

## ii. The Acceleration rf Cavity and Driver System

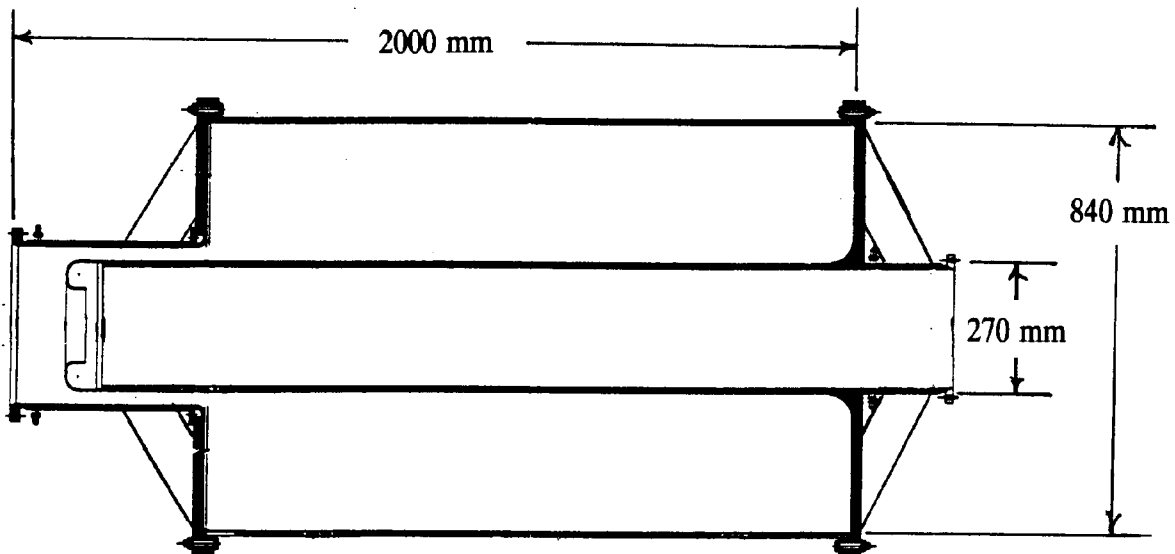
The accelerating system consists of two 28.15 MHz cavities per ring, each with an integral power tetrode, to provide the necessary 600 kV per ring accelerating voltage.

A preliminary design shown in Fig. 7-4 consists of a capacitively loaded coaxial line with a 4CW150000 EIMAC tetrode close coupled ( $\approx 20:1$ ) to the cavity.

The theoretical shunt impedance is  $1.0 \text{ M}\Omega$  with a Q of 16290 which, when derated 10% to  $0.9 \text{ M}\Omega$  and  $Q = 14661$ , leads to a dissipation of 50 kW at 300 kV. When combined with the 2.654 kW beam power, this yields a modest 52.6 kW. Since the power tube is rated at 150 kW plate dissipation, there is sufficient reserve to enable any reasonable upgrades with existing components. The accelerating gap is 55 mm, providing a large safety margin on attainable gap voltage.

This preliminary design concept is being studied in detail under an R&D plan consisting of:

- Susceptibility of geometry (with and without coatings) to multipacting.
- Implementation of local rf-feedback with a high gain tetrode in the final stage to reduce the beam-induced voltage during injection.



**Fig. 7-4.** Acceleration rf cavity.