

# Spark-Gap Times

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FOR WE HEARS THE BOUNDER A SENDIN', BUT THE BOUNDER HE DON'T HEAR US  
SO WE LAYS THE PHONES ON THE TABLE, AND GIVES UP TO AN IMPORTANT CUSS  
YOU CAN GO WHERE YOU LIKE, ANYWHERE ON THE PIKE,  
BUT YOU CAN'T GET RID OF "DF".

ED G. RASER, W2Z1--WIRELESS SINCE 1908

READ IT FELLERS AND CHUCKLE. THIS IS GOOD ED; OUR THANKS...YE OLDE COPY BOY.

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SEZ W2EG-- EARL

THE FARMER WELCOMED THEIR DAUGHTER BACK FROM HER FIRST YEAR IN COLLEGE. HE GOT UP TO LEAVE AND SAID, "I HAVE GOT TO GO OUT AND SPREAD THE HORSE MANURE"... AFTER HIS LEAVING THE DAUGHTER SAID, "I WISH YOU WOULD SPEAK TO DAD AND HAVE HIM USE THE WORD FERTILIZER". THE MOTHER REPLIED, "I DON'T THINK YOU CAN DO MUCH WITH YOUR DAD. IT TOOK ME TWO YEARS TO HAVE HIM SAY MANURE".

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**CORRECTION OVER DUE**

SINCE RECEIPT OF THE CURRENT ROSTER OF MEMBERS OF THE OLD OLD TIMERS CLUB, WHEREIN THE YEAR OF COMMENCEMENT AS AN AMATEUR IS INDICATED AS 1908, I HAVE BEEN SOMEWHAT EMBARRASSED BY MY FRIENDS WHO UNDERSTOOD THAT I BUILT MY FIRST AMATEUR EQUIPMENT AND OPERATED IT IN 1899. THIS IS THE DATE INDICATED ON MY QSL CARDS AND RECORDED, EVEN IN MY BIOGRAPHY IN THE PUBLICATION WIRELESS PRESS, LTD., PUBLISHED BY THE MARCONI WIRELESS TELEGRAPH Co., IN LONDON, ENGLAND, AT THE TIME I WAS OPERATING THE WANEMAKER-MARCONI WIRELESS TELEGRAPH STATION ATOP THE WANEMAKER STORE IN PHILADELPHIA, PA., IN 1902, AND AGAIN IN WHO'S WHO IN ENGINEERING, BY JOHN WILLIAM LEONARD, PUBLISHED BY WHO'S WHO PUBLICATIONS, INC., IN NEW YORK CITY, 1925.

OF COURSE THE REASON FOR THE 1908 ENTRY IN THE ROSTER IS DUE TO THE FACT THAT THE OLD OLD TIMERS CLUB, UNDER ARTICLE VIII OF ITS CONSTITUTION SHOWING QUALIFICATIONS FOR MEMBERSHIP, REQUIRES THAT THE APPLICANT FOR MEMBERSHIP MADE A TWO WAY CONTACT OVER HIS OWN TRANSMITTER WITH SOME OTHER WIRELESS STATION. IT ALSO REQUIRES THE "DATE OF HIS OR HER FIRST TWO WAY CONTACT BY WIRELESS". THIS INFORMATION I FURNISHED BUT DISTINCTLY STATED THAT WHEREAS MY TWO WAY CONTACTS HAD OCCURRED IN 1908, AND THAT I AM LISTED IN THE FIRST ANNUAL OFFICIAL WIRELESS BLUE BOOK OF THE WIRELESS ASSOCIATION OF AMERICA, PUBLISHED IN MAY, 1909, I DID HOWEVER CONSTRUCT AND OPERATE MY WIRELESS TRANSMITTER AND RECEIVER IN 1899.

IN 1899, I WAS LOCATED IN PHILADELPHIA, PA., AND READ IN THE NEWSPAPERS ABOUT THE INTERNATIONAL YACHT RACES BEING REPORTED FOR THE FIRST TIME BY MARCONI WIRELESS OFF SANDY HOOK, N.Y. THIS AROUSED GREAT INTEREST IN ME TO BE ABLE TO RECEIVE SUCH REPORTS OF THE NEXT YACHT RACE IN 1900. I COMMENCED IMMEDIATELY TO CONSTRUCT PARTS AND ASSEMBLE A TRANSMITTER CONSISTING OF A ONE INCH RHUMKORFF COIL (SPARK COIL), THE PRIMARY OF WHICH I ENERGIZED BY A BATTERY CIRCUIT CONTAINING A TELEGRAPH KEY, AND ACROSS THE SECONDARY TERMINALS I CONNECTED A SPARK GAP CONSISTING OF TWO SMALL BRASS RODS WITH A BALL AT THE END OF EACH ROD, THE BALLS BEING SEPARATED ABOUT A QUARTER INCH APART; THE SPARK OCCURRING BETWEEN THEM WHENEVER THE TELEGRAPH KEY WAS DEPRESSED. TO ONE OF THE TERMINALS OF THE COIL I CONNECTED AN ANTENNA OF ABOUT SEVENTY-FEET IN LENGTH, AND TO THE OTHER TERMINAL I MADE A CONNECTION TO GROUND. THIS IS PRECISELY WHAT MARCONI WAS USING AT THAT TIME; NO OSCILLATION TRANSFORMER OR TUNING

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COIL AND NO CONDENSERS; JUST A PLAIN ANTENNA TO GROUND CIRCUIT BROKEN ONLY BY THE SPARK GAP.

MY RECEIVER WAS ALSO PATTERNED AFTER THAT OF MARCONI AND CONSISTED OF A SILVER-NICKLE FILINGS COHERER WHICH I CONSTRUCTED BY USING A GLASS TUBE ABOUT A QUARTER INCH IN DIAMETER IN WHICH WERE INSERTED TWO SILVER PLUGS SEPERATED ABOUT AN EIGHTH INCH APART AND THE SPACE BETWEEN THEM FILLED WITH A MIXTURE OF SILVER AND NICKLE FILINGS. ONE OF THE PLUGS WAS CONNECTED DIRECTLY TO THE ANTENNA WHICH WAS ALSO ABOUT SEVENTY FIVE FEET LONG, AND THE OTHER PLUG WAS CONNECTED TO GROUND. AGAIN THERE WAS NO TUNING COIL OR CONDENSERS IN THE CIRCUIT, JUST AN ANTENNA TO GROUND THROUGH THE COHERER. ALSO CONNECTED TO THE TWO SILVER PLUGS WAS A LOCAL CIRCUIT CONTAINING A BATTERY OF LOW POTENTIAL, A SENSITIVE RELAY WHICH OPERATED AN ORDINARY ELECTRIC BELL WITH THE GONG REMOVED AND THE HAMMER PLACED CLOSE TO THE GLASS TUBE COHERER TO TAP IT AND SHAKE THE FILINGS APART AFTER THE FIRST SIGNAL HAD COHERED THEM AND PERMITTED CURRENT TO PASS THE RELAY. THUS THE RELAY CIRCUIT WAS OPENED, THE TAPPER STOPPED, AND AND EVERYTHING IN READINESS FOR THE NEXT SIGNAL. THIS ARRANGEMENT ACTUALLY WORKED WHENEVER THE TRANSMITTER WAS OPERATED.

THERE WAS ONE IMPORTANT TROUBLE; THERE WAS NO OTHER STATION IN THAT LOCALITY WITH WHICH TO WORK. THE NEXT AMATEUR (WALTER J. DEERY), WD, A GENERAL ELECTRIC SALESMAN, DID NOT APPEAR UNTIL ALMOST A YEAR LATER, IN 1900. SO, IN ORDER TO WORK MY EQUIPMENT, I LOCATED THE TRANSMITTER AT ONE PLACE AND THE RECEIVER A SHORT DISTANCE AWAY, AND HAD A COLLEAGUE OF MINE, CHARLES WACHTER, ALTERNATELY OPERATE THE TRANSMITTER WHILE I WAS AT THE RECEIVING EQUIPMENT SOME DISTANCE AWAY AND VICE VERSA. IT WAS ACTUALLY A TRANSMISSION BETWEEN TWO STATIONS BUT EACH STATION LACKED EITHER A TRANSMITTER OR A RECEIVER THAT WOULD ENABLE THEM TO WORK BACK AND FORTH.

UNFORTUNATELY, AS RECORDS WILL DISCLOSE, THERE WAS NO INTERNATIONAL YACHT RACE OFF SANDY HOOK IN 1900, SO I NEVER DID RECEIVE THE RESULTS SO EAGERLY SOUGHT.

FINDING THE COHERER RATHER SLUGGISH IN OPERATION AND QUITE UNRELIABLE, I MADE VARIOUS KINDS OF DETECTORS, THE NEXT BEING THE COPPER OXIDE TRIPOD WHICH CONSISTED OF A METAL TRIPOD WITH THE BOTTOM OF IT'S LEGS POINTED STANDING ON A PLATE OF OXIDIZED COPPER; THEN THE CARBON-STEEL DETECTOR WAS TRIED. THE FIRST TYPE BEING TWO SMALL BLOCKS SET UPRIGHT ON A BASE WITH THEIR UPPER EDGES GROUND TO A KNIFE EDGE AND A STEEL NEEDLE, WITH A SMALL WEIGHT SUSPENDED FROM IT'S CENTER TO KEEP IT FROM ROLLING OFF, LAID ACROSS THE CARBON BLOCKS. THIS WAS THE FIRST AUTOMATIC DECOHERING TYPE OF DETECTOR THAT I USED; BUT THE EDGES OF THE CARBON BLOCKS WERE HARD TO MAINTAIN IN A SUFFICIENTLY SHARP CONDITION BECAUSE THE CARBON IS SO BRITTLE. IF I DID THIS TODAY I WOULD USE A COUPLE OF RAZOR BLADES STANDING UPRIGHT, WITH A SMALL ROD OF CARBON ACROSS THEIR EDGES OR PERHAPS USE THE CARBON STRIP FROM A PENCIL.

WITH THE CARBON-STEEL DETECTOR A SINGLE DRY CELL WAS CONNECTED IN SERIES WITH THE CARBON BLOCKS AND A TELEPHONE RECEIVER. THIS WORKED FAIRLY WELL BUT I GOT A BETTER IDEA. PROCURING FROM THE DRUGGIST A SMALL WOODEN PILL BOX (THEY DON'T COME THAT WAY ANYMORE), I INSERTED A SEWING NEEDLE THROUGH EACH SIDE AND KEPT THE POINTS ABOUT ONE QUARTER INCH APART AND THEN FILLED THE BOX WITH CARBON GRANULES FROM A TELEPHONE TRANSMITTER. BOY! OH BOY, HOW NICELY THAT WORKED; ALL THE TROUBLES OF THE OTHER TYPE DISAPPEARED. I HEARD THE NEW NAVAL WIRELESS STATION AT THE PHILADELPHIA NAVY YARD, CALL LETTERS PV AT THAT TIME, AS SOON AS THEY OPENED UP. I CAN'T RECALL THE EXACT YEAR BUT IT MUST HAVE BEEN AROUND 1913.

MY NEXT DETECTOR WAS THE ELECTROLYTIC, THE FIRST ONE I MADE WITH A GLASS EYEDROPPER TUBE. RUNNING A PIECE OF VERY FINE (1/1000") PLATINUM WIRE THROUGH THE TUBE I SEALED IT INTO THE FINE POINTED END WITH A BUNSEN BURNER FLAME AND THEN CAREFULLY GROUND DOWN THE END OF THE TUBE UNTIL IT PRESENTED A SMALL FLAT SURFACE WITH A MINIATURE DOT OF PLATINUM IN THE CENTER. THE SMALL END OF THIS TUBE WAS THEN INSERTED IN A SMALL AMOUNT OF NITRIC (OR SUL-

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FURIC) ACID SOLUTION (ABOUT 10 %) AND CONNECTED IN A CIRCUIT WHICH INCLUDED A POTENTIOMETER FOR ADJUSTING THE POTENTIAL, A BATTERY OF A COUPLE OF VOLTS AND A TELEPHONE RECEIVER. THIS WAS CONNECTED IN THE USUAL MANNER IN THE RECEIVING CIRCUIT AND WORKED QUITE WELL FOR A WHILE BUT HAD THE HABIT OF GETTING RATHER INSENSITIVE AFTER WORKING FOR A DAY OR TWO.

DISCOVERING THAT WOLLASTON WIRE WHICH CONSISTED OF A VERY FINE, ALMOST INVISIBLE, PLATINUM WIRE COATED WITH SILVER TO MAKE IT USABLE, COULD BE OBTAINED FROM BAKER & CO., IN NEWARK, N.J., I OBTAINED A SMALL QUANTITY AND MADE A DETECTOR FROM PARTS OF A TELEGRAPH SOUNDER. USING THE UPRIGHT YOKE MEMBER AND SAWING OFF THE LONG END OF THE ARMATURE, I TAPPED A HOLE IN THE SHORT END AND SCREWED A WIRE HANDLE TO IT SO THAT BY PRESSING DOWN ON THE WIRE HANDLE, THE LONG END OF THE ARMATURE WOULD RISE UPWARD. ON THE LONG END OF THE ARMATURE, I PLACED A SMALL CLIP TO HOLD A SHORT LENGTH (ABOUT 3'8") OF WOLLASTON WIRE. DIRECTLY UNDER THE CLIP, I SUPPORTED A SMALL PLATINUM CUP PARTIALLY FILLED WITH A SOLUTION OF NITRIC ACID INTO WHICH THE WOLLASTON WIRE DIPPED ABOUT 1/64 INCH.

THE NITRIC ACID DISSOLVED THE SILVER FROM THE WOLLASTON WIRE TIP ALLOWING THE FINE PLATINUM WIRE TO CONTACT THE ACID. THE PLATINUM TIP WAS SO FINE THAT I HAVE SEEN IT UNDER A MAGNIFYING GLASS REFUSE TO ENTER THE ACID BUT RATHER TOUCH THE SURFACE AND THEN CURL UPWARD JUST AS THOUGH THE LIQUID WAS A SOLID; THAT'S HOW FINE THE PLATINUM WIRE WAS. THIS ARRANGEMENT ALSO EMPLOYED A BATTERY, A POTENTIOMETER AND A TELEPHONE RECEIVER. (THERE WERE NO WIRELESS HEADPHONES YET AVAILABLE, SO WE USED TELEPHONE RECEIVERS AND INCIDENTALLY, MY FIRST HEAD RECEIVER WAS A SINGLE ONE ON A BAND FOR ONE EAR AS SHOWN IN AN EARLY PHOTOGRAPH OF MY STATION).

THE WOLLASTON WIRE ELECTROLYTIC WORKED VERY WELL WITH THE EXCEPTION THAT YOU HAD TO RAISE THE PLATINUM WIRE FROM THE ACID EVERY YOU TRANSMITTED OR IT WOULD BE BURNED OFF. ALSO A NEARBY STATION OR A BLOB OF STATIC WOULD BURN IT OFF AND YOU HAD TO GO ALL THROUGH THE PROCESS OF DISSOLVING THE SILVER OFF ANOTHER PORTION OF THE WOLLASTON WIRE BEFORE YOU COULD RECEIVE AND THIS TOOK SOME SECONDS. IT WAS, THOUGH, A VERY SENSITIVE DETECTOR AND ONLY OUTDONE BY THE CRYSTALS THAT FOLLOWED.

THE NEXT DETECTORS WERE THE CRYSTALS, CARBORUNDUM, SILICON, IRON PYRITES, PERIKON (CHALCOPYRITE AND ZINCITE), AND FINALLY GALENA, AND CERUSITE. CERUSITE WAS A GRANULAR FORM OF GALENA WHICH APPEARED TO BE MORE SENSITIVE, AT LEAST YOU COULD FIND A GOOD SPOT MUCH EASIER THAN WITH GALENA. I FOUND A SUPPLY OF CERUSITE IN THE LEAD BEARING ORE OF PENNSYLVANIA SOMEWHERE AROUND YORK, AND MY COLLEAGUE AT THAT TIME PROFESSOR LLOYD M. KNOLL OF CENTRAL HIGH SCHOOL, PHILADELPHIA, USED TO MAKE TRIPS UP THERE FOR SUPPLY.

OF COURSE THE DEFOREST AUDION OUTDID THEM ALL, BUT WHEN ARMSTRONG CAME UP WITH HIS REGENERATIVE CIRCUITS, WE THOUGHT THAT WAS THE END OF THEM ALL. HOW THOSE SIGNALS BOOMED IN THAT EARLY MORNING WHEN PROF. KNOLL AND I LEFT NEW YORK CITY ON THAT MIDNIGHT TRAIN AFTER HEARING ARMSTRONG ANNOUNCE HIS REGENERATIVE CIRCUITS AT THE MEETING OF THE I.R.E. AND IMMEDIATELY WIRE UP OUR AUDIONS FOR REGENERATION; IT WAS JUST UNBELIEVABLE.

BUT NOW I AM GETTING UP TO THE TIME WHEN I WENT COMMERCIAL AND BOARDED A STANDARD OIL TANKER AT BAYONNE, N.J. AND HESITENTLY CALLED NY TO GIVE HIM A DEPARTURE REPORT AND HE FLASHED BACK AT ME WITH A LONG MESSAGE FOR THE SKIPPER WHICH, EVEN AFTER MUCH REPHRASING, THE SKIPPER COULD NOT UNDERSTAND. SPARKS HAD A VERY RED FACE THAT TIME.

73 AND 30

TOM W3AX

THANKS FOR THE STORY TOM. IT WAS MOST INTERESTING AND WILL BE ENJOYED. YE OLDE COPY BOY.