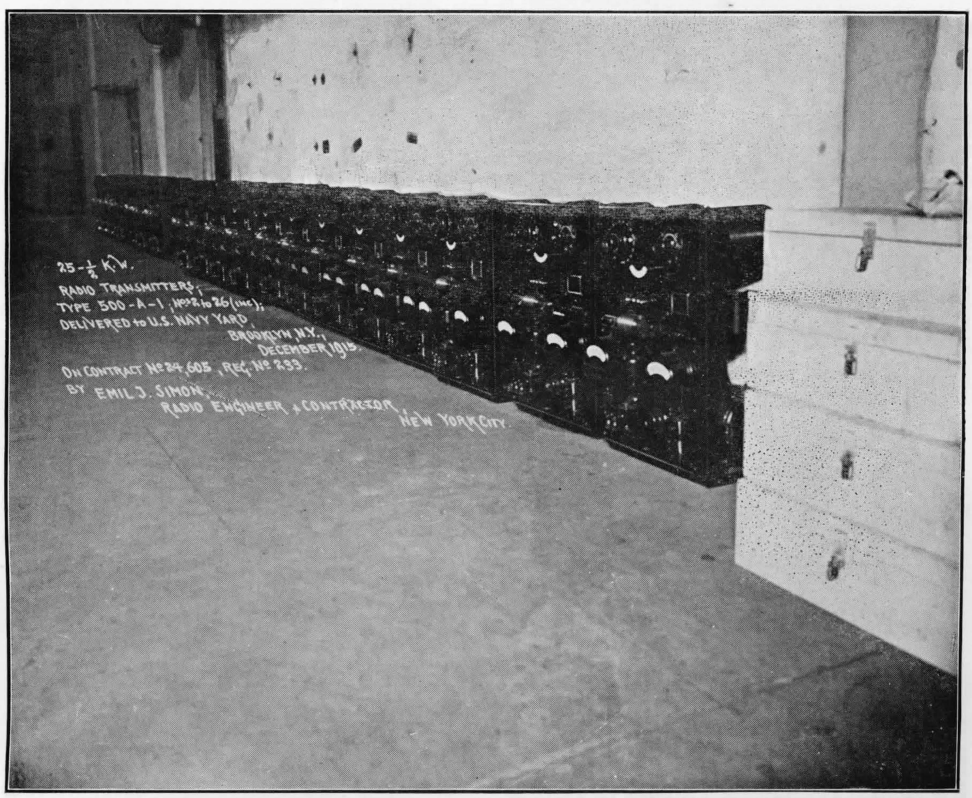
SIDE INTERNAL VIEW WAVE METER





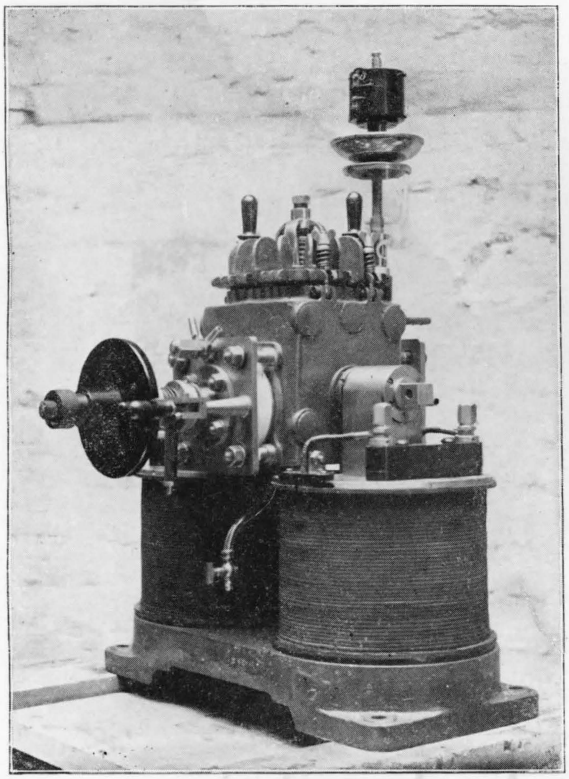
WHERE SIMON RADIO APPARATUS IS MANUFACTURED





A Few of the Simon Marine Transmitters that Helped Win the War

Elwell Arc Transmitters



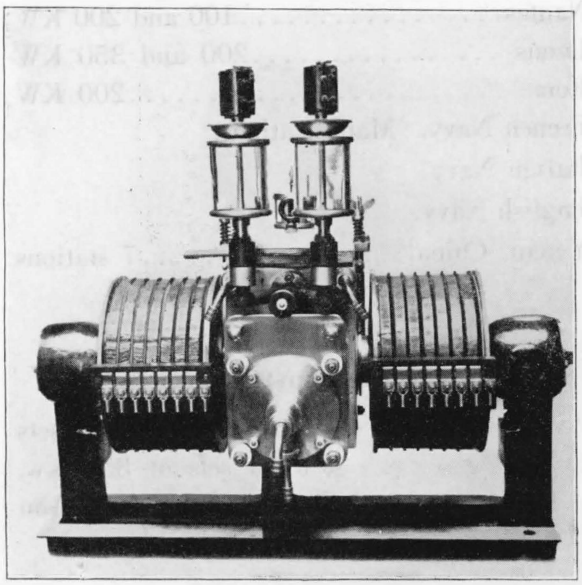
5 and 10 Kw. Arc Converter

Through negotiations recently terminated abroad we have secured the exclusive manufacturing and sales rights for the United States of the well known Elwell developments of the Poulsen Arc Transmitter.

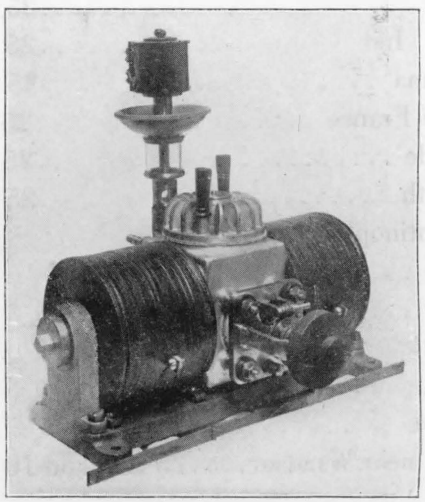
The Elwell Arc Transmitters have been adopted and extensively used by the British, French and Italian Governments. The Imperial Radio Chain of Great Britain, which is to link England with her colonies, will consist of high power Elwell arc stations, and will eventually extend around the world.

These arc converters, of which several sizes are shown in the accompanying cuts, have been built in powers ranging from 2 Kw. to 500 Kw. and we are prepared to manufacture and supply them in all sizes.

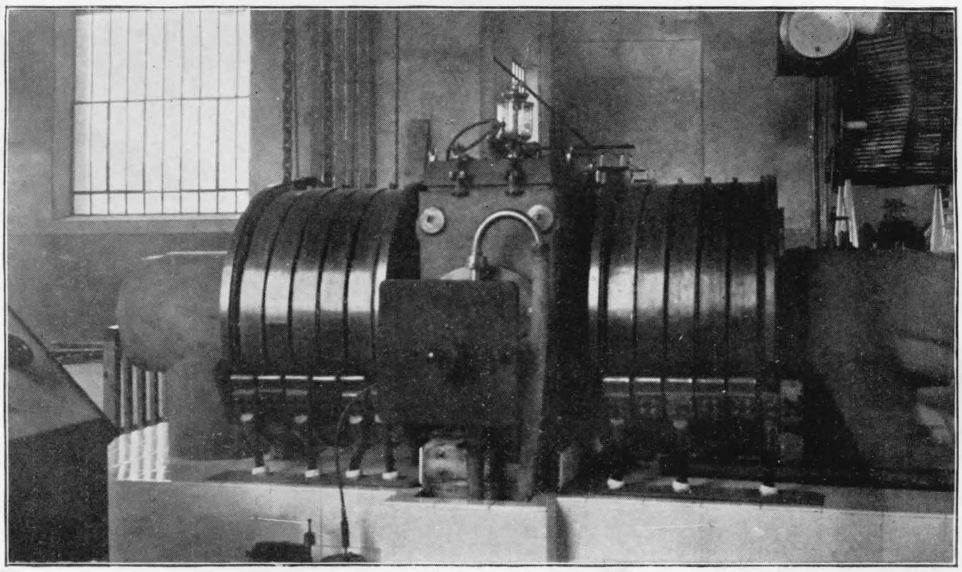
Special litereature concerning this equipment will be furnished on request.



25 Kw. Arc Converter, Complete From Anode End



2 Kw. Arc Converter



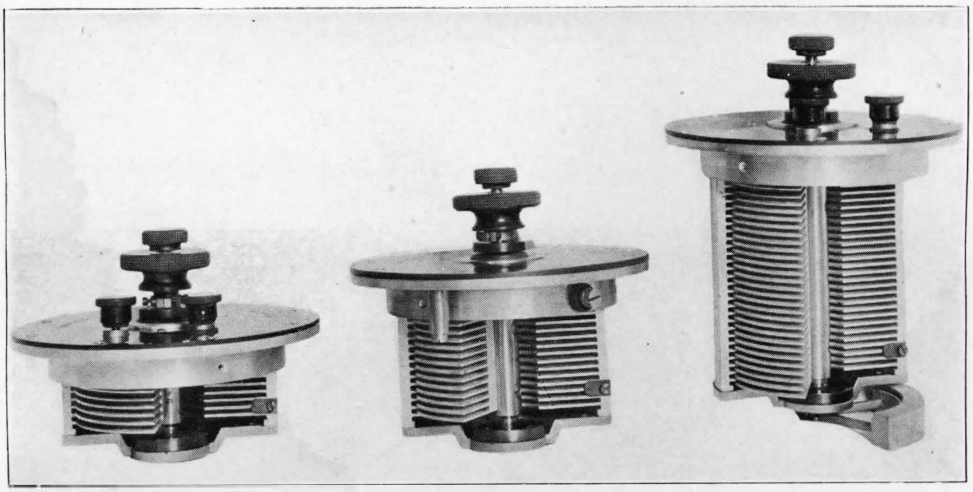
350 Kw. Generator at Lyons, France

Recent Elwell-Poulsen Arc Installations

Algeria, Africa .....25 Kw.
Rufisque, Senegal .....25 Kw.
Salonique .....25 Kw.
Toulon .....25 Kw.
Hanoi. Indo-China .....25 Kw.
Mediouna .....25 Kw.
Fort de France .....25 Kk.
Belgrade .....25 Kw.
Beyrouth .....25 Kw.
Constantinople .....10 Kw.
Corfou .....10 Kw.
Agader .....5 Kw.
Marseilles .....5 Kw.
Toulouse .....5 Kw.
Bordeaux .....5 Kw.
Slough, near Windsor....25 Kw. and 10 Kw.
Eiffel Tower .....150 KW and 5 KW
Nantes.....100 and 200 KW
Lyons .....200 and 350 KW
Rome .....200 KW
French Navy. Many stations.
Italian Navy.
English Navy.
Yunan, China.....7 stations

Under Construction

Brazzaville, Congo .....200 Kw. Two sets
British Imperial Chain—4 sets of 350 Kw. Two for Leafield, Oxford, and two for Abu Abal, Egypt.



SEIBT CONDENSERS WITH CASINGS REMOVED

Seibt Precision Variable Receiving Condensers

The Seibt precision variable receiving condensers in which both the fixed and movable sets of plates are made each in a single piece, possess numerous mechanical and electrical advantages which make them the highest class variable condensers in the world.

The chief advantages of this design are:

1. *Absolute rigidity of plates*, which prevents their bending and touching and maintains constant capacity even when subjected to severe mechanical shocks.

2. *Extraordinary Compactness*, is shown by the size of the largest type shown in the accompanying illustrations. Its maximum capacity is .0024 mfd. and its over-all dimensions are 4 by 4 inches. Its weight is 1.5 pounds.

3. *Capacity Range.* The very great capacity range is well illustrated by the .0024 mfd. size in which the minimum capacity is only about .00002 mfd.

4. *High Insulation Resistance* is provided by the air dielectric and the ample bearing insulations.

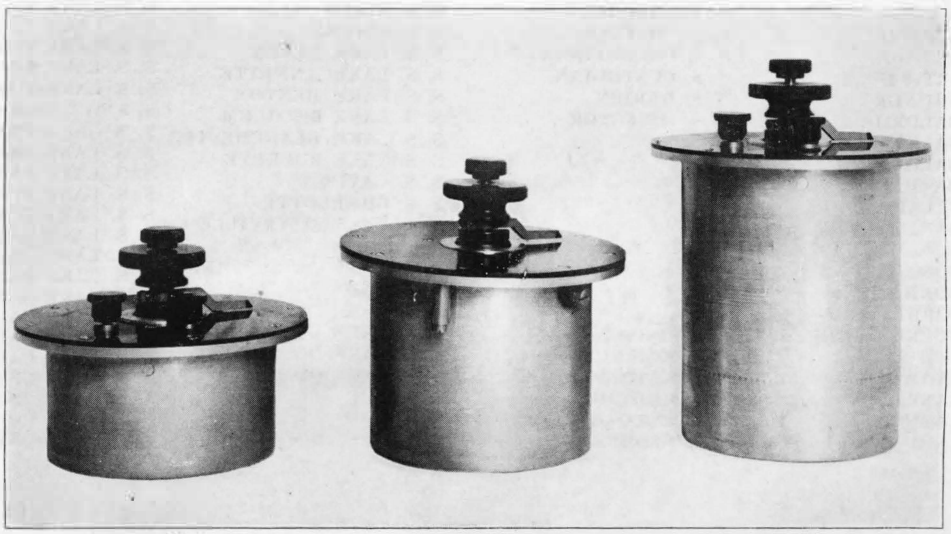
5. *High Disruptive Strength between Plates* is obtained by the same effect noticed in quenched spark gaps.

6. *Low Effective Resistance.* The effective resistance of these condensers is fully 20 per cent lower than that of other commercial variable condensers.

These condensers have been used by nearly all of the European Governments and many wireless companies and are considered unequalled by radio engineers and experts the world over.

They are protected by the following patents:
U. S., No. 1,155,448 France, No. 436,855
Canada, No. 146,137 British, 26,709, of 1910

We are the exclusive licensee for the United States and we are prepared to supply them in four sizes, namely .0006 mfd., .0012 mfd., .0024 mfd., and .005 mfd.



.0006 MFD. .0012 MFD. .0024 MFD.
SEIBT VARIABLE AIR CONDENSERS

U. S. NAVAL VESSELS EQUIPPED WITH SIMON RADIO SETS

U. S. S. AMPHITRITE
U. S. S. AMPHRIDE
U. S. S. AVOCET
U. S. S. BELLOWS
U. S. S. CARDINAL
U. S. S. CRAFTSMAN
U. S. S. CURLEW
U. S. S. D-2
U. S. S. ESSEX
U. S. S. FALCON
U. S. S. FINCH
U. S. S. FLAMINGO
U. S. S. GOPHER
U. S. S. GREBE
U. S. S. HAWK
U. S. S. HERON
U. S. S. ISLA DE LUZON
U. S. S. MALLARD
U. S. S. N-6
U. S. S. NAMECKI
U. S. S. O-1
U. S. S. O-2
U. S. S. O-3
U. S. S. O-4
U. S. S. O-5
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U. S. S. O-15
U. S. S. ORTOLAN
U. S. S. OSPREY
U. S. S. PELICAN
U. S. S. PENGUIN
U. S. S. PIGEON
U. S. S. QUAIL
U. S. S. R-1
U. S. S. R-2
U. S. S. R-3
U. S. S. R-4
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U. S. S. R-27
U. S. S. RESOLUTE
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U. S. S. S-40
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U. S. S. S. C. NO. 125
U. S. S. S. C. NO. 130
U. S. S. S. C. NO. 131
U. S. S. S. C. NO. 132
U. S. S. S. C. NO. 133
U. S. S. S. C. NO. 134
U. S. S. S. C. NO. 136
U. S. S. S. C. NO. 161
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U. S. S. S. C. NO. 201
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U. S. S. S. C. NO. 203
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U. S. S. S. C. NO. 241
U. S. S. S. C. NO. 247
U. S. S. S. C. NO. 330
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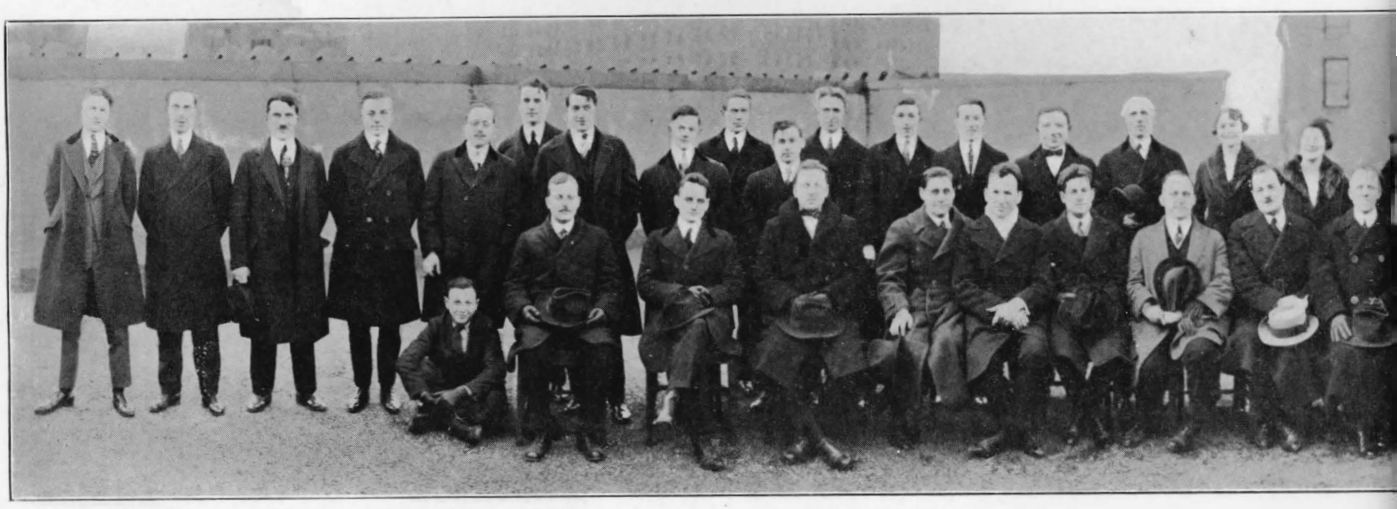
U. S. S. S. C. NO. 423
U. S. S. S. C. NO. 424
U. S. S. S. C. NO. 435
U. S. S. TURKEY
U. S. S. WIDGEON
U. S. S. WOLVERINE
U. S. S. WOOLHAVEN
U. S. LIGHTHOUSE TENDER ARBUTUS
U. S. LIGHTHOUSE TENDER MARIGOLD
U. S. LIGHT VESSEL NO. 23
U. S. LIGHT VESSEL NO. 49
U. S. LIGHT VESSEL NO. 68
U. S. LIGHT VESSEL NO. 69
U. S. LIGHT VESSEL NO. 78

U. S. SHIPPING BOARD VESSELS EQUIPPED WITH SIMON RADIO SETS

S. S. ALIOTH
S. S. ALPAHA
S. S. ALPACO
S. S. ALVADA
S. S. ARTISAN
S. S. ARUNDEL
S. S. BALDRIDGE
S. S. BALESHED
S. S. BALINO
S. S. BATHLUM
S. S. BELAIR
S. S. BEN BROOK
S. S. BIRAN
S. S. BOBOLINK
S. S. BONHAM
S. S. BORETA
S. S. BUCKHANNON
S. S. BUHISAN
S. S. CADMUS
S. S. CANPELLO
S. S. CAYUGA
S. S. CLIO
S. S. CORAPEAK
S. S. CORCORAN
S. S. CORNING
S. S. CORNUCOPIA
S. S. CUSTODIAN
S. S. DARIEN
S. S. DIRECTOR
S. S. EIDER
S. S. EXPLORER
S. S. FLAGG, G.A.
S. S. GARIBALDI
S. S. GUARDSMAN
S. S. HUKEY
S. S. HULVER
S. S. HUMACONNA
S. S. HUMRICK
S. S. JOBSHAVEN
S. S. KAIERUNA
S. S. KATONA
S. S. KEHUHU
S. S. KEKOSHEE
S. S. KESHENA
S. S. KIOKEE
S. S. KIREN
S. S. KITCHI
S. S. LAKE ALLEN
S. S. LAKE ANNETTE
S. S. LAKE BENTON
S. S. LAKE BETHLUM
S. S. LAKE BLANCHESTER
S. S. LAKE BUCKEYE
S. S. CAYUGA
S. S. CHARLOTTE
S. S. CHARLOTTEVILLE
S. S. LAKE CHELAN
S. S. LAKE CLEVENTINE
S. S. LAKE CONWAY
S. S. LAKE CORSICANA
S. S. LAKE CRYSTAL
S. S. LAKE DUANE
S. S. LAKE DUNCAN
S. S. LAKE EDON
S. S. LAKE ENNIS
S. S. LAKE FELICITY
S. S. LAKE FERNWOOD
S. S. LAKE FISCUS
S. S. LAKE FISHER
S. S. LAKE FLOVILLA
S. S. LAKE FONDULAC
S. S. LAKE FORKVILLE
S. S. LAKE FRAZER
S. S. LAKE FRECKS
S. S. LAKE FREEBORN
S. S. LAKE FROHNA
S. S. LAKE FUGARD
S. S. LAKE FURLEY
S. S. LAKE GADSDEN
S. S. LAKE GAILLARD
S. S. LAKE GAITHER
S. S. LAKE GALATA
S. S. LAKE GALEWOOD
S. S. LAKE GALIEN
S. S. LAKE GAZETTE
S. S. LAKE GEBHART
S. S. LAKE GERT
S. S. LAKE GETAWAY
S. S. LAKE GEYSER

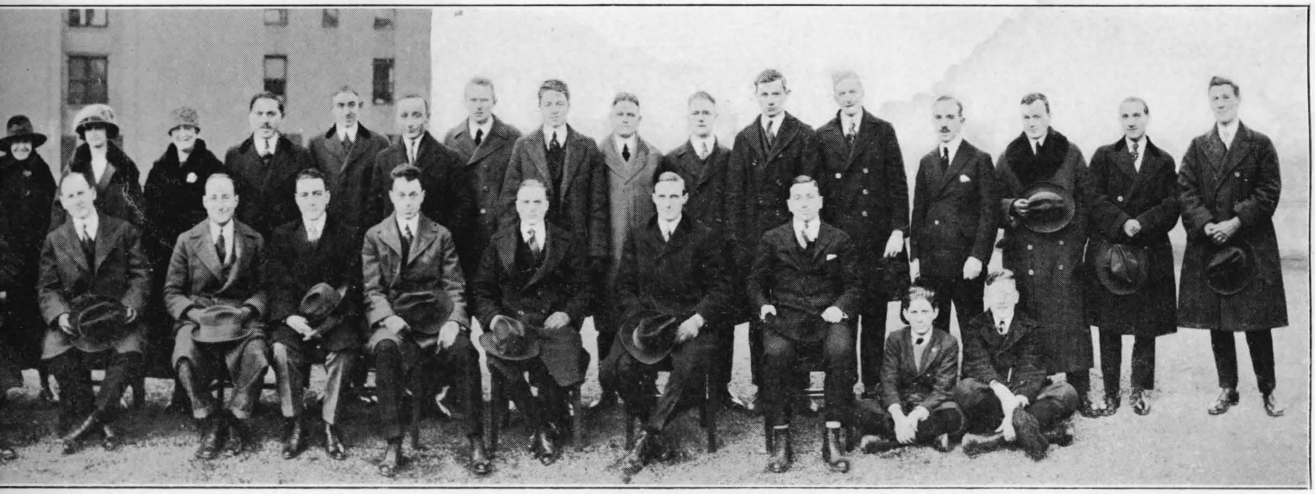


THE SIMO

U.S. SHIPPING BOARD VESSELS EQUIPPED WITH SIMON RADIO SETS—*Cont.*

S. S. LAKE GIDDINGS
S. S. LAKE GRAINGER
S. S. LAKE GRAMA
S. S. LAKE GRAMPLAN
S. S. LAKE GRAMPUS
S. S. LAKE GRANBY
S. S. LAKE GRAVITY
S. S. LAKE GREENBRIER
S. S. LAKE GRETNA
S. S. LAKE GROGAN
S. S. LAKE HARNEY
S. S. LAKE HARRIS
S. S. LAKE HEMLOCK
S. S. LAKE HURST
S. S. LAKE JUGARD
S. S. LAKE KYTTLE
S. S. LAKE LARGA
S. S. LAKE LASANG
S. S. LAKE LEDAN
S. S. LAKE LEMANDO
S. S. LAKE LIDO
S. S. LAKE LILLIAN
S. S. LAKE MARKHAM
S. S. LAKE MONROE
S. S. LAKE ONAWA
S. S. LAKE OTISCO
S. S. LAKE PORTAGE
S. S. LAKE PYTHON
S. S. LAKE SAVUS
S. S. LAKE SEBAGO
S. S. LAKE SHAWANO
S. S. LAKE STERLING
S. S. LAKE SULCARE
S. S. LAKE WASHBURN
S. S. LAKE WEIR
S. S. LAKE WILSON
S. S. LAPWING
S. S. LARK
S. S. LYELIE
S. S. MANKATO
S. S. MARUBA
S. S. MENOMINEE
S. S. MOOSITANKA
S. S. NORTH PINES
S. S. OWL
S. S. OYAKA
S. S. POPE, E.C.
S. S. PROCYON
S. S. RIJCLIJK
S. S. ROBIN
S. S. ROMULUS
S. S. RYNDUK
S. S. RYNLAND
S. S. SAXON
S. S. SEAGULL
S. S. SENECA
S. S. SILLAMOOK
S. S. SIOUX
S. S. SWALLOW
S. S. SWAMPSCOTT
S. S. SUNFLOWER
S. S. TANAGER
S. S. TEAL
S. S. TERN
S. S. THURBAN
S. S. TOILER
S. S. TRAVELLER
S. S. VALLONIA
S. S. VEERHAVEN
S. S. WAALHAVEN
S. S. WARNER, R.F.
S. S. WATCHMAN
S. S. YAYACA
S. S. WEWEANTIC
S. S. WHIPPOORWILL
S. S. WILD GOOSE
S. S. WOODCOCK
S. S. WOODSMAN
S. S. YAWAH
S. S. YSELHAVEN

Over three hundred other vessels of the United States Navy and United States Shipping Boa



TION

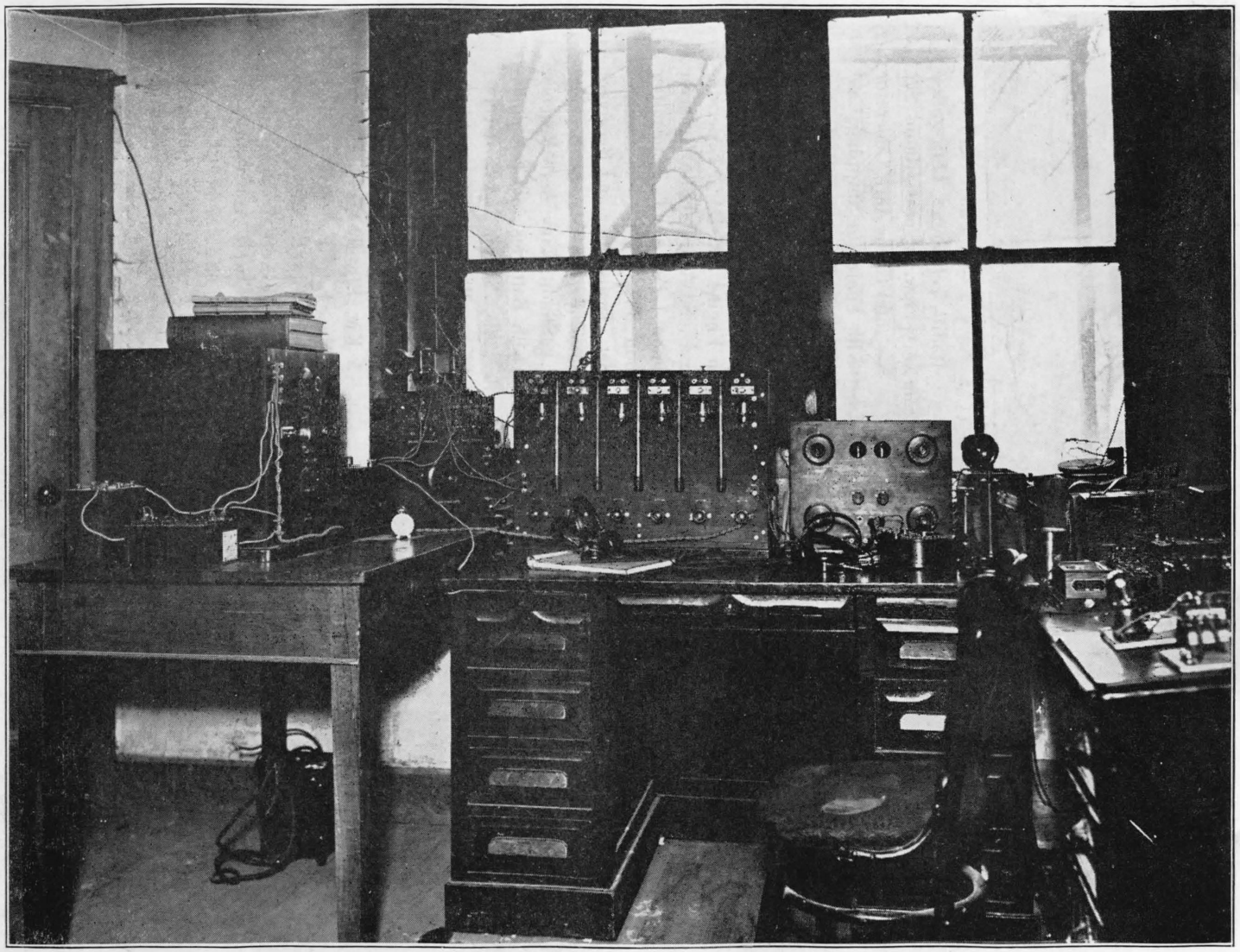
FRENCH GOVERNMENT VESSELS EQUIPPED WITH SIMON RADIO SETS

B. V. ALMA
B. V. ALPACO
B. V. AMERSTAEDT
B. V. ARCOLE
B. V. AUSTERLITZ
B. V. BASSANO
B. V. BAUTEN
B. V. BERWIND
B. V. BOUVINES
B. V. CADMUS
B. V. CAPE ANN
B. V. CASTIGLIONE
B. V. CAUCHY
B. V. CERISOLES
B. V. DEGO
B. V. DENAIN
B. V. DORIC
B. V. EASTON
B. V. EATON
B. V. ECKMUHL
B. V. ELM CITY
B. V. EMERSON
B. V. ESSLING
B. V. EVANGELINE
B. V. FLEURUS
B. V. HENLOPEN
B. V. HONDSHOOTE
B. V. INKERMANN
B. V. IONIAN
B. V. IROQUOIS
B. V. ISLY
B. V. JEMMAPES
B. V. KINGFISHER
B. V. LAGRADE
B. V. LAPLACE
B. V. LENATO
B. V. LENS
B. V. LEOBEN
B. V. LEON MUCT
B. V. LES DUNES
B. V. LES PYRAMIDI
B. V. LODI
B. V. LUTZEN
B. V. MAC SINN
B. V. MAGENTO
B. V. MALAKOFF
B. V. MANTOUE
B. V. MARENGO
B. V. MARIGNAN
B. V. MINCIO
B. V. MAYWOOD
B. V. MONDOVI
B. V. MONTEBELLO
B. V. MONTENOTTE
B. V. NAVARIN
B. V. OLCUTT
B. V. PALESTRO
B. V. PONCELET
B. V. POINSOT
B. V. PORTE RS
B. V. PRESIDENT MENOCAO
B. V. RACINE
B. V. RICHARDS
B. V. ROCROI
B. V. ROHENLINDEN
B. V. SAINT GEORGES
B. V. SAMBRE-ET-MEUSE
B. V. SEBASTOPAL
B. V. SENEF
B. V. SOFERINO
B. V. STEINKERQUE
B. V. SUSQUEHANNA
B. V. TAGLIAMENTO
B. V. TILSITT
B. V. UNITED SHORES
B. V. VALMY
B. V. WATTIGNIES
B. V. WILMOT
B. V. ZURICK

which are at present unavailable, are equipped with Simon Marine Transmitters.

Code Words for Simon Radio Apparatus

SUDASEMOS.....Simon U. S. Navy ½ Kw. Panel Radio Set
SUDATION.....Simon U. S. Navy 1 Kw. Panel Radio Set
SUDATORY.....Simon U. S. Navy 2 Kw. Panel Radio Set
SUDDENLY.....Aircraft Radio Telephone Transmitter
SUDDETTO.....Complete Simon ½ Kw. Aircraft Radio Set
SUDDITA.....Simon ½ Kw. 500 Cycle Aero Generator
SUDEMOS.....Complete Aero Set with Spares in Shipping Case
SUDESTES.....Light Weight ½ Kw. Aero Radio Set
SUDHAUS.....900 Cycle ½ Kw. Aero Generator
SUDOR.....Lightweight Aero Set with Engine Driven Generator
SUDORES.....Simon Independent Power Plant 1 Kw. Set
SUDOROSCO.....Internal Combustion Engine and D. C. Generator
SUDOROUS.....Simon U. S. Army Radio Receiver
SUDRAKER.....Simon 1 Kw. NIC Transmitter
SUDSALZ.....Simon 5 Kw. NIC Transmitter
SUECAS.....Simon U. S. Army S. C. R. 112 Loop Set (Transmitter and Receiver)
SUEDOST.....Simon French Marine Receiver
SUEDPOL.....Simon Navy Aero Receiver
SUEGRA.....Aero Receiver Complete with Batteries and Telephones
SUELAN.....Simon NIC Receiver
SUELDO.....Simon Radio Direction Finder
SUELLOS.....Simon Wave Meter
SUENDE.....Ship Emergency Set, similar to SCR 112
SUERFELN.....2 Kw. Elwell Arc Transmitter
SUESBAST.....5 Kw. Elwell Arc Transmitter
SUFFIRE.....10 Kw. Elwell Arc Transmitter
SUFFIT.....25 Kw. Elwell Arc Transmitter
SUFFIX.....100 Kw. Elwell Arc Transmitter
SUFLATE.....350 Kw. Elwell Arc Transmitter
DRYMODES.....0006 mfd. Seibt Condenser
DUQUEZINHO.....0012 mfd. Seibt Condenser
DURAMADRE.....0024 mfd. Seibt Condenser
DURAVAMO.....005 mfd. Seibt Condenser



EXPERIMENTAL TRANSOCEANIC LOOP RECEIVING STATION

TECHNICAL ART ADVERTISING Co.
LONG ISLAND CITY.