III.C MICROSONIC DETECTOR (MSD)

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A. Properties

1. Good spacial resolution
2. Moderate flux capability
3. Moderate event rate
4. Small volume

B. Purpose

1. Short-lived phenomena (B mesons, charms, etc.)

C. Characteristics: Demonstrated To Be Feasible

1.	Active volume	2 cm × 2 cm × 0.3 cm
2.	Density	1.5 cm/cm^3
3.	Absorbtion length	82 cm
4.	Radiation length	11 cm
5.	Spacial resolution	< 10μ

D. Characteristics: To Be Demonstrated

1.	Resolution in space	< 5 microns
2.	Rate	10^5 - 10^6 charged particles/s

E. Principle of Operation

The MSD is a super clean bubble chamber driven at 10-50 kHz

F. Experimental Use

In an experiment, it would be used as a vertex detector to detect short-lived particles (B mesons, etc.). It would be followed by an atmospheric streamer chamber to detect longer lived particles (charm, etc.). Both optical devices would be followed by a downstream multiparticle spectrometer with good particle identification (i.e., similar to the spectrometer associated with the FHS).

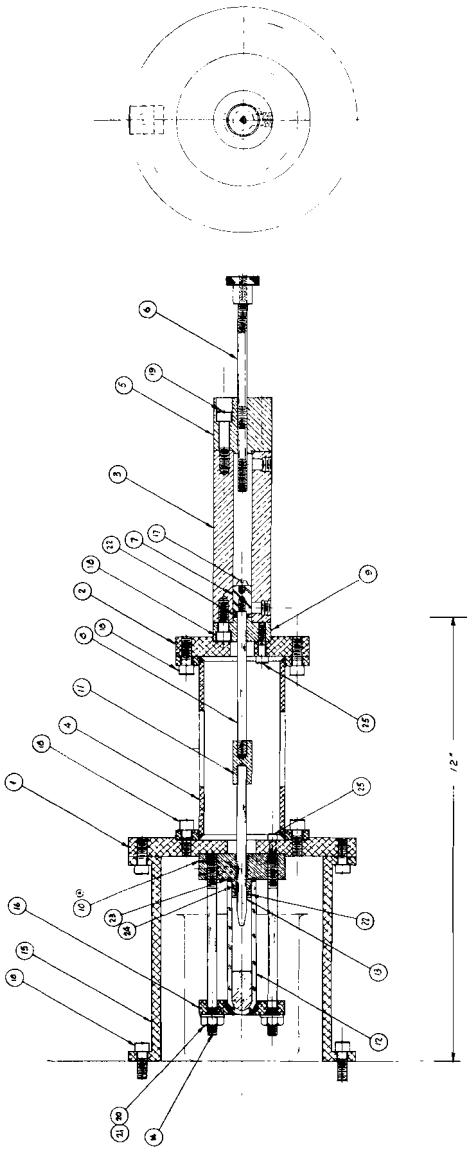

Fig. 1. The sensitive fluid (CF_3B_r) is completely encased by the inert fluid ($C_2H_6O_2$). The freon is heavier than the glycol and rests at the bottom of the test tube (12). The glass piston (12) by a two-way air cylinder which alternately expands and compresses the sensitive freon by means of the inert glycol.

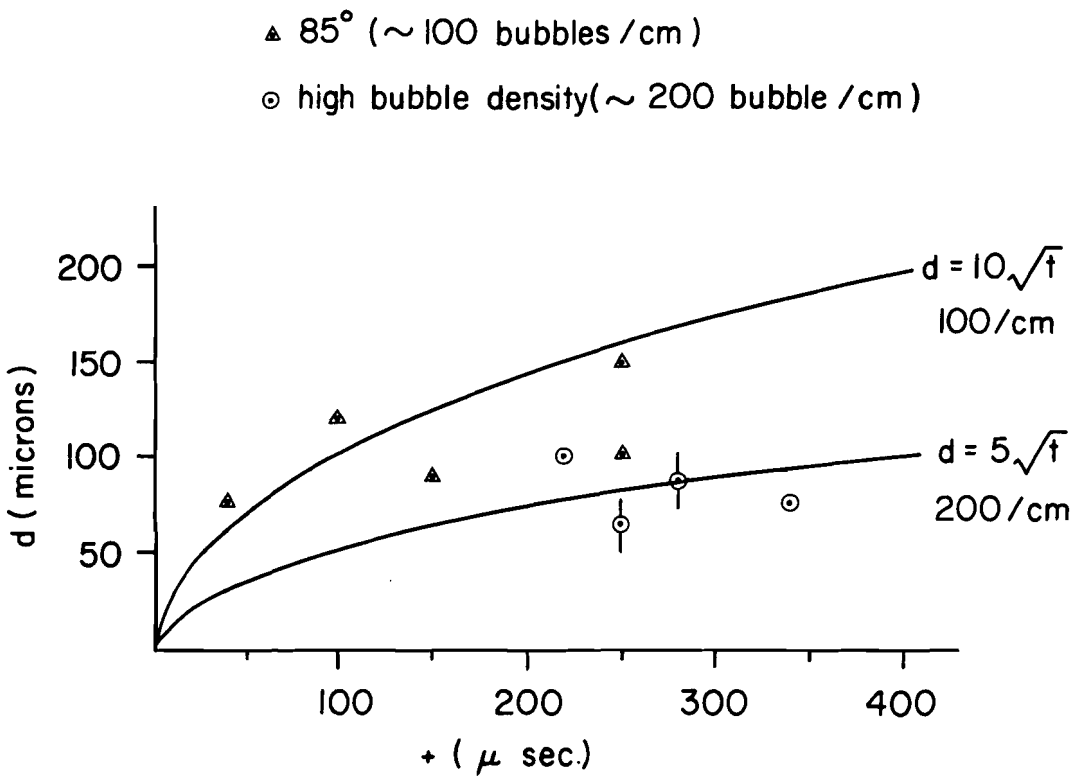

Fig. 2. Bubble diameter vs flash delay time.

Fig. 3. Photograph of 130 MeV/c photon bremsstrahlung beam.

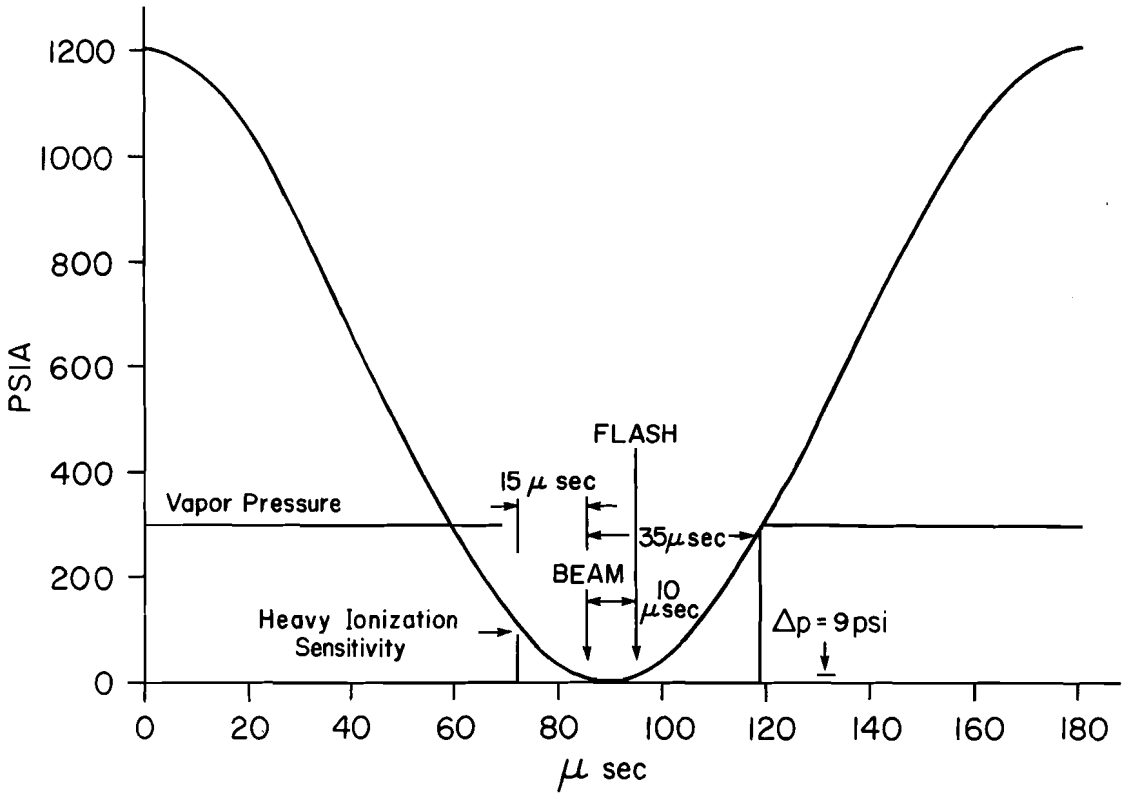

Fig. 4. Typical 5.5 KHz operation. (Proposed).