Letters to the Editor

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A fast electronic circuit to measure spill time

P N. Upadhyay

Department of Physics, Gaya College, Gaya, Bihar

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In some nuclear physics experiments, a study of the accidental becomes essential. The knowledge of spill-time, the time during which a beam burst lasts, enables the estimation of the accidental. A new fast electronic circuit called spill monitor was designed to measure spill-time. Let T be the averaged time during which a burst lasts. Consider two counters S_1 and S_2 which count N_1 and N_2 per burst (on the everage) respectively. The number of chance coincidences N_c between these two counters with a resolving time τ is given by

$$\frac{N_c}{T} = \frac{N_1}{T} \cdot \frac{N_2}{T} \tau$$

or,

$$T = \frac{N_1}{N_c} N_2 \tau.$$

Suppose a pulse (say) after every 1000 counts (from N_1), opens a gate which is closed by N_c. The number of N_2 pulse is counted in the gate. Thus, T can be directly found.

The electronic system was built using *standard miniature logic systems* (Milborrow 1968) The cards were available in standard AND *gate, OR gate, Set-Reset, discriminator, level change* and a few other forms.

Each photomultiplier pulse of the counters S_1 and S_2 was fed to a AND gate via a discriminator (figure 1). A scaler SC1 was included to gives out a

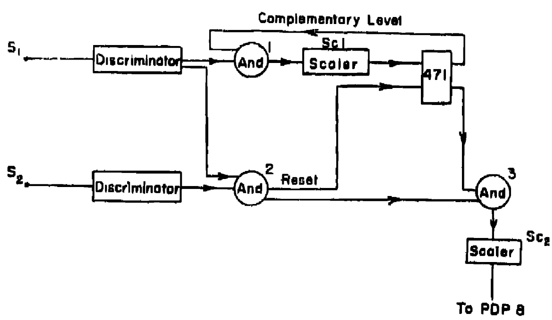

Fig. 1 A Circuit to measure spill time.

pulse per 1000 input pulses fed from S_1. In order to open a gate, this was connected to an especially made *Set-Reset* type card called 471 card. The coincidence between counters S_1 and S_2 was made in AND gate 2. In order to record the the number of S_2 pulses in the gate, a pulse from S_2 counter and the gate produced by the 471 card were fed in AND gate 3. When the gate was closed, the 471 card provided a complementary level to AND gate 1. The AND gate 1 gave output only in presence of this complementary level and a pulse from the counter S_1. The output of the AND gate 3 was connected to a scaler SC2. The number was recorded on a magnetic tape by a PDP-8 computer

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Force constants and mean amplitudes of vibration of some trihalogen complexes MX_3^- (M = Zn, Cd, Hg) and $SbCl_3$ (in different states)

NITISH K. SANYAL, R. K. GOEL* AND A. N. PANDEY**

Department of Physics, University of Gorakhpur, Gorakhpur 283001

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The force constants and mean amplitudes of vibration for CdX_3^-(X = Cl, Br, I) and $SbCl_3$ have been computed earlier by Sanyal & Singh (1971) assuming planar structure and by Rai & Thakur (1970) assuming pyramidal structure respectively. Waters *et al* (1973) have recently reported the complete analysis of the vibrational spectra of haloanions of II-b group elements, i.e., MX_3^- (where M = Zn, Cd, Hg and X = Cl, Br, I) while Fung *et al* (1973) have studied the Raman specta of $SbCl_3$ in solid and molten-states. Both these groups of workers have assumed pyramidal structure. It thus appears worthwhile to compute the force constants and mean amplitudes of vibration of these systems

The Genral Valence Force Field (GVFF) has been used for the computation of force constnts using Wilson's F-G matrix method (1955, Claeys & Van der Kalen 1966). The potential model includes five force constants, *e.g.* f_d (bond-stretching), f_α (angle-bending), f_{dd} and $f_{\alpha\alpha}$ (bond-bond and angle-angle interaction respectively) and $f_{d\alpha}$ (bond-angle interaction) constants. Since only four fre-

* On Leave From—Department of Physics, D. N. College, Meerut, U.P.

** Present Address : Department of Physics, Meerut College, Meerut, U.P.