XI. NOISE IN ELECTRON DEVICES*

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A. EXPERIMENTAL EXAMINATION OF THE MOMENTS OF SEMICONDUCTOR NOISE

The moments analyzer (1) was calibrated and used to measure the moments of semiconductor diode noise. These preliminary measurements were taken at short time intervals; they will be repreated with longer (30-hour) observation periods.

Measurements on a reverse-biased General Electric Company 1N91 germanium junction diode over a 5-hour period gave a value of $\mu_4/\mu_2^2 = 3.08$.

Measurements were made on a Texas Instruments Company 608C silicon junction diode operated in the avalanche breakdown region. In this region, at certain values of the diode current very high noise levels were observed. It can be seen visually that this noise, which was noted earlier by K. G. McKay (2), is nongaussian. Further investigation of this region is planned. Measurements in the well-behaved portion of the breakdown region were taken over a period of five hours. Data were taken every half-hour, and the value $\mu_4/\mu_2^2 = 3.12$ with a standard deviation of 0.096 was obtained.

It is felt that further measurements will confirm the gaussian character of semiconductor diode noise.

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References

1. Quarterly Progress Report, Research Laboratory of Electronics, M.I.T., April 15, 1955, p. 72 (Fig. XI-1).
2. K. G. McKay, Phys. Rev. 94, 877-884 (May 1954).

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