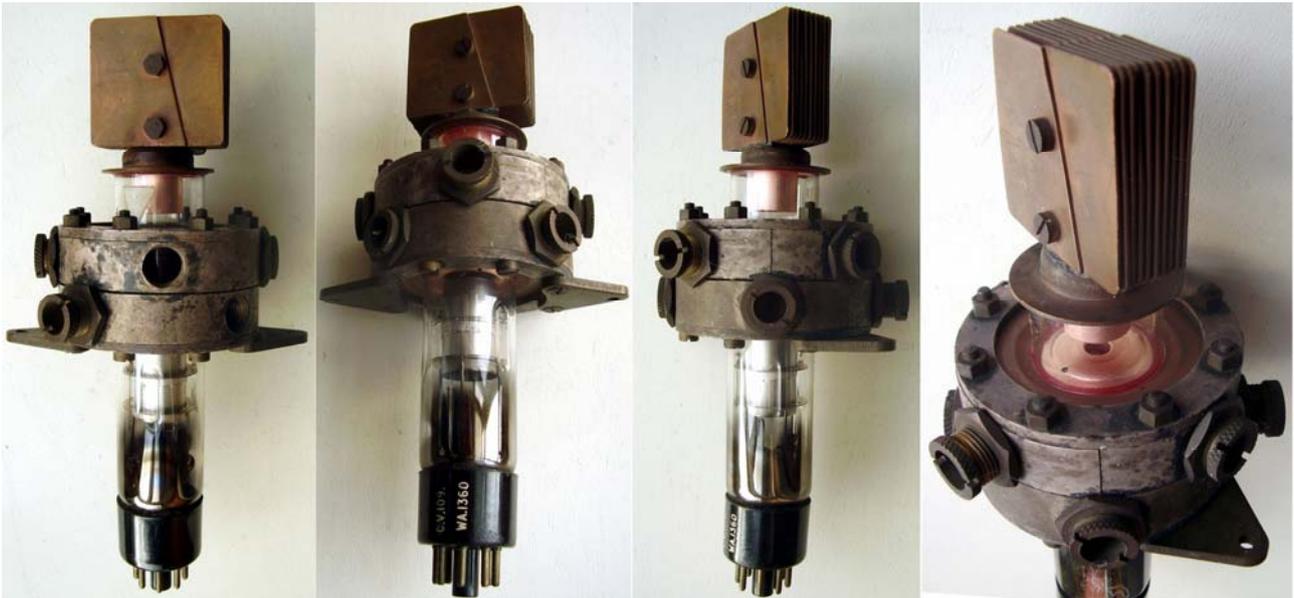


## CV109 - Power Linear Klystron



The CV109 was the title for the prototype 9PK5, where letters stay for Power Klystron. No doubts it was one of the first approved microwave generators, purposely designed for pulse operation in airborne radar transmitters. The introduction of this device could be dated around second half of 1940. It is difficult to reconstruct its development since since it can be seen as the first outcome of the research on power klystrons carried out by the group led by Oliphant at Birmingham. Almost certainly its design started in the Autumn 1939, when EMI was commissioned by the Air Ministry to build a microwave AI (Air Intercept) RDF system. Few information on the early work with klystron transmitters at Worth Matravers from May to July 1940 are given by Bernard Lowell in his 'Echoes of War'. From the Diary of Sir Clifford Paterson we can assume that CV109 prototypes were built at GEC, at that time acting as an EMI shadow factory. Actually, even if it is derived from the experiments of Oliphant and from the work of the AMRE group at Matravers, it embodies an oxide-coated unipotential cathode, first tried at GEC pulse applications by Eric Megaw in July 1940, into his second prototype of E1189 cavity magnetron. We must therefore assume that GEC not only built small quantities of the CV109 tubes, but actively participated in its design.

Very few samples were built, used in the early developments of microwave airborne sets. The power klystron was replaced by the more powerful E1198/CV38 magnetron from March 1941, in the AI Mark VII. The CV109 offered interesting performance, with typical pulse power of about 400 W. Unfortunately for the work done so far on the klystrons, the success of the magnetron E1189 caused further developments to be abandoned. Yet many of the early problems had been solved and people knew how to remove power limitations. In fact for the sole purpose of deceiving the enemy the design was resumed months later, ending in the **PK150/CV150** also in the ase-museoedelpro collection, with oputput peak power increased to 30 kW.

- **2.5 A at 4.0 V heater supply**
- **170 W collector power dissipation, forced-air cooling**
- **3280 MHz operating frequency**
- **250 W minimum output peak power at 7.0 kV collector voltage**
- **3  $\mu$ s typical pulses, up to 18.000 pps duty**