

modulation, the pulse will be modulated with 60 cycle.

This phenomenon (7.) will occur only in the magnetron of the high power and the direct heating cathode type.

---

#### **47. Trial Manufacture of Electron Accelerator.**

*Kiichi Kimura, Isao Kumabe, Tetsuro Nakata, Hidero Ueyanagi  
and Asao Kusumegi.*

(K. Kimura Laboratory)

We achieved a trial manufacture of an electron accelerator using a single cavity resonator. In the first place, we performed the preliminary experiments about the resonant wave length of the reentrant-type cavity, but decided suitable dimensions of the cavity experimentally because we found that the various theories about it provide disagreement with our experiments.

Our cavity is 4.4 cm long, 3.4 cm in diameter, 0.58 cm in nose diameter, 1 cm in the accelerator gap length, about 0.66 M $\Omega$  shunt resistance, and it has gold-plated inside for the requirement of the good conductivity.

Oscillator is a magnetron M-312 (wave length: 10 cm) operated by D.C. 4 kV anode voltage, A.C. (60 cycle) 3.5 kV cathode voltage and external magnetic field of 820 gauss. The above-mentioned cavity resonator was excited by the loop coupling through the cylindrical wave guide and the coaxial cable, and electron acceleration was tested by the electric field (about 20 kV) in the axial direction of the cavity. And 18 kV electrons were obtained. Then input power into the cavity was about 300 W and the pressure was  $3 \times 10^{-5}$  mm Hg. Electron energy was measured on the fluorescent screen by the magnetic deflection. Electrons which were emitted from a Th-W filament and were focused by Wehnelt cylinder, were accelerated at 4 kV and were injected on the cavity. The nose length in the cavity is controlled by bellows from the vacuum outside for the purpose of obtaining the resonance of the cavity.

---

#### **48. On Some Properties of $2\pi$ -type Counter. (II)**

*Yoshiaki Uemura, Yoshio Saji and Sakae Shimizu.*

(K. Kimura Laboratory)

We found that natural counts of  $2\pi$ -type counter were approximately proportional to the length of the center wire of a counter, not to the length of a cathode cylinder.