



The GREBE RADIO Story

by G. J. Gray, W8JDV

Remember the Grebe ads in QST in the early 1920s ? The ads featured the venerable and wise Chinese gentlemen Dr. Mu, explaining why we should buy Grebe equipment. Grebe craftsmanship, pointed out by Dr. Mu, was evidenced by solid, quartersawed, stained oak cabinets, satin finished bakelite panels, polished moulded dials, rigid bus wiring; all expertly assembled to produce a high quality radio receiver.

Alfred H. Grebe was born at Richmond Hill, Long Island in 1895. He later established a modern radio plant at the site of his birth. Like a lot of us, he started "tinkering" with radio at an early age. At 14, he built a small workshop in his mother's backyard and started building exceptionally good loose couplers for his experimenter friends. Thus, in 1909 a small business was started which was destined to have a great impact on the radio field.

In 1911, about the time Grebe's contemporaries started to college, he chose the romantic life of a sea-going wireless operator, touring the seas as "sparks" for three years. The Orient held a special interest for him and may account for his Dr. Mu ads in later years. His experiences as a wireless operator with crude commercial spark equipment of the time gave him practical knowledge of what it took to transmit under all conditions.

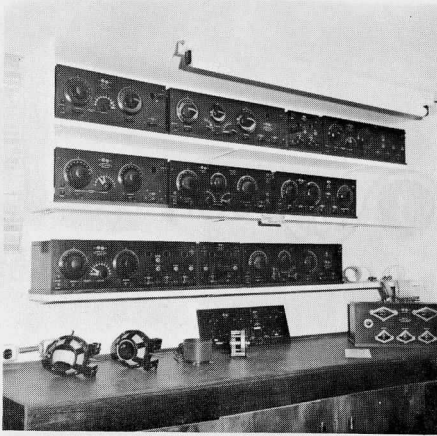
Late in 1914, Grebe served as Chief Wireless Operator on the S.S. Satanta, call GTG, a tanker under British registry. Ralph Barber, W2ZM, Executive Secretary of QCWA, was 2nd operator. After a 9 month trip around the world, Grebe and Barber resigned at San Francisco and came back to New York by



ABOUT THE AUTHOR: Jack Gray, W8JDV, is unquestionably the country's foremost Grebe Historian. Unlike most collectors and historians, he decided to specialize and selected Grebe as his subject.

W8JDV is an old timer having started in the game well before WWI. Originally a Marconi commercial operator in South American and European waters, he finally settled down and after formal education landed with the Crosley Corporation with whom he has been with almost 40 years. Formerly on the WLW staff, he has for the past 19 years been an Engineer at their super high power "Voice of America" installation. An old time "ham" (x-8ARP) he can be heard regularly on SSB and is active in the QCWA and OOTC as well as being an Official Historian for the Antique Wireless Association....

train. The ship was later sunk in the Indian Ocean by a German Submarine and all hands were lost.



Part of the Gray Collection of Grebe Receivers.

When he came back home he found a change had taken place. Three years earlier few knew or cared about radio. Now, he found people interested in the fast growing science. Friends asked him to build receivers and amateurs asked for help with their transmitters. Grebe did not have a college degree but had a natural talent in the design and construction of radio equipment. With his talents so much in demand, he started building equipment for sale and issued a small catalogue. As the market for high quality radio gear increased the Grebe plant grew until it housed facilities for producing 10,000 receivers in 1926.

During the summer of 1916, Grebe had a contract with E.J. Simon & Co. to install Radio Detection gear on French Anti-Sub boats. Grebe and Barber installed the gear at Anacostia Naval Base.

Grebe built receivers with the letters AGP before the model number. The letters stood for Armstrong-Grebe-Pacent: Edwin Armstrong for his regeneration, Grebe the manufacturer, and Pacent of Manhattan Electric Supply for idea and merchandising the line. Pacent marketed the receivers through his company under the name "Mesco". The AGP 101 sold for \$32.50 in 1916. John Di Blasi, W2FX, now president of QCWA was manager of Manhattan Electric Supply.

In 1917, The Grebe Company designed and built special receivers for use on US Navy Sub Chasers with dials radium coated for visibility when sailing without lights to prevent de-

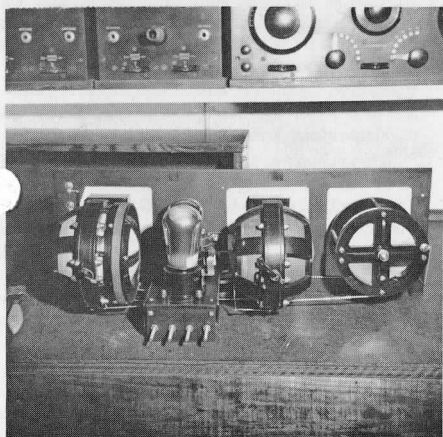
tection by enemy ships.

Grebe had built the now historical loose coupler to function with the crystal detector. Later, the vacuum tube replaced the crystal and variocouplers replaced the loose couplers. Variometers were added to tune the grid and gave smooth regeneration control in the plate circuit. Every part of the Grebe receiver was designed and built to high standards of quality.

Here, the principle of doing small things well to accomplish great things went into practice. Metal sheets and rods became carefully made condensers and small metal fittings. Finely powdered bakelite dust, moulded under great pressure and heat, became solidly built variometer frames, sockets, condenser frames and dials. Electrochemical processes and skilled forming turned aluminum into satin smooth parts. Everything was built in the Grebe plant with high engineering standards and talented workers to produce the finest in receivers. These receivers were an inspiration from a brilliant mind associated with many of the foremost inventors of the time.

To the Grebe plant came Stewart Ballentine, John Hogan, Major Armstrong, Dr. Ben Lieberwitz and others to make their contributions to a truly fine product. Alfred Grebe was a tireless experimenter who was responsible for many advances in radio design. If an idea occurred to him at 4 o'clock in the afternoon, the engineering staff would stay up all night until the "breadboard" model was constructed and some results were obtained. The experiment was continued until a complete receiver with all refinements and wonderful workmanship was built.

Bill Diehl, then Chief Engineer, recalls how at 5 o'clock in the afternoon, having finished work in the lab, he would check the production line and find 20 or 25 different receivers ready to be tested. He would spend the evening testing these receivers by hooking them up and listening to signals. He would tune the band checking for dead spots and testing the sensitivity on signals from California, New Zealand, Australia, Rome, Bordeaux and other DX stations. His first lab equipment was a wavemeter made with Seibt condenser, coils and a hot wire galvanometer. (Grebe's secretary at that time, now Mrs. Wm. Diehl, tells how Major Arm-



Rear view of a CR-13

strong came in one day dressed in old clothes and she sent him to the employment office for a job !)

In 1919 the famous CR series started with the CR-1, 1 tube shortwave regenerative receiver. Wavelength range was 170 to 680 meters. No one talked in terms of kilocycles then. The CR-1 had a rotary coupler with unit tapped switches for the primary, two variometers, one in the grid circuit and the other in the plate circuit, a vacuum tube socket mounted in the panel, a filament rheostat and the necessary binding posts and connections. UV-200, WEVT-1 and audiotrons were used for detection. There was provided a small fixed condenser to increase the normal wavelength of 170 to 375 meters to a range of 280 to 680 meters. The change was made by switching the condenser into the circuit. Maximum regenerative action was obtained with the plate circuit variometer producing resonance between the plate and grid circuits. The VT socket was made of seamless brass tubing, finished in satin nickel and held in a recess at the rear of the panel by means of a bracket. The 1919 CR-1 sold for \$100. This and all subsequent Grebe receivers were licensed under the Armstrong and Marconi patents.

The other Grebe receivers of that year were all based on the CR-1 design. The CR-2 was a tuner only, without detector socket and one tap switch on the primary inductance. There was no filament rheostat. The CR-3 was a special relay man's receiver and had a range of 150 to 680 meters. The CR-4 was built upright and had a variable series condenser in the antenna circuit.

Other, more elaborate receivers, the CR-6 and CR-7 were also in the line. The CR-6, covering a range of 170 to 680 meters, had the basic CR-1 circuit with an antenna series condenser and another variable shunt condenser across the phone circuit for smoother regeneration control.

The CR-7 was a longwave receiver covering the range from 500 to 20,000 meters. This was an elaborate receiver with a 12" x 21" panel, a detector tube socket mounted on the panel, an antenna series variable condenser, a secondary variable condenser, efficient banked litz-wound windings in two, four and six banks to obtain the proper coupling and inductance values. For wavelengths above 2200 meters, special concentrated inductances were used. Regeneration was secured by use of a tickler coil in the plate circuit in inductive relationship to the grid circuit. The 1920 catalog said, "Evenings may be spent listening to high power long wave stations in France, Germany, Italy, Britain, Japan and even Russia." Crystal detectors, tube detectors, one and two stage audio amplifiers, unit variometers, unit condensers, fixed condensers and rotary synchronous spark gaps were listed in the catalog.

The Grebe Company developed and held patents on automatic filament control, moulded bakelite variometers, rheostats calibrated in ohms, tangent wheel verniers, tapered grip dials and unit form of shielding. The automatic filament control gave the operator instant control of detector circuit, detector and one stage or detector and two stages of amplification. The plug energized only the filaments of the tubes in actual use.

The line in 1923 incorporated all these improvements, The CR-8 selling for \$135 replaced the CR-1, but the circuit was the basic variocoupler and two variometers with refinements to extend the range. This receiver, tuning the range from 150 to 1000 meters, was an instrument to brighten the life of any relay man. The CR-5, the first single circuit receiver with a range of 150 to 3000 meters and two dial control, was designed for the man who wanted simple control and wide range. It was tuned by an antenna series condenser and a ten section, triple bank wound inductance in series with the stator winding of a variometer. The rotor was in the plate circuit to provide smooth regeneration control. The CR-9 added a two stage amplifier to the CR-5 circuit.

The first tuned radio frequency amplifier on the market was a Grebe

RORN which provided excellent signal strength with only a small loop or short wire pickup. A vacuum tube with a tuned circuit was coupled to a standard regenerative receiver. Trouble developed due to RF feedback but by utilizing proper values of gridleak and input capacitor combinations, Grebe was able to get adequate gain over the simple regenerative circuit.

Amateur exploration into the shorter wavelengths was recognized in the CR-13 design which tuned down to 80 meters and incorporated tuned radio frequency amplification with regeneration in the detector plate circuit. The CR-12 and CR-14 were broadcast receivers with a range of 200 to 600 meters and housed in beautiful walnut cabinets.

The CR-18 was the last of an illustrious line designed especially for the amateur. Following the trend to shorter wavelengths and efficient low loss coils, the CR-18 had plug-in coils, regeneration, one stage audio with horizontal dials projecting through gold escutcheon plates on the panel.

Grebe equipment went to the South Pole on Byrd's first expedition. Two of the early broadcast stations, WBOQ and WAHG were built and operated by Grebe. WAHG later merged into WABC. The first marine broadcast station WRMU, which was used to broadcast yacht races and other marine events, was installed on MU-1, the yacht of Douglas Rigney, general manager and treasurer of the Grebe Company.

WRMU had two oscillator tubes, two modulator tubes and power of 100 watts. When operated as a relay for WAHG a wavelength of 68 meters was used. For broadcasting direct to listeners, a wavelength of 236 meters was used. A motor generator operating on a 32 volt bank of batteries supplied 1500 volts for the plate

In 1928, Grebe equipped the yacht, Fan Kwai, with a transmitter for operation between 40 and 130 meters operating on phone and ICW. The receivers were Grebe CR-18 for shortwaves and a Synchrophase 5 for broadcast reception and phograph amplification. A station, manned by Lloyd Jacquet, was installed on the S.S. Aquatania to test ship to shore shortwave communication.

The first mobile transmitter, WGMU, with a power of 100 watts was installed in a car and used to broadcast horse races (much to the disgust of the local bookies !) It was also used for other remote pickups.

Amateur station 2LH was operated by

Al Grebe in 1912 and handled a lot of relay traffic at that time. Experimental station 2PV became 2ZV and in 1916 operated with rotary spark and 500 cycle quenched gap. An arc telephone transmitter with special Grebe receiver made an imposing installation.

Later, experimental station 2XE operated on wavelengths as low as 10 meters and included CR-6 and CR-7 receivers. Ted Ostman, then director of Grebe Service, was 2OM and won the 1922 Hoover Cup for excellence in amateur design and operation. Ted recently became a "Silent Key"; another great amateur has passed on.

A picture of station 2OM taken in 1921 shows a CR-13 and 2 stage amplifier. A husky 1 KW transmitter with Grebe rotary synchronous spark gap and oscillation transformer with a single turn primary made of 3" copper strip was used. A sturdy wavemeter and loop-modulated phone completed the setup. Contrast this solid bulky gear with stream-lined, efficient tabletop gear of today.

In 1926 receivers designed for broadcast use featured the Synchrophase circuit with "binocular" coils designed to prevent interaction between stages. The patent rights on these coils started a lengthy legal action between Grebe and Hazeltine, who however, remained good friends during the legal proceedings.

The Synchrophase MU-1, Synchrophase 5 and 7 were all popular broadcast battery models which later used Grebe "A" and "B" eliminators for AC operation. The last models were self contained AC receivers featuring "Colortone" audio control and single dial control. Rich mahogany and walnut cabinets housed this fine equipment.

Grebe, the perfectionist and practical, self-trained radio engineer was a shy modest man concerned with producing only the very best in radio equipment. He surrounded himself with capable men such as Bill Diehl, Ted Ostman, Douglas Rigney and other brilliant men mentioned earlier in this article. We can only wonder how far the Grebe Company would have gone if there had been no depression in 1929. This economic collapse reduced the market for high quality receivers and the company was liquidated in 1932.

In 1935, Grebe completed his plans for a new company with a line of 1936 receivers. However, Grebe had a serious operation on October 24, 1935. Complications developed and Alfred H. Grebe, W2ZG, became a "Silent Key".

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