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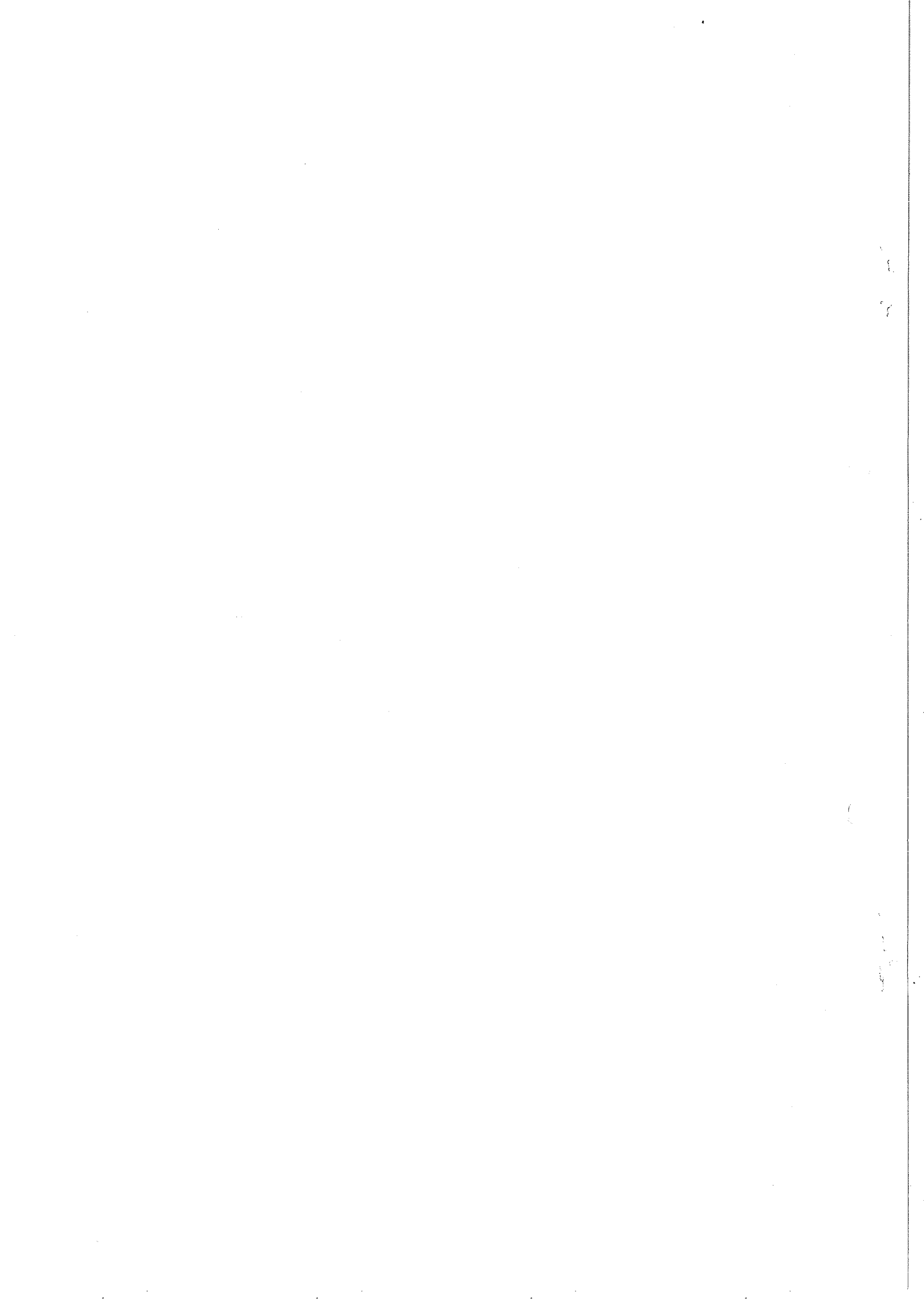
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TESTS OF A HYBRID VERSION OF A PROPORTIONAL
CHAMBER AMPLIFIER, DELAY AND MEMORY

A. Fainberg, R. Hammarström, C. Rubbia and K. Tittel

G E N E V A

1970



A hybrid version of proportional chamber electronics (four-channel unit) has been developed at Harvard University by B. Dunn, J. Pilcher and C. Rubbia. The unit has been constructed by Film Microelectronics, Inc., (Mass.).

The main characteristics are:

Input threshold (current mode)	$\sim 3 \mu\text{A}$
Delay duration (preset by manufacturer)	300 nsec
Type of memory	Shift register, send or parallel mode.
Output levels	TTL

The circuit is constructed in a standard 40-pin dual on-line plastic package (Fig. 1).

The time slewing is shown in Fig. 2. It has been determined with artificial pulses of shape similar to the one of the actual chamber.

Efficiency curves for one such channel are shown in Fig. 3. The chamber used is described in Ref. 1. It has a sensitive area of $680 \times 390 \text{ mm}^2$, a wire spacing of 2 mm and a gap of 6 mm. The wire diameter is 20μ . The gas filling is 83% argon, $\sim 17\%$ isobutane and 0.4% freon. The performance of the circuit is completely satisfactory.

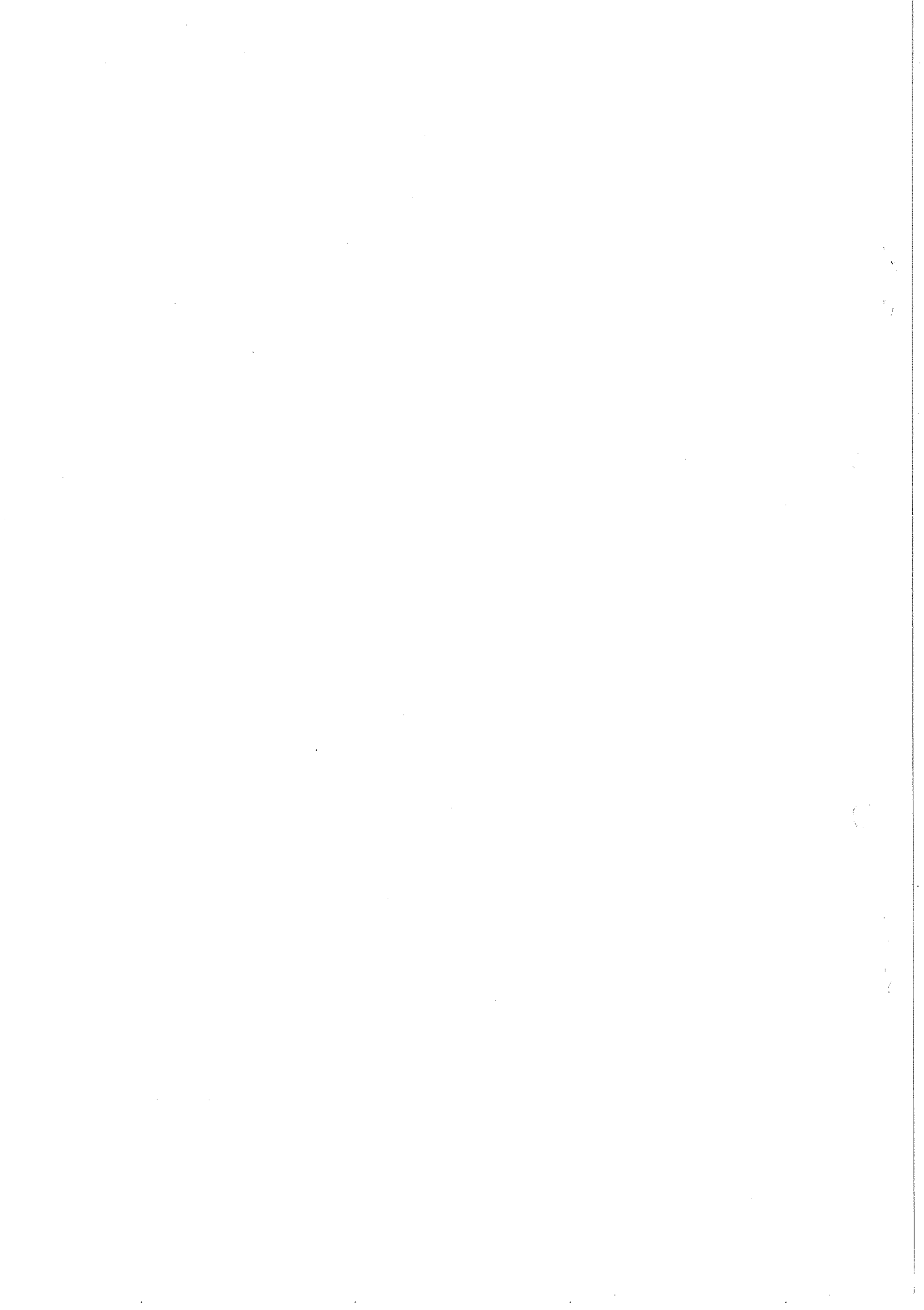
The total cost of each unit, including development, consultant's fee, etc., is of the order of \$5.00 per channel for the first 10,000 units. Delivery times on such quantities are of the order of 2 months.

REFERENCE

- 1) K. Bussmann, A. Fainberg, R. Hammarström, E. Radermacher, C. Rubbia, A. Staude, P. Strolin and K. Tittel, CERN NP internal report 70-34, 16th December 1970.

Figure captions

- Fig. 1 : Photograph of the circuit.
- Fig. 2 : Time slewing versus input pulse current.
- Fig. 3 : Efficiency curve for ^{106}Ru source and magic mixture (83% argon, 17% isobutane, 0.4% freon).



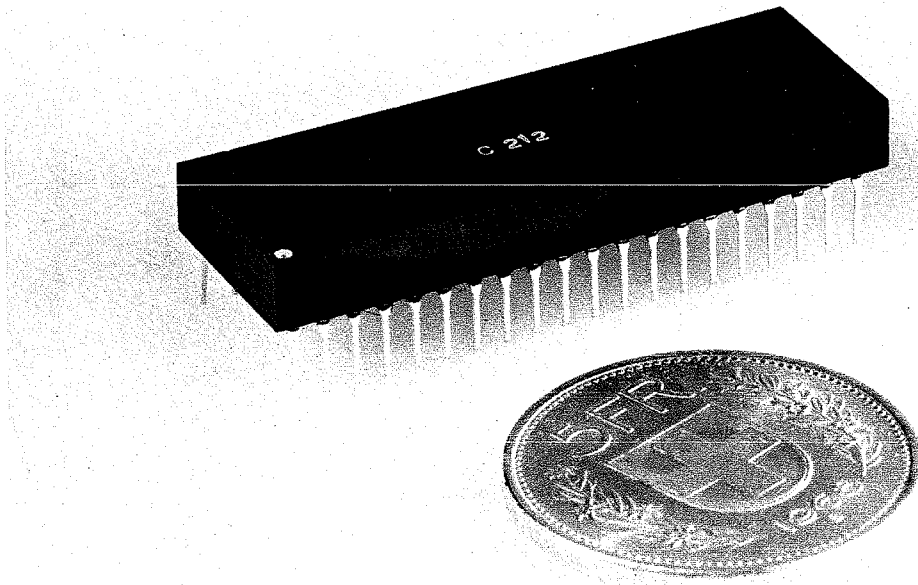
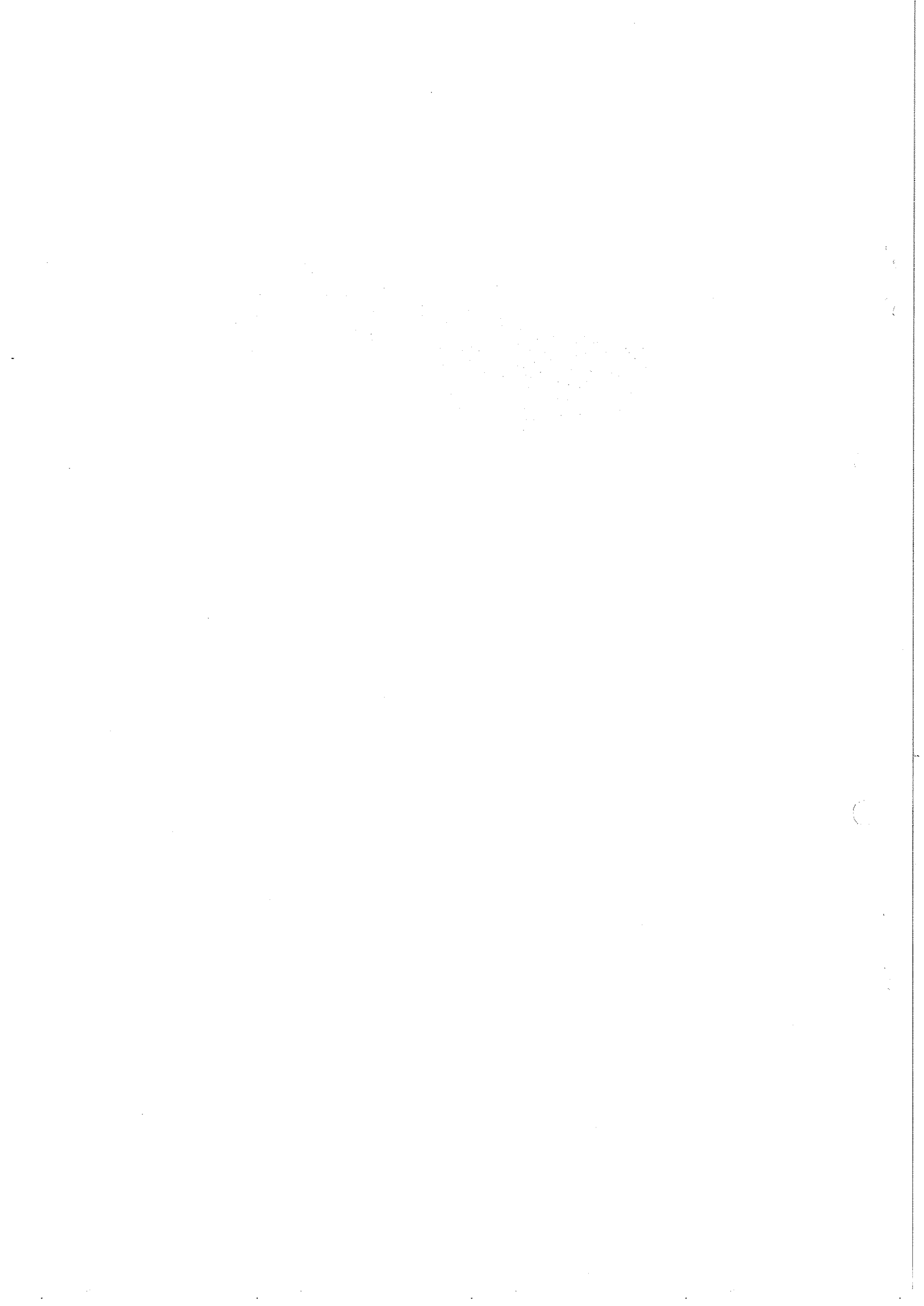


Fig. 1



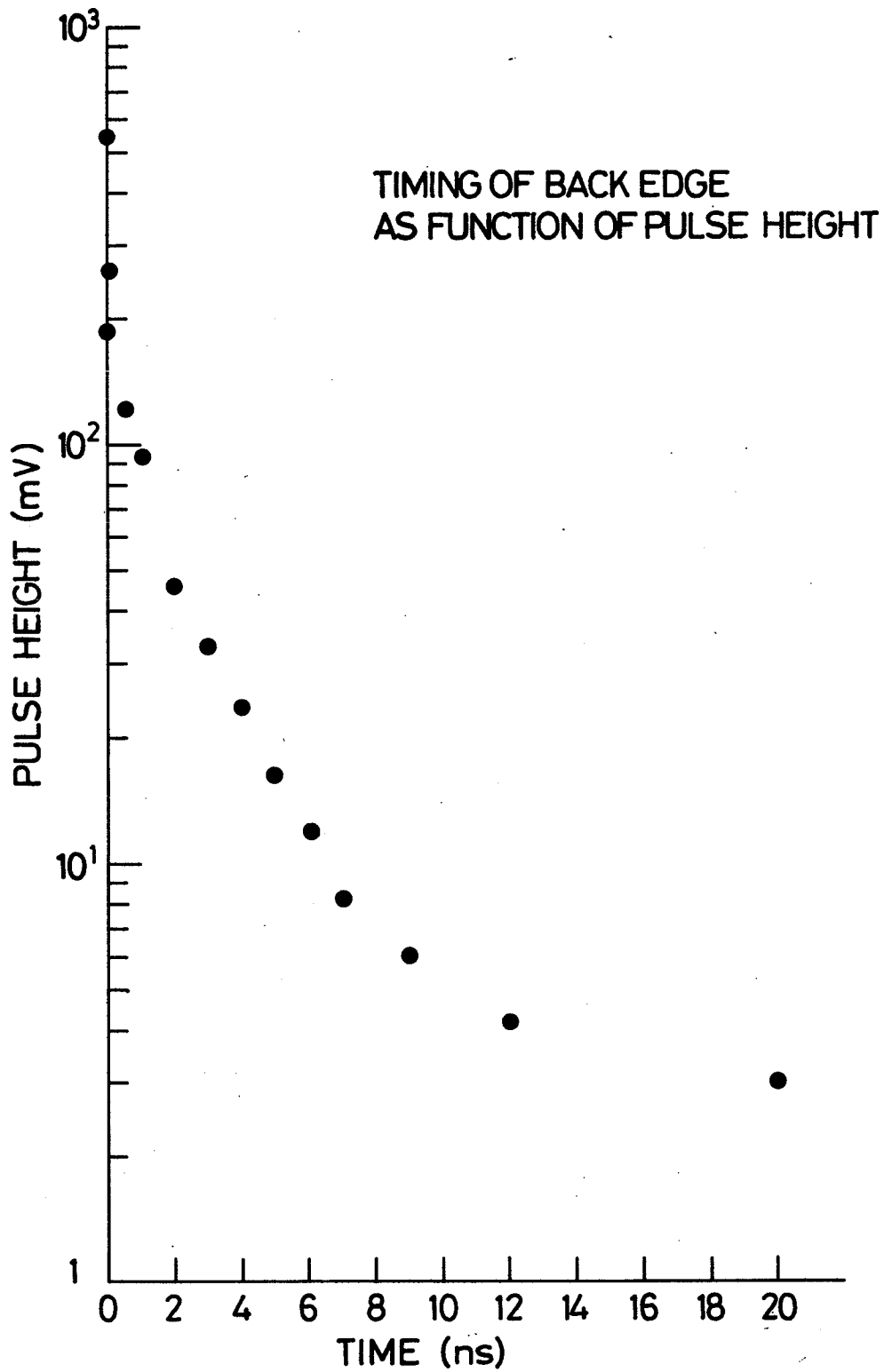
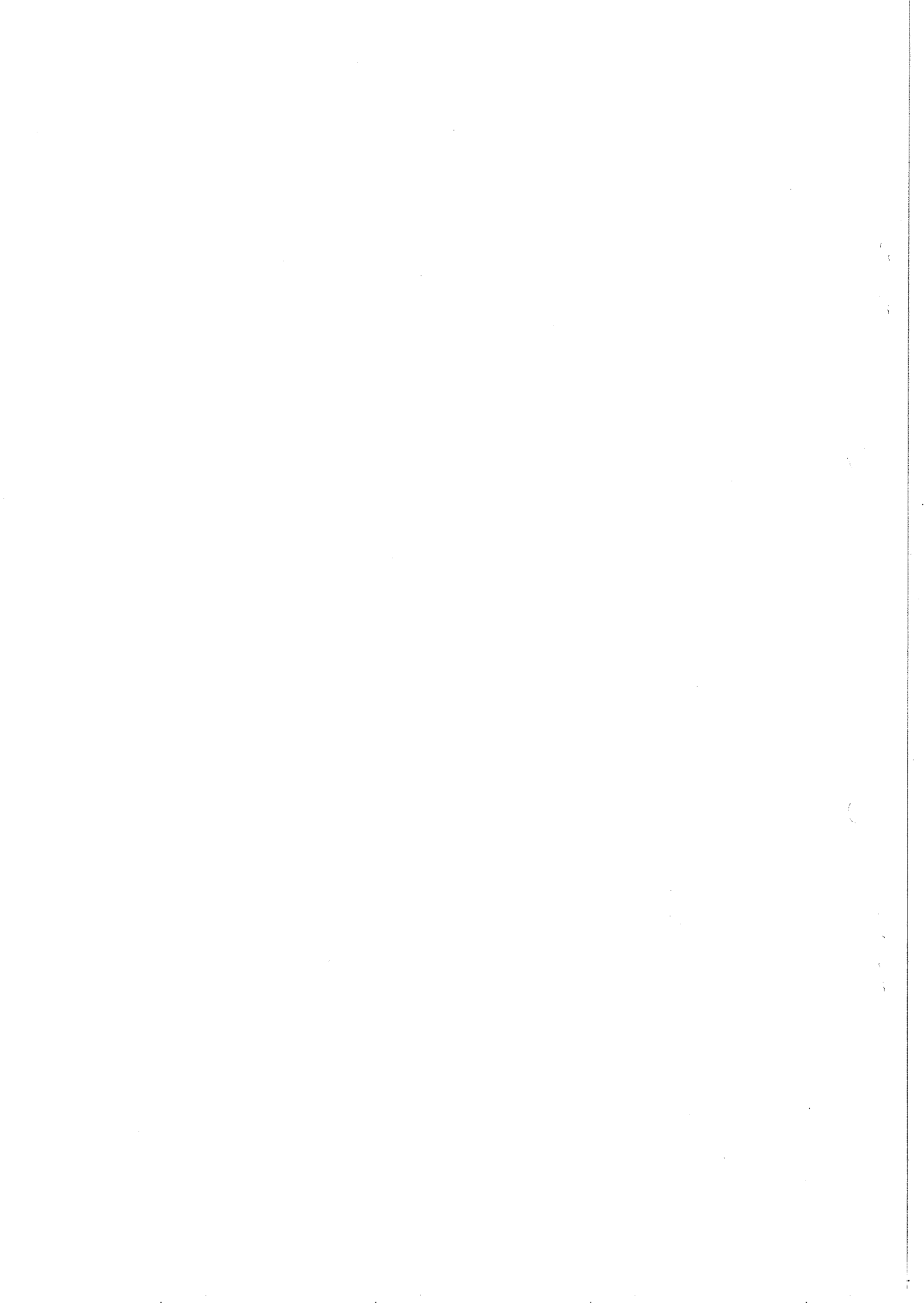


Fig. 2



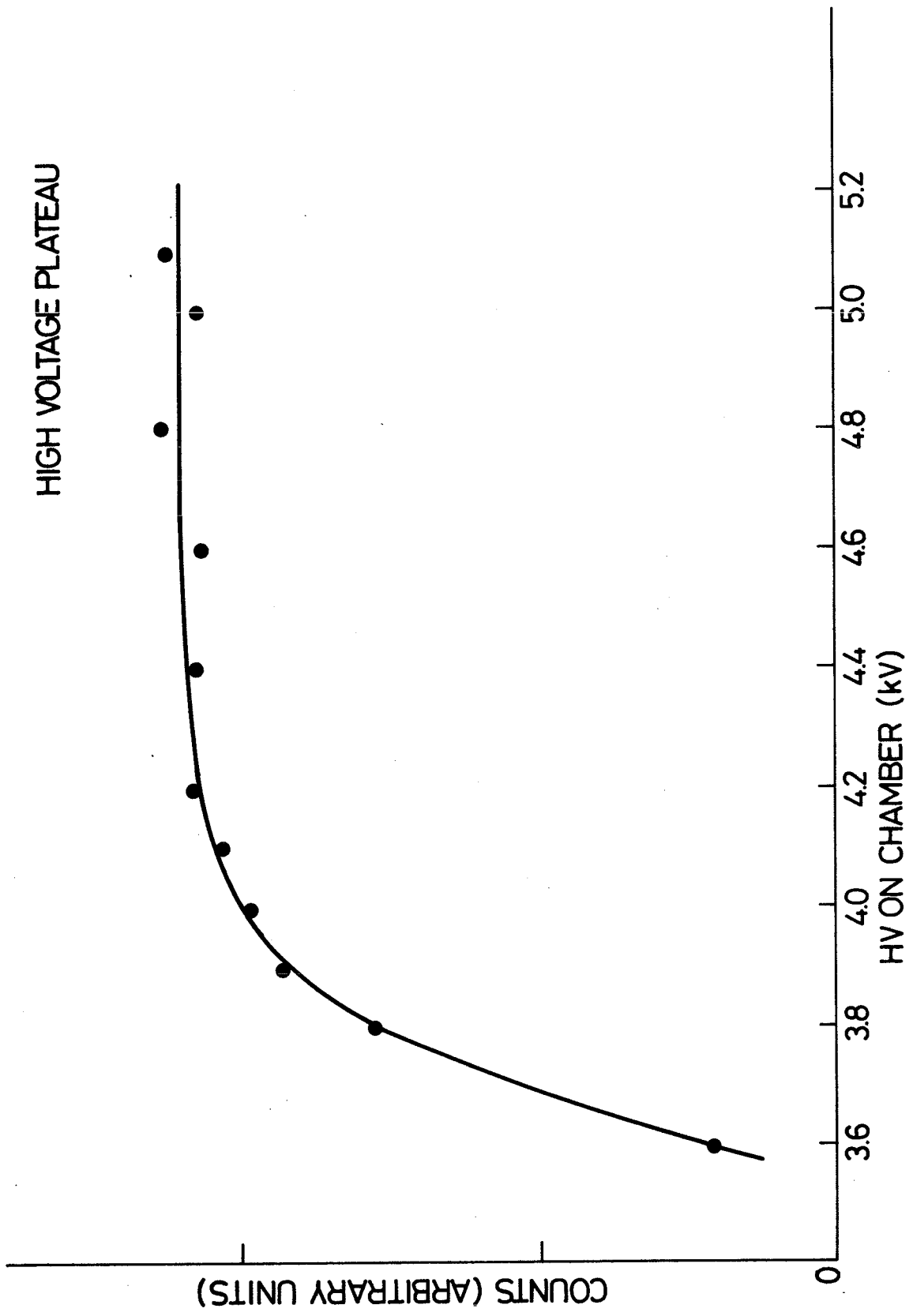


Fig. 3

