NOTICE: When government or other drawings, specifications or other data are used for any purpose other than in connection with a definitely related government procurement operation, the U. S. Government thereby incurs no responsibility, nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use or sell any patented invention that may in any way be related thereto.
A graphecon tube fitted with a one-sided target electrode is considered. This is illustrated in Fig. 1. The elements of the target are first scanned by the reading beam having an energy of 1 keV and assume potentials near to those of the collector so that the elementary capacitances are charged to \( Q = C_m u_c \), where \( C_m \) is the capacitance of an element of the target and \( u_c \) is the potential difference between the signal electrode (plate) and the collector. The writing beam of energy of 10 keV scans the target (but not necessarily with the same raster as the reading beam). This results in a partial or complete discharging of the elementary condensers, depending on the intensity of the writing beam. The potential distribution so obtained is then scanned by the reading beam of constant intensity and this results in the appearance of a video signal across the resistance of the signal plate; the recorded potential pattern is thus gradually erased. The most important characteristics of the graphecon were measured by the dynamic method (by using pulses). The current of the signal plate, as a function of the potential difference between the signal plate and the collector for two values of the beam current is illustrated in Fig. 3. It is seen that when the target is bombarded by an electron beam a current is produced in the signal-plate circuit; this current changes its polarity when the voltage between the collector and the signal plate is varied. The dependence of the signal-plate current on the acceleration potential of the electron beam and the potential of the correcting ring was also measured. An equivalent circuit for the signal plate is suggested; this consists of 5 resistances, 3 stray capacitances and \( C_m \). Spurious signals and noise in the signal-plate circuit can be reduced by using the peculiarities of the current-voltage characteristic of the target; it is noted that the current is zero at a certain fixed potential of the signal plate. The noise reduction can also be achieved by using the correcting ring as the signal electrode.

There are 11 figures.