

THE PARAGON 2-5-U TRANSMITTER

by Ken Gardner, W2BGN

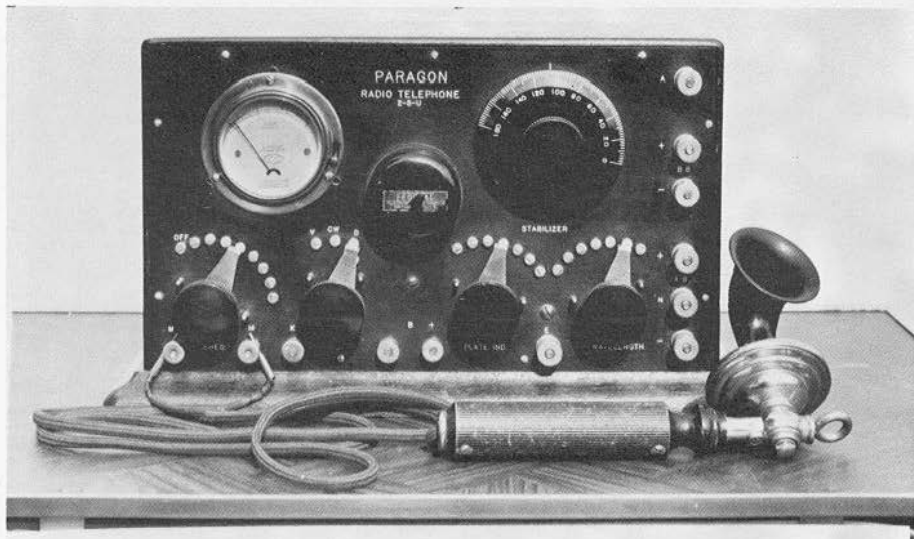


Fig. 1 2-5-U TRANSMITTER IN A.W.A. MUSEUM

Much has been written in the OTB about Ham-built Hartleys, the 1DH, the TNT, the TPTG, etc., but very little about the early commercially-built transmitters. Early Hams were inveterate experimenters and builders so it was only natural that they assembled components--tried the circuit and reassembled the parts into another circuit--and then tore the whole thing down again. What need was there of a beautiful panel and cabinet job which hid the loved inner works from the eye? And it was cheaper that way!

In spite of this inborn pioneering philosophy, a few equally pioneering manufacturers began to test the market for their complete transmitters of various types.

In 1919, DeForest advertised its Type O, 10 watt radiophone as available to Amateurs, and in 1920, Type OT-5 and OT-10. The latter could be used on 110DC or 32 volt DC using dynamotors. Radioland of Jamaica, New York announced a 5 watter.

In 1921, DeForest brought out the Midget OT-3 (5 watts) and the Oscillon (500 watts). Adams-Morgan introduced the Paragon 2-5-U (10 watts fone, CW and ICW). Benwood advertised a 10 watt transmitter. Westinghouse marketed the Model TF, 20 watt CW-- 10 watt fone and General Electric produced the ET3619 a similarly rated rig. These latter two were sold by RCA.

In 1922, Tresco of Davenport, Iowa, built a 5 watter, and in 1923 A. H. Grebe introduced a 10 watt Deluxe CW.

Note that this development of transmitters followed that of vacuum tubes. 1919-1920 war

surplus Western Electric VT2, DeForest V2 and VT21 tubes started the move to undamped waves, and in 1921 RCA UV202, UV203, UV204 and appropriate tube rectifiers provided the big push. Amateur builders, during this same period, experimented with simple 5-watt rigs and those of all sizes up to quite complex 1000 watt fone or CW beauties. With this background, let's consider one unit bearing the famous name Paragon, the 2-5-U Radio Transmitter, from the standpoint of our present knowledge of the art. See picture Figure 1.

Early Hams spent hours pouring over catalogs, appreciating fine cabinets and the "technical" look of a good panel layout. Modern collectors also have this "feel" and so the first job is to refinish the cabinet, polish the panel and metal parts. There is no substitute for stripping the wood, restaining, and applying elbow grease and real wax. Then carefully remove the old engraver filling and refill with a paint stick.

Paragon parts are not very heavily plated and require great cleaning and polishing care. A previous owner of our particular 2-5-U had replaced the mic and key binding posts with the type which have holes to take cord tips. The original posts are smaller than the power posts at the right side of the panel but fortunately the buzzer battery posts remained. Our good friend, Floyd Bennett, turned out some matching posts and we had them plated along with the tap switch levers.

Because of the mad scramble in the 20's on the part of manufacturers to supply the demands

for components and because of the rapid changes to effect improvements, parts in quantity were not always available to Adams-Morgan. We find the 2-5-U sold thru different outlets equipped with three different types of RF meter. The first models used Eldredge 0-1 Amp. Hot Wire meters and some later models used General Radio 127-A 0-1 Amp. hot wire meters. Then there was the raging argument as to whether a thermo-couple type meter was better than the hot-wire type. So we find later 2-5-U transmitters sold thru Montgomery-Ward equipped with Jewell Pattern 64 0-1 Amp. Thermo-couple RF meters. QSL cards in those days often stated radiation as being so many thermo-couple Amperes!

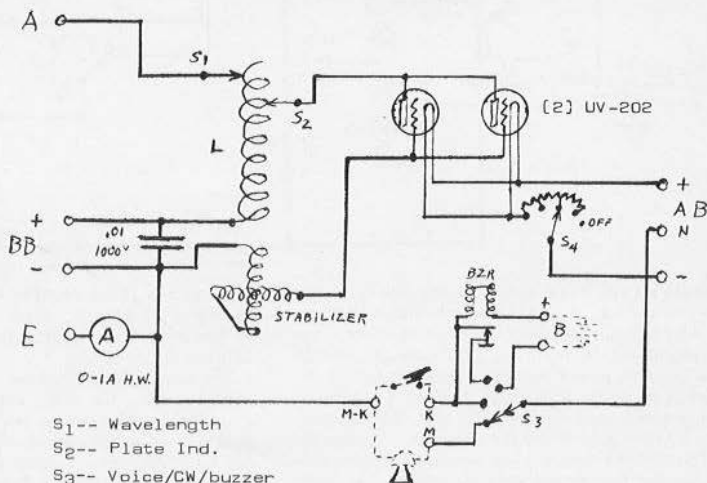
Another production variation concerned the number and placement of panel binding posts. Early models had six standard size postson the right margin with labels, starting at the top, A (Ant), B+, B-, A+, A-, and E (gnd). Along the bottom of the panel were six smaller post arranged in pairs and marked from left: M (mic.), K (key), and B (bat.).

plate supply the note was horrible.

Refer now to the schematic wiring diagram, Figure 2. Lifting the cover and peering inside, we find sockets for two 5 watt tubes with a filament rheostat consisting of wire coils soldered to the contacts of the left hand tap switch. On the right is the coil L wired to two tap switches S1 and S2. At the top of the coil form is the variometer called a Stabilizer. On the left is the RF meter and centered behind the Century High Frequency Buzzer is the Dubilier or Wireless Specialty .01 mfd., 1000 v. plate supply bypass condenser. To the right of the meter is the "Mode" switch, for CW, Fone and ICW. The circuit of the 2-5-U is quite similar to the 1DH circuit and one described by Morecroft in Principles of Radio Communications - pages 586, 587, and 588.

In the diagram the tank condenser is conspicuous by its absence. Like most early CW transmitters and most low power spark transmitters, the antenna was considered the prime oscillating circuit, its capacitance and coil L determining the wavelength. Now, we all know

Figure 2
ORIGINAL
CIRCUIT
OF
2-5-U



Later models had six standard posts on the right labeled: A (ant), + BB -, + AB N -, the E(gnd) post being relocated at the bottom between the Plate and Wavelength tap switches. Along the bottom now were placed five smaller posts labeled: M-K (common), M (mic), K (key), and B (buzzer battery).

The refurbished 2-5-U is now on display at the Museum. It was put thru its paces on a dummy load with a variable condenser substituting for the conventional antenna capacity. These old sets, like all early tube transmitters, had their quirks. Frequency instability was one, and we found that all panel adjustments interlocked. Buzzer ICW and Fone modulation produced sidebands like an FM transmitter and CW keying chirped like the robins. However it was readable on a regen receiver. Using a storage battery and a well-filtered plate power supply, the carrier note was acceptable, but with AC on the filaments and a motor generator

that antennas sway in the wind, swaying trees in proximity change the capacity, and moisture changes in the ground affect the resonant frequency, a rolling ship could almost make the shore operator seasick! Telephony or ICW was not so vulnerable but hetrodyne CW reception was sometimes almost impossible.

Note that the antenna current also flowed thru the .01 condenser---the instruction manual, however, did recommend RF chokes in the B supply, and filament bypass condensers if an AC source was used. Depending upon the impedance matching ratio (the setting of S1 and S2 to obtain the rated tube load and desired wavelength), the stability of frequency was more or less affected by changes in tube parameters caused by heating and keying.

Coil L had a tap range of 6.5 to 70 microhenries and the variometer 160 to 540 microhenries. These rather large values permitted operation from 160 to 352 meters (1875 - 923

