for most investigations. Its replacement by a quartz rod would improve the light conduction.

Finally, curves (d) and (e) of Fig. 2 show the results for the crystal placed with the ⅛ in. × ⅛ in. surface facing the Lucite rod, with and without Al foil. In this position the surface area and therefore the number of incident primary gamma rays was only ¼ as compared with the conditions for curves (a), (b), and (c). The extrapolated counting rates, however, were nearly the same as before. The crystal sensitivity, therefore, seems to increase in proportion to the crystal thickness. These results are in agreement with the approximately 100% sensitivity for Ra gamma rays reported by Moon (*4*), for a $CaWO_4$ crystal about ⅜ in. thick.

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Adapter For Visual Monitoring with Portable Geiger-Müller Equipment

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The application of a neon-filled strobotron (SN4) tube as a visual means of continuous monitoring of areas in which radioactive materials are used has proved itself very convenient.

Fig. 1 is the schematic diagram of a circuit developed for using an SN4 (manufactured by Sylvania Electric Company) as a visual indication of instantaneous changes in counts, that may be due to contamination or changes in background.

The circuit is enclosed in a metal box which has a large bull's-eye lens directly in front of the SN4. This circuit was developed to operate directly from the earphone jack of the Herback and Rademan Geiger-Müller Radiation Measuring Set, Model GLR-200.

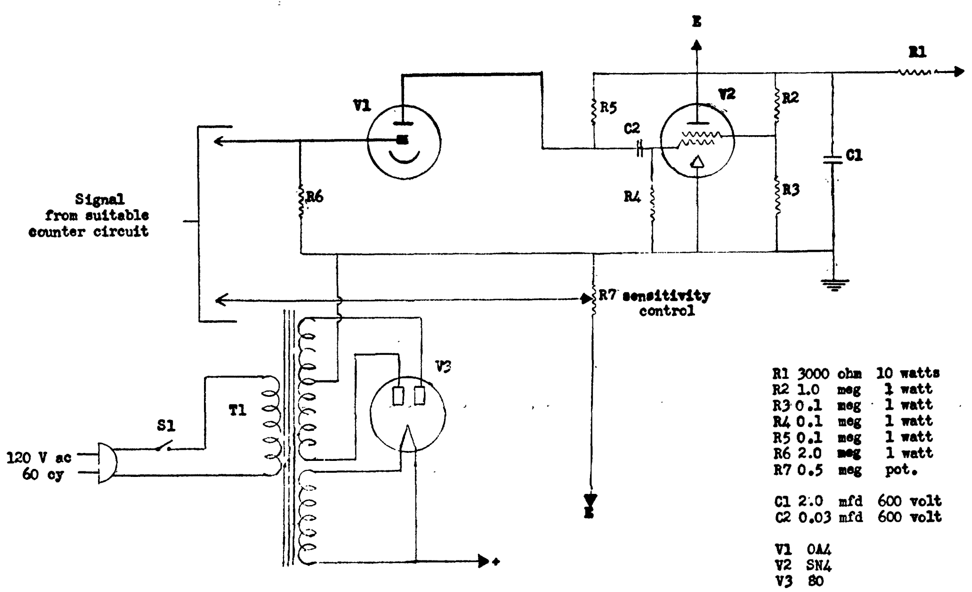
The signal is superimposed on a d-c voltage which in effect produces a pulsating d-c voltage having a positive sign. The d-c voltage is adjusted to a value just below the firing point of the OA4 by sensitivity control R7. Thus, the incoming signal increases the potential of the d-c value to a point that will cause this tube to fire.

Resistor R6 has to be of a value that will keep the potential on the starter anode at the same value as the cathode, and yet of high enough value to prevent excessive loading of the output stage of the Geiger-Müller circuit.

When the OA4 fires, condenser C2 is momentarily shorted to ground through resistor R4, at the same time the plate voltage is reduced to a value which will not support operation. With the OA4 in an extinguished state, condenser C2 recharges through R5, thus impressing a positive voltage of sufficient value on the starter anode of the SN4 to cause it to fire. The SN4 will become extinguished when the potential of C1 falls below the critical operational potential. Following these events C1 becomes recharged through R1, thus conditioning the circuit for another firing sequence.

The operation of the circuit is dependent upon the height of the voltage pulse from the output stage of the Geiger-Müller circuit. This pulse must have a value of not less than 5 v.

The sensitivity of the instrument is directly dependent upon the Geiger-Müller tube used and the preliminary cir-



CIRCUIT DIAGRAM

Fig. 1.

cuit. In our laboratory a Radiation Counter Laboratory Type 10A Beta-Ray Counter Tube obtained from Tracerlab, Boston, Massachusetts, having a glass wall of 30 mg/cm², or about 0.12 mm thick, is used. With the setup described, 3 μc of P^{32}, I^{131}, and Ra salts give a flash rate about twice background, at a source distance of 25 cm.

The OA4 tube was selected as it has characteristics that require small wattage for operation.

As the pulse sequence of the circuit is very short, having a duration of a few microseconds, the SN4 was selected for its very high illuminating intensity.

No attempt has been made to develop a quantitative measuring instrument, as the primary requisite is for detecting infinitesimal amounts of radioactive substances on clothing, hands, glassware, sinks, and counter tops around the laboratory.

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summarized a paper by Van Lear and Long, describing an American commercial Raman spectrograph.

Other physical measurement methods were described by Madame Y. Cauchois, of the Laboratory of Physical Chemistry, Paris, who gave two papers—one on new developments of bent crystal techniques and one on curved crystal X-ray spectroscopy. In the same section A. Guinier, also from Paris, talked about demountable tubes and cameras for X-ray crystallography and some recent techniques in X-ray metallography.

Among the mechanical measurements discussed were two methods for photographic recording of ultrahigh speed phenomena by explosions, described by C. H. Johansson, of Detoniklaboratoriet, Stockholm. In one, instantaneous photographs are taken with an ordinary camera, using sparks or flash lamps as light source and a Schlieren apparatus. By repetition, lighting at successive time intervals being reckoned from the start of the explosion, quantitative measurements of the velocity at different stages of the occurrence can be made. Intervals from 2 to 500 microseconds are obtained by a detonation fuse. Other papers in this section included one by Robert Schnurmann, of the Manchester Oil Refinery, Ltd., England, on lubricant testing methods, and one by Pierre Piganiol, of the St. Gobain Company, Paris, on the measurement of the melt viscosity of plastic materials.

In the division of industrial control, R. S. Medlock, of the British firm George Kent, Ltd., spoke on the analysis of oxygen, based on its paramagnetic properties. With the exception of nitric oxide, oxygen appears to be the only strongly paramagnetic gas, and this affords a physical method of measurement. Other lectures included two by W. F. Hanson, of the Du Pont Company, and Maurice Surdin, chief of electrical construction services for the French Atomic Energy Commission.

Papers on metrology included one by Rene Yribarren, of Société d'Application de Metrologie Industrielle, Paris, who spoke on "Some Considerations About Accurate Fits." He described the contribution of the Solex air-operated method to the present problems of industrial metrology. All of the apparatus he described had the same object, he said—to incorporate inspection within the machining department, and to make measuring techniques formerly used for judging into guides for production. Other papers were read by A. Metz, of Ernst Leitz, Wetzlar, Germany, and Karel Veska, of Kovo Ltd., Prague, Czechoslovakia.

As part of the conference, a fairly large exhibit had been arranged, with a floor area of more than 30,000 square feet. Among the exhibitors were the French Atomic Energy Establishment, the French Defense Research Establishment, the German East Zone, and several of the main instrument manufacturing firms in Sweden. The greater part of the exhibit was commercial.

Perhaps the most interesting part of the exhibit was that arranged by the Swedish State Council of Technical Research in cooperation with the Academy of Engineering Sciences and the Association of Technical Physicists. Here was shown instrumentation research under way in Swedish institutions and laboratories. The committee on large computing machines showed parts from their project on a binary relay machine.

Other computing machines shown at the exhibit included an analogue computer for aircraft stability problems, an automatic recording Fourier synthesis apparatus, and parts from a mechanical differential analyzer with four integrating units, under construction at the Chalmers Institute of Technology.

New developments of direct-reading pH-meters, usable for all types of potentiometric measurements, and polarographs with a maximal sensitivity for full-scale diffraction of 0.0033 microamperes were shown by the Chemical Institution of the University of Upsala.

The Department of Telegraphy and Telephony at the Royal Institute of Technology had a wide range of apparatus, among which may be mentioned an automatic impedance meter for automatic recording of locus diagrams of networks within the range of 100 to 15,000 kilocycles per second, a heterodyne filter that can be used as a band-pass filter with continuously variable high and low frequency cutoff, that has an attenuation of 1 to 2 cycles per decibel.

In the field of electronics the Department of Electronics at the Royal Institute of Technology showed a 37-Mev synchrotron and a new development of the trochotron for pulse counting. The counting rate of a scale built with this new tube is 10 megacycles per second.

The Department of Electronics at Chalmers Institute of Technology showed experiments on radio wave propagation, a radar search for meteors, and the latest development in the traveling wave tube.

By special invitation, the U. S. National Bureau of Standards, the National Research Council of Canada, the RCA Research Laboratories and the Bell Telephone Laboratories had arranged booths in this part of the exhibit.