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BOOSTER CHAMBER APERTURE

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U.S. Department of Energy

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BOOSTER MECHANICAL APERTURE

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The AGS booster vacuum chamber is made of round pipe, bellows and special segments. The physical clearance to the circulating beam is limited by the walls of the chamber and by several specific pieces, like kickers, septa, absorbers. The following figures represent our present understanding of the booster aperture, obtained with a patient review of all the mechanical drawings of the machine.

In the figures, the beam moves from left to right (the opposite convention than on most engineers' drawings)

The distance along the ring, in meters (approximate to one mm), is given with reference with the "standard" MAD output[1]. Good reference points for the position of the vacuum chamber segments are the locations of the quadrupole centers. The clearance is given in mm (rounded to 1 mm), from axis to wall.

In the same figures, we have plotted also the beam envelope in the following scale:

$$a_x[\text{mm}] = \frac{\sqrt{\beta_x[\text{m}]}}{80}\,,\quad a_y[\text{mm}] = \frac{\sqrt{\beta_y[\text{m}]}}{120}$$

i.e. the amplitude of a beam with the following emittance

$$\varepsilon_x = \frac{1}{64}\,10^{-2}\,\pi\ \text{m-rad} \cong 150\,\pi\ \text{mm-mrad},\quad \varepsilon_y = \frac{1}{144}\,10^{-2}\,\pi\text{m-rad} \cong 70\,\pi\ \text{mm-mrad}$$

Like the reference MAD run, this review is clearly not final. Adjustments will happen because of survey results and because "something" may be moved or changed.

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[1] A.Luccio and M.Blaskiewicz *AGS Booster Parameters (MAD Output)* Booster Technical Note # 196, July 23, 1991

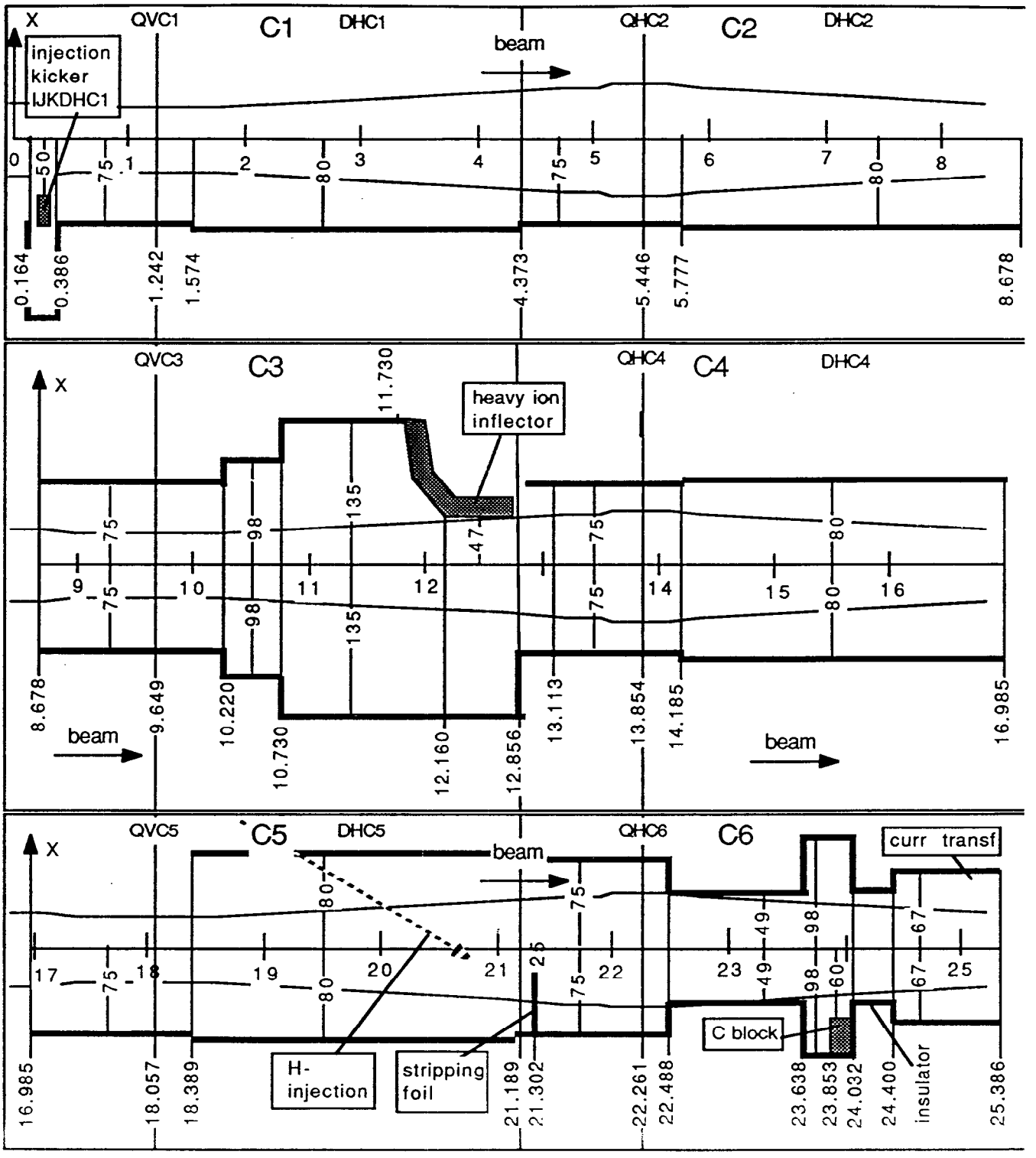

Fig.1. Horizontal aperture. C1 to C6.

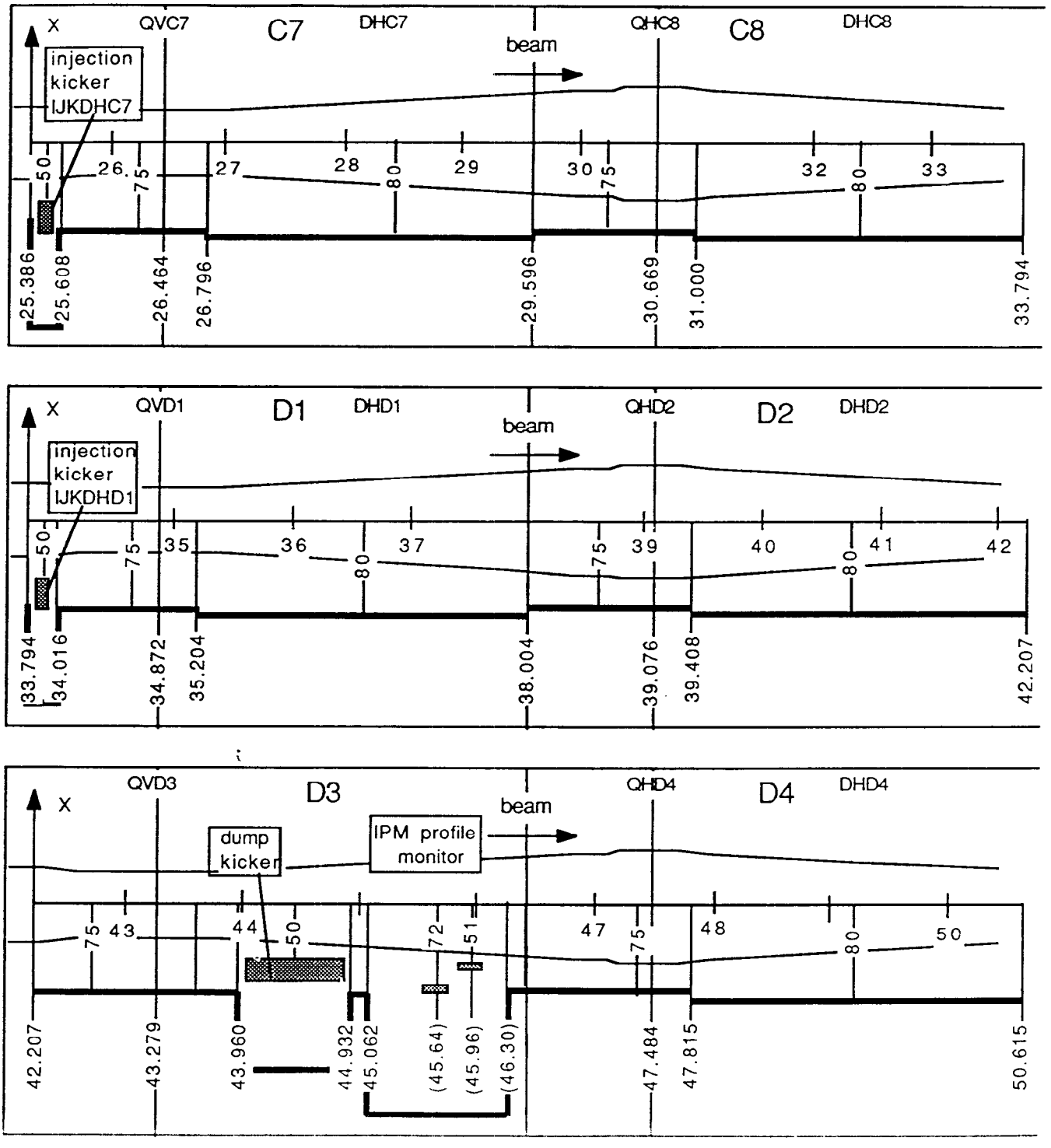

Fig.2. Horizontal aperture. C7 to D4.

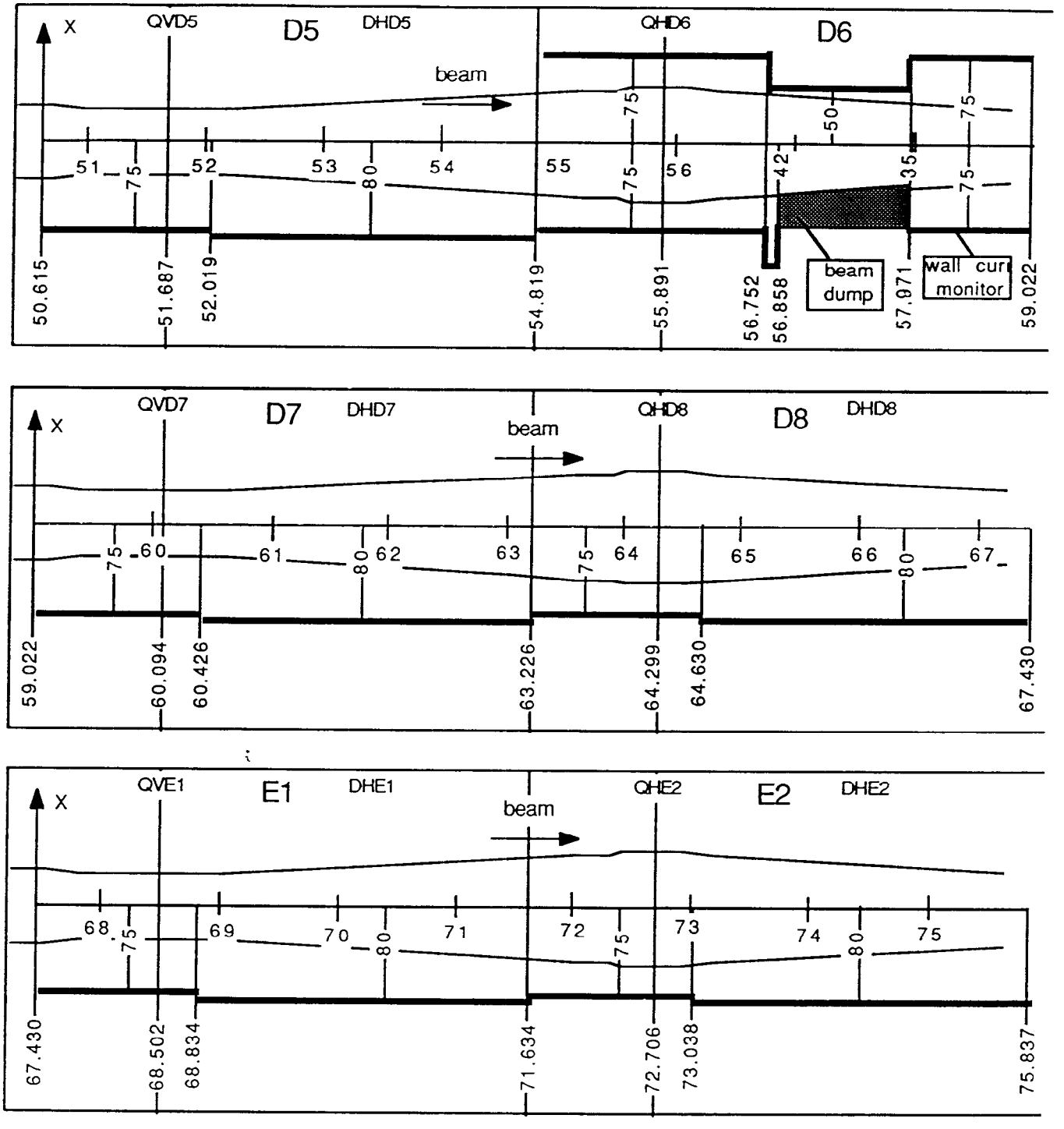

Fig.3. Horizontal aperture. D5 to E2.

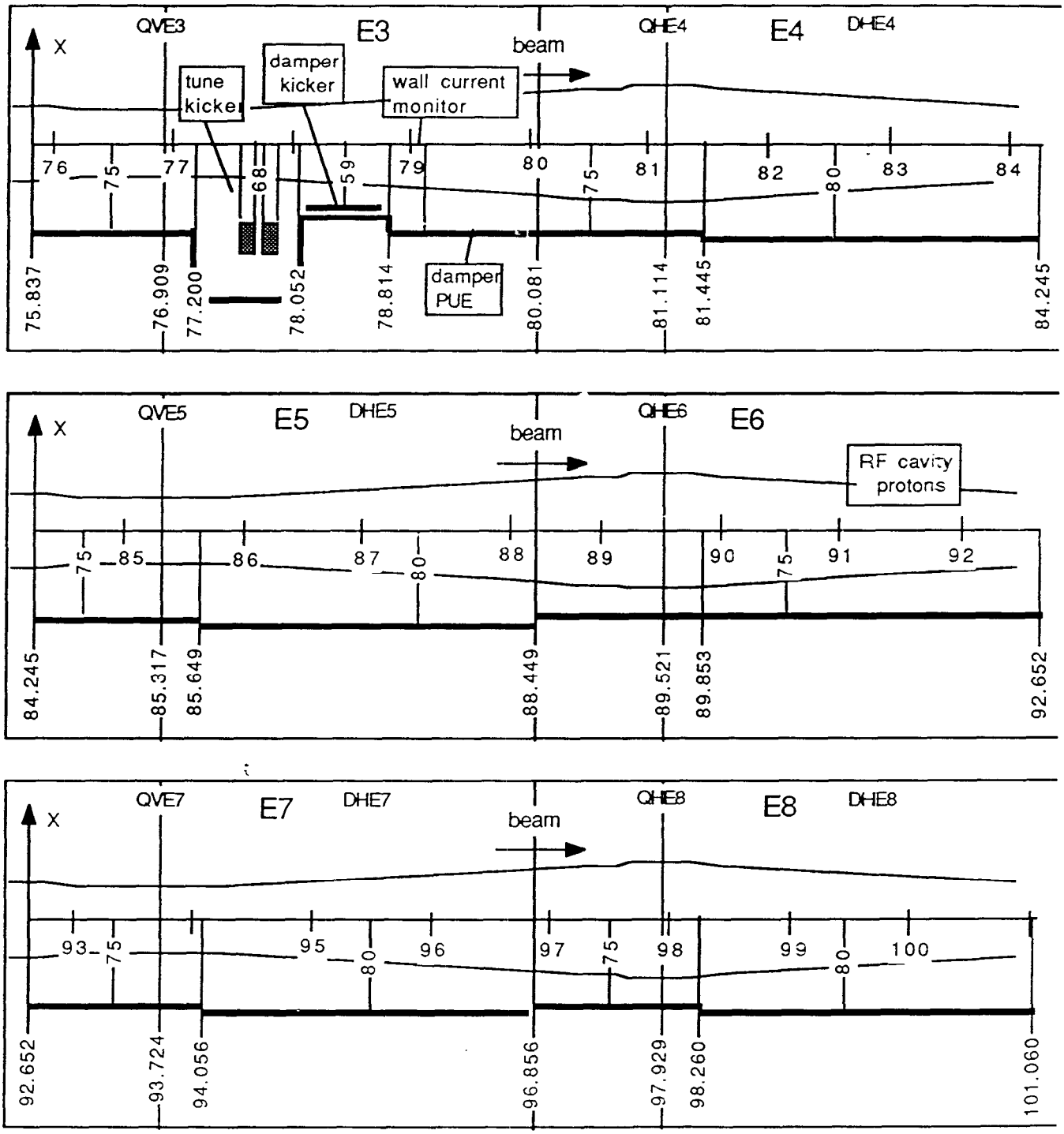

Fig.4. Horizontal aperture. E3 to E8.

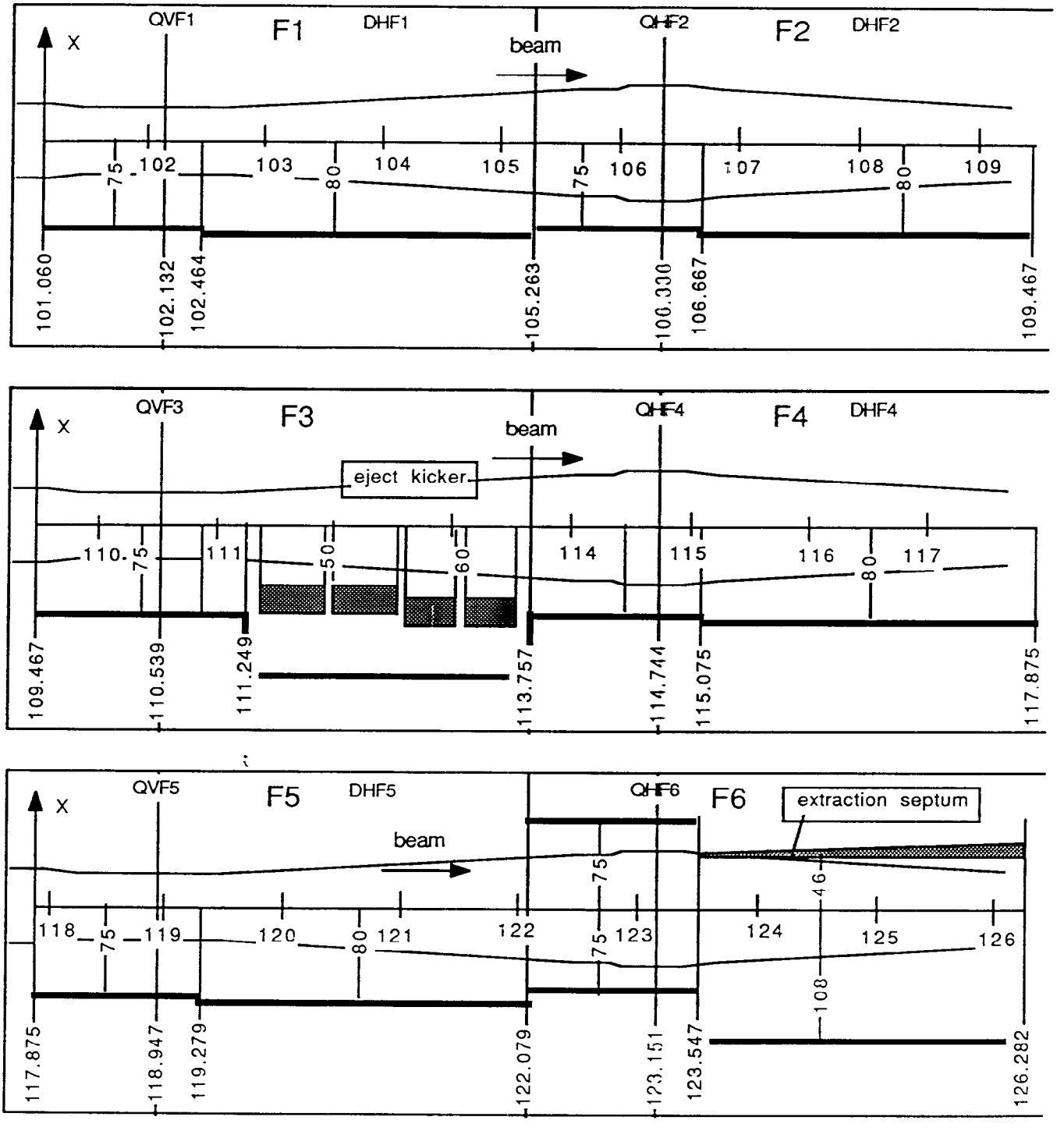

Fig.5. Horizontal aperture. F1 to F6.

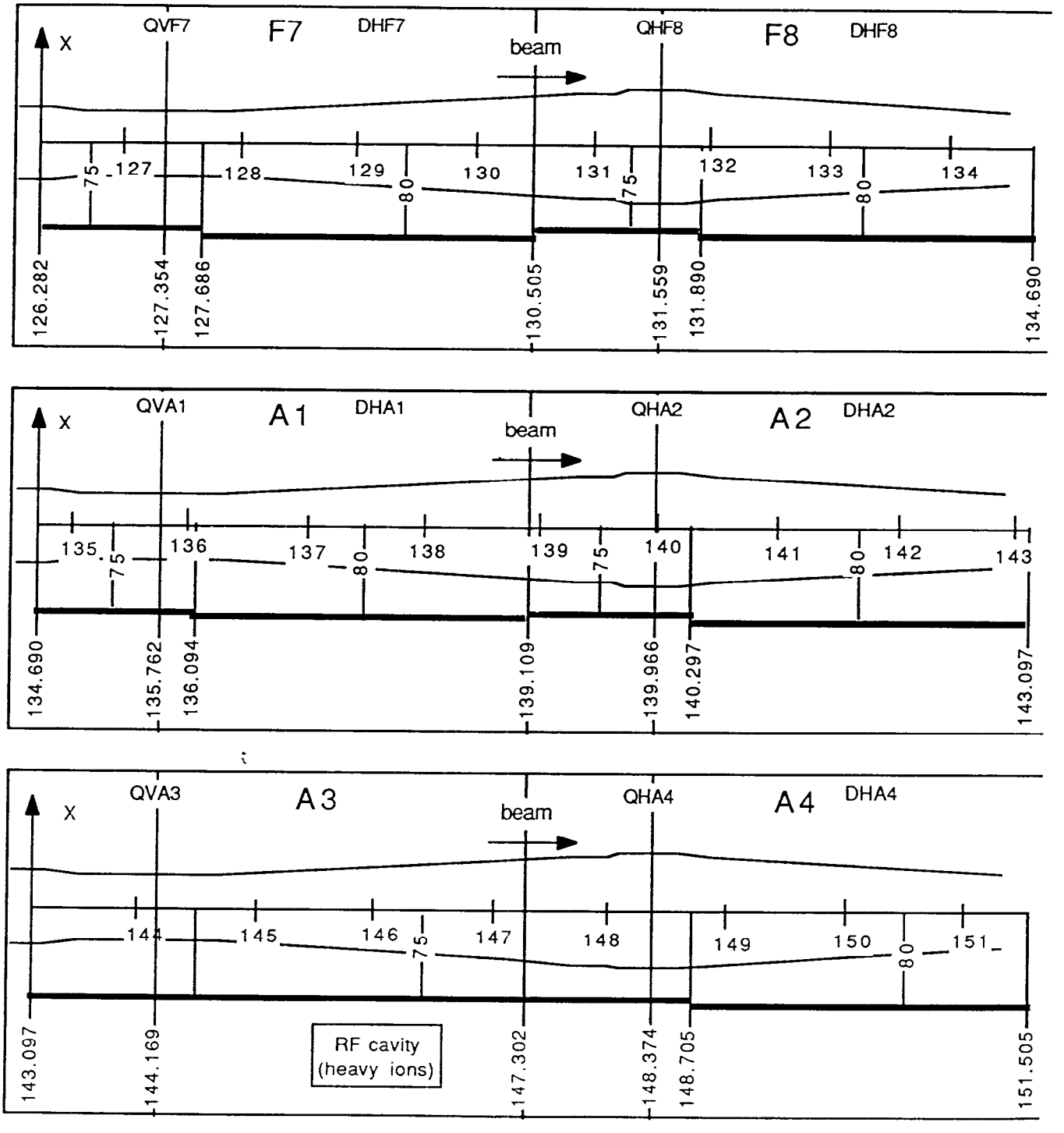

Fig.6. Horizontal aperture. F7 to A4.

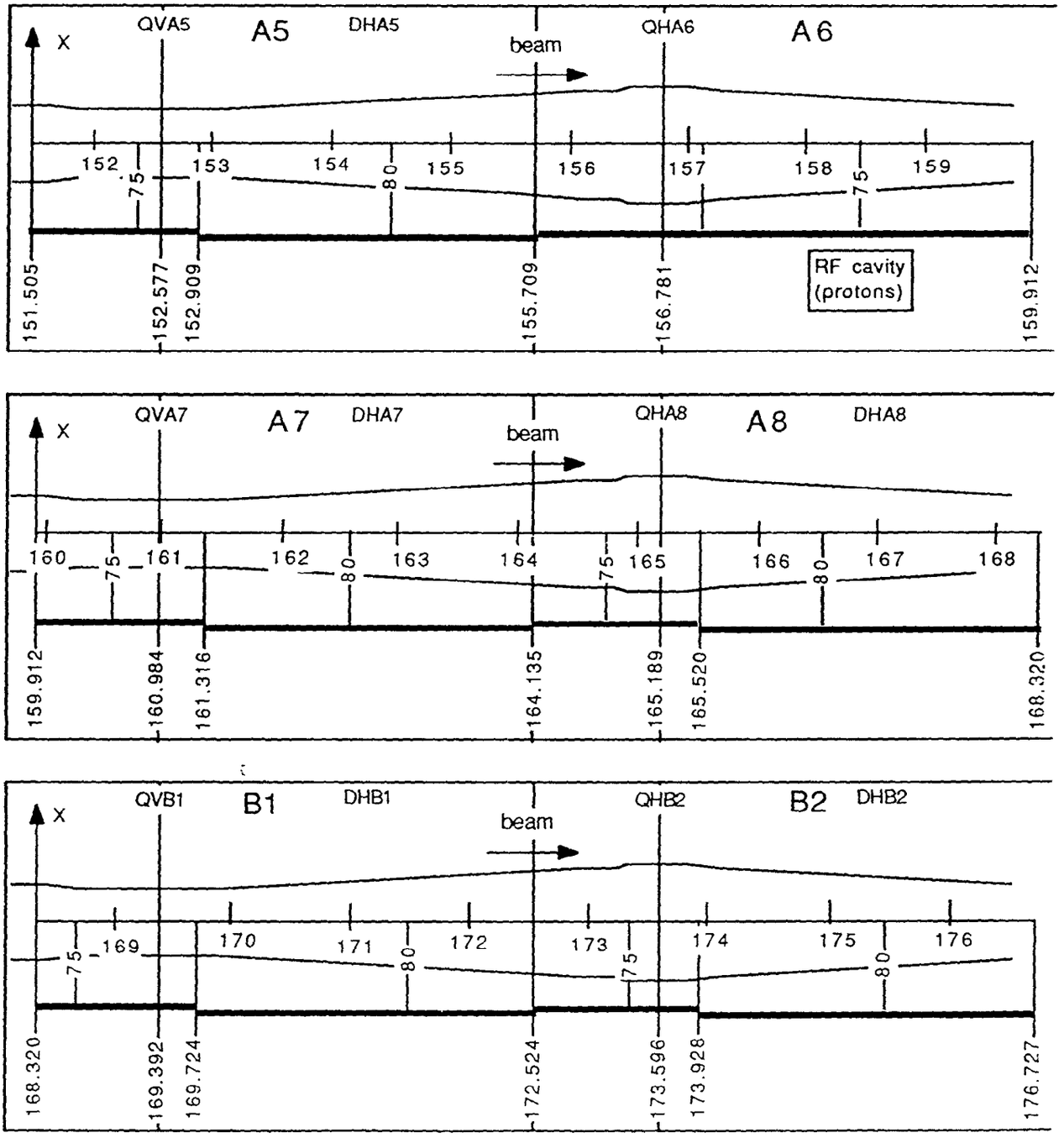

Fig.7. Horizontal aperture. A5 to B2.

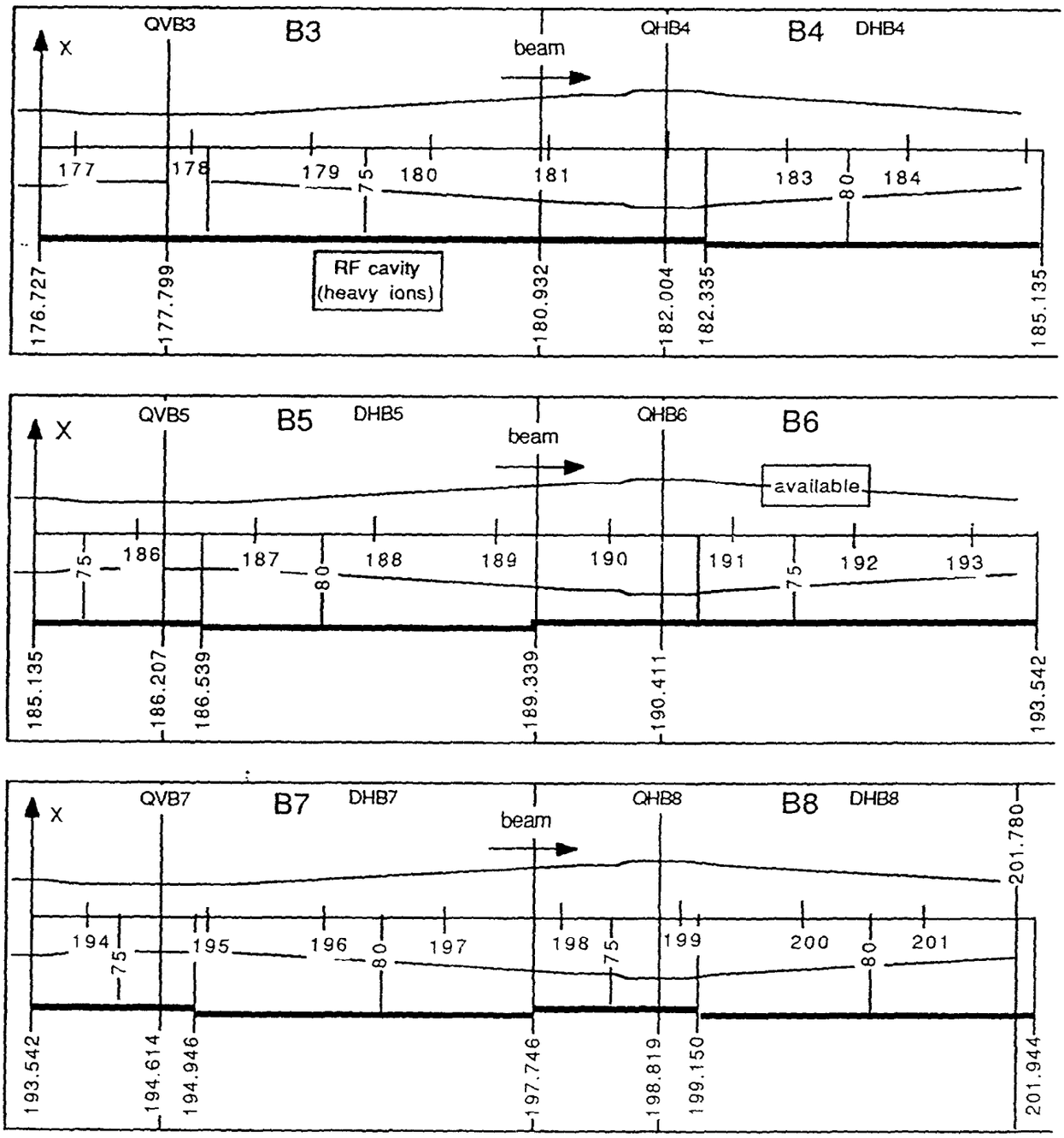

Fig.8. Horizontal aperture. B3 to B8.

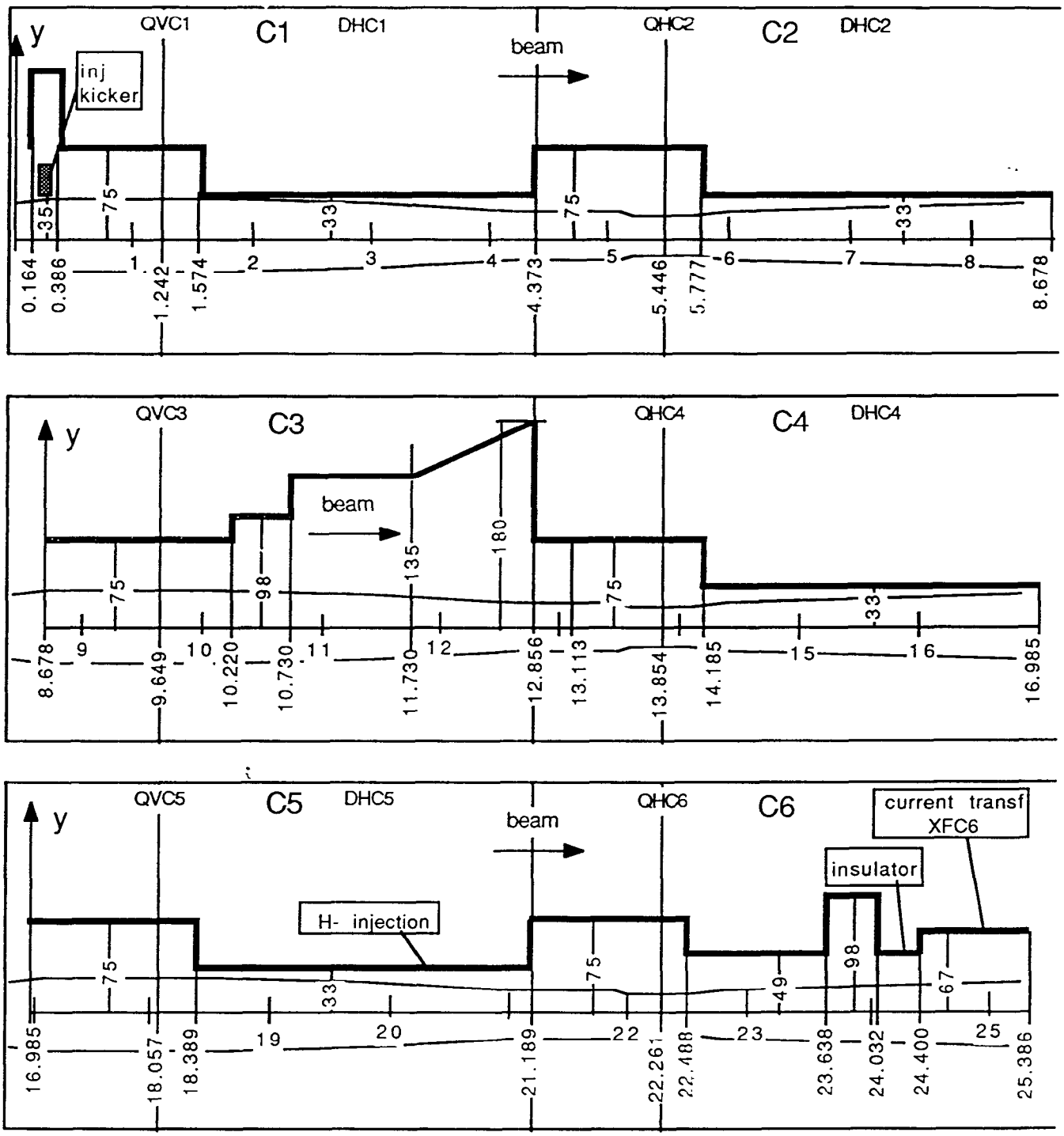

Fig.9. Vertical aperture. C1 to C6.

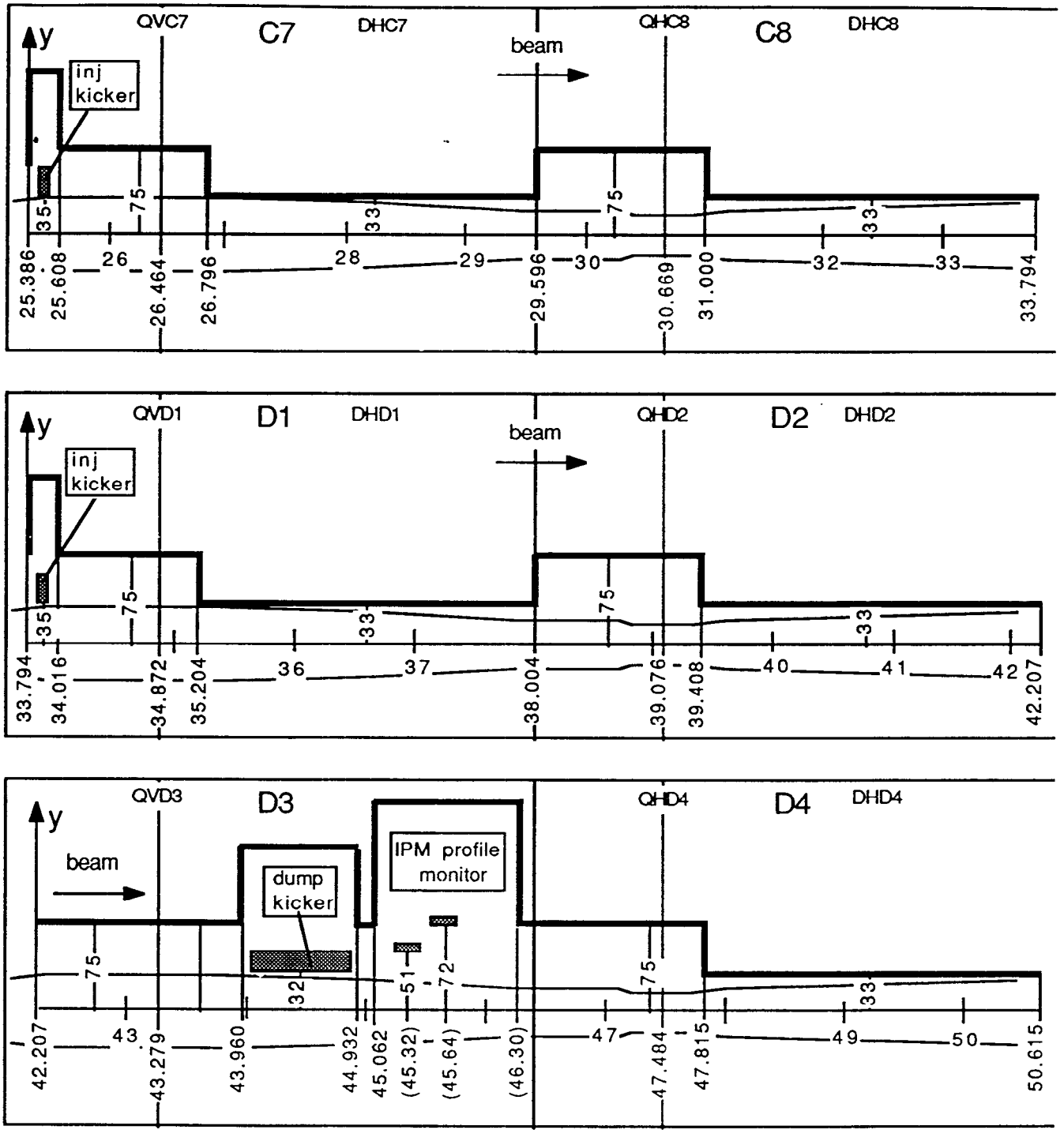

Fig.10. Vertical aperture. C7 to D4.

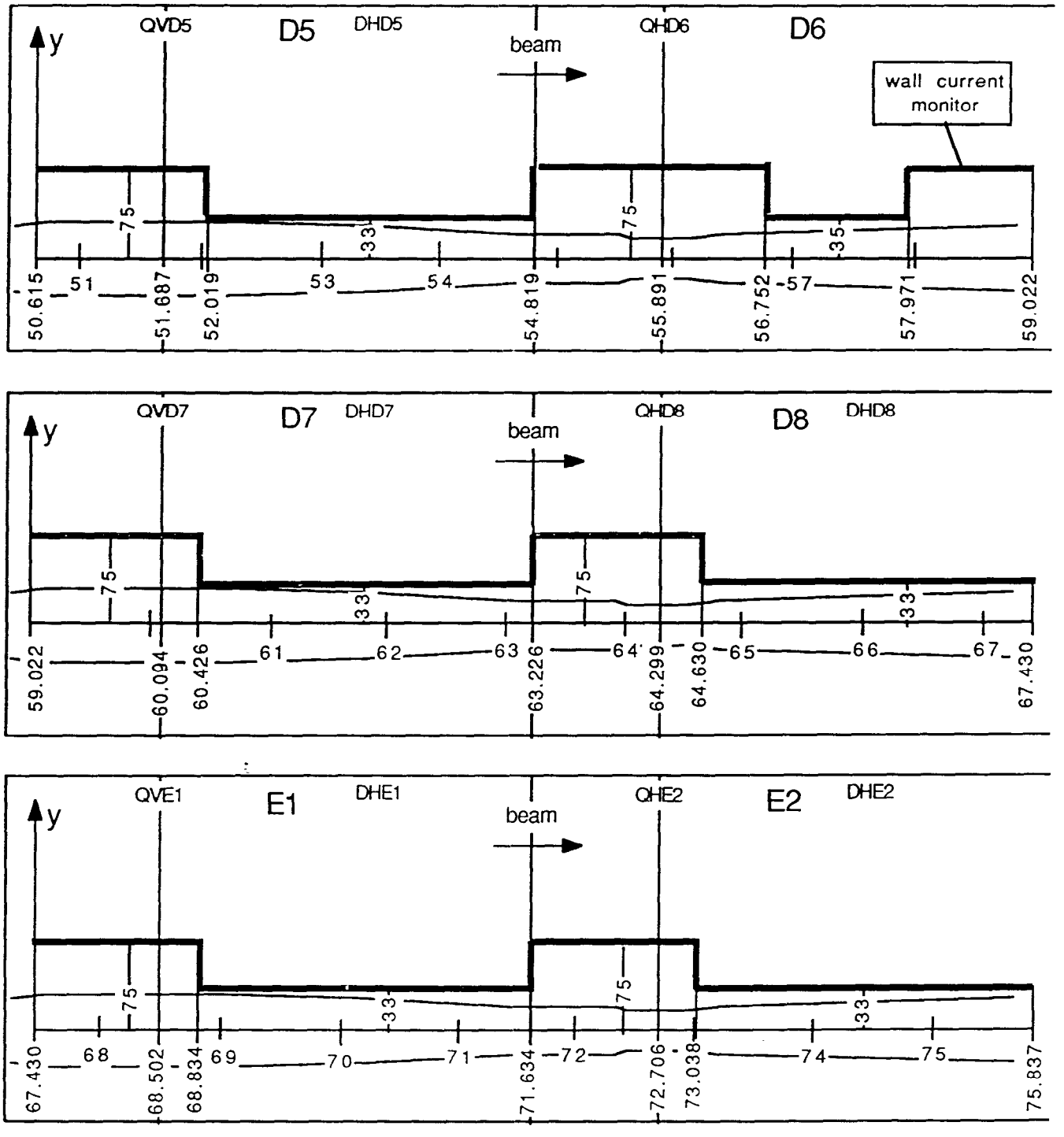

Fig.11. Vertical aperture. D5 to E2.

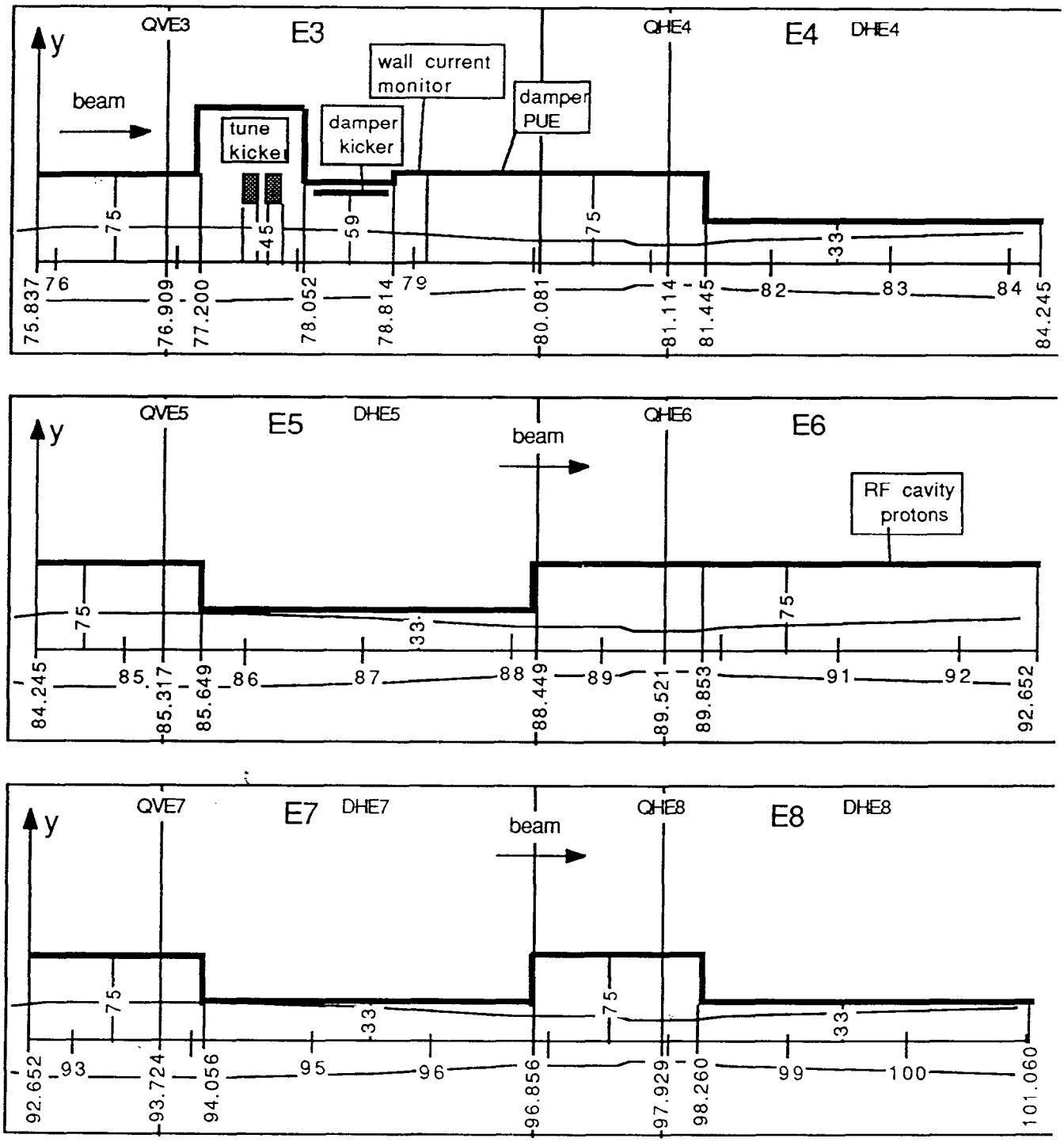

Fig.12. Vertical aperture. E3 to E8.

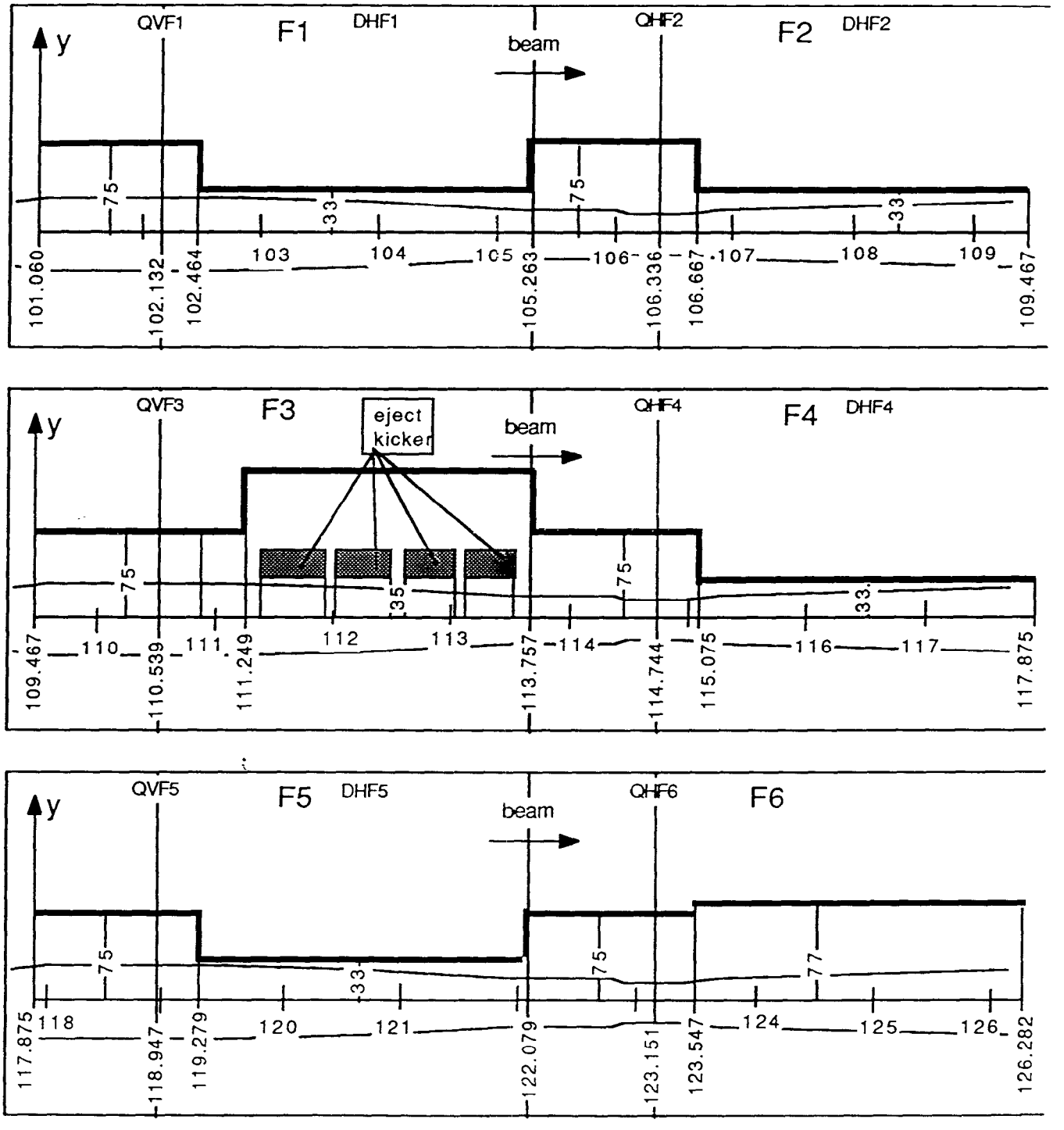

Fig.13. Vertical aperture. F1 to F6.

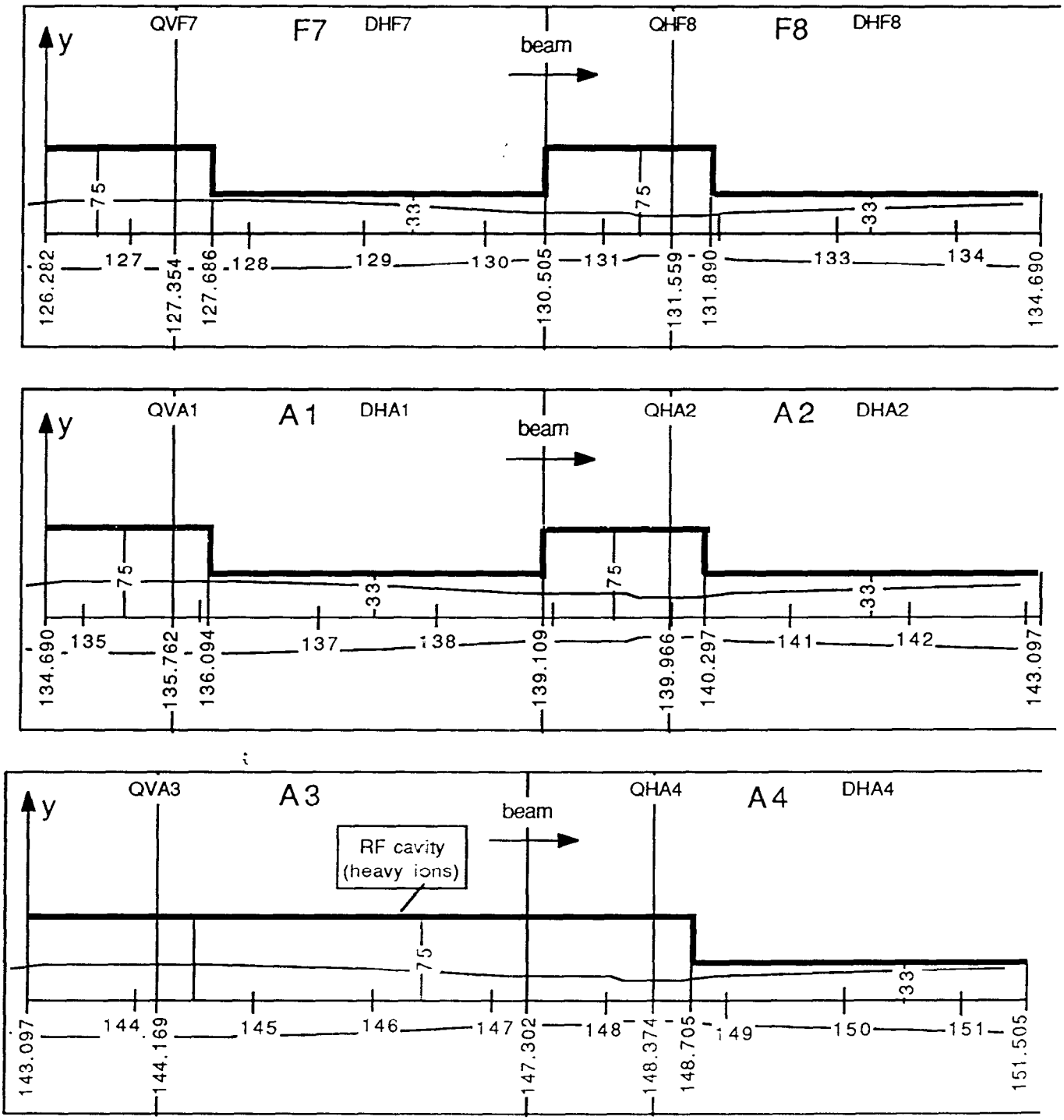

Fig.14. Vertical aperture. F7 to A4.

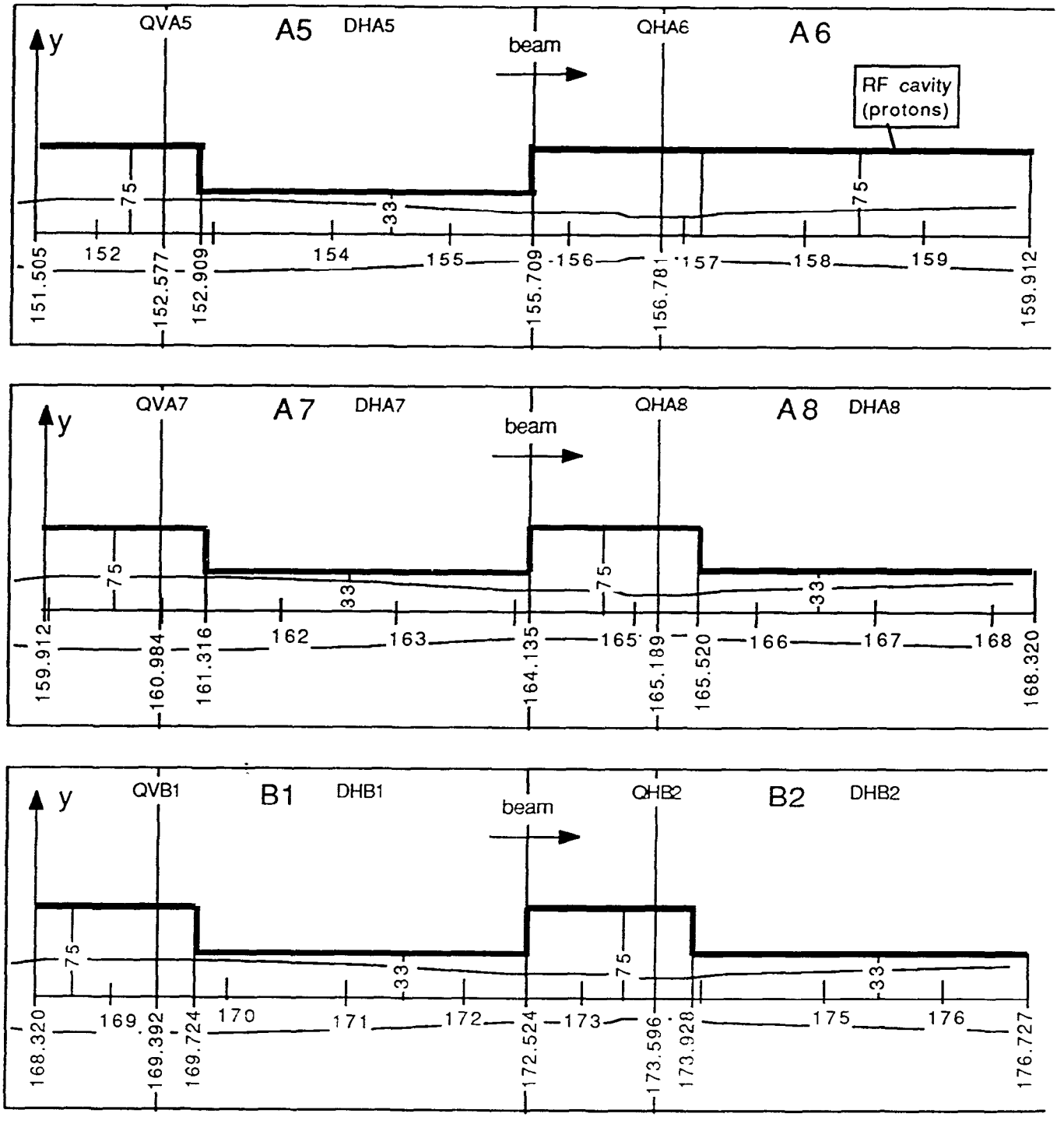

Fig.15. Vertical aperture. A5 to B2.

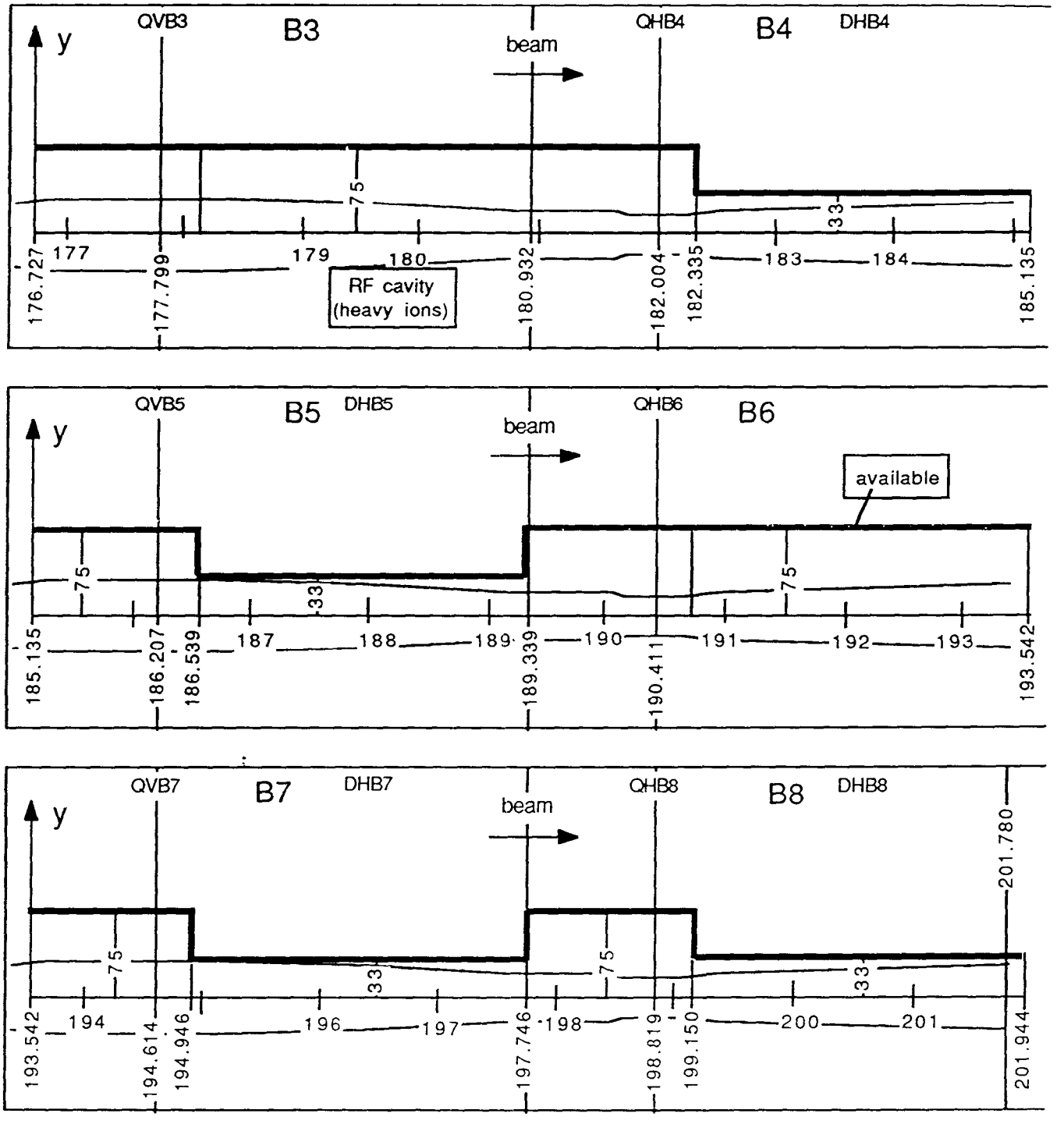

Fig.16. Vertical aperture, B3 to B8.

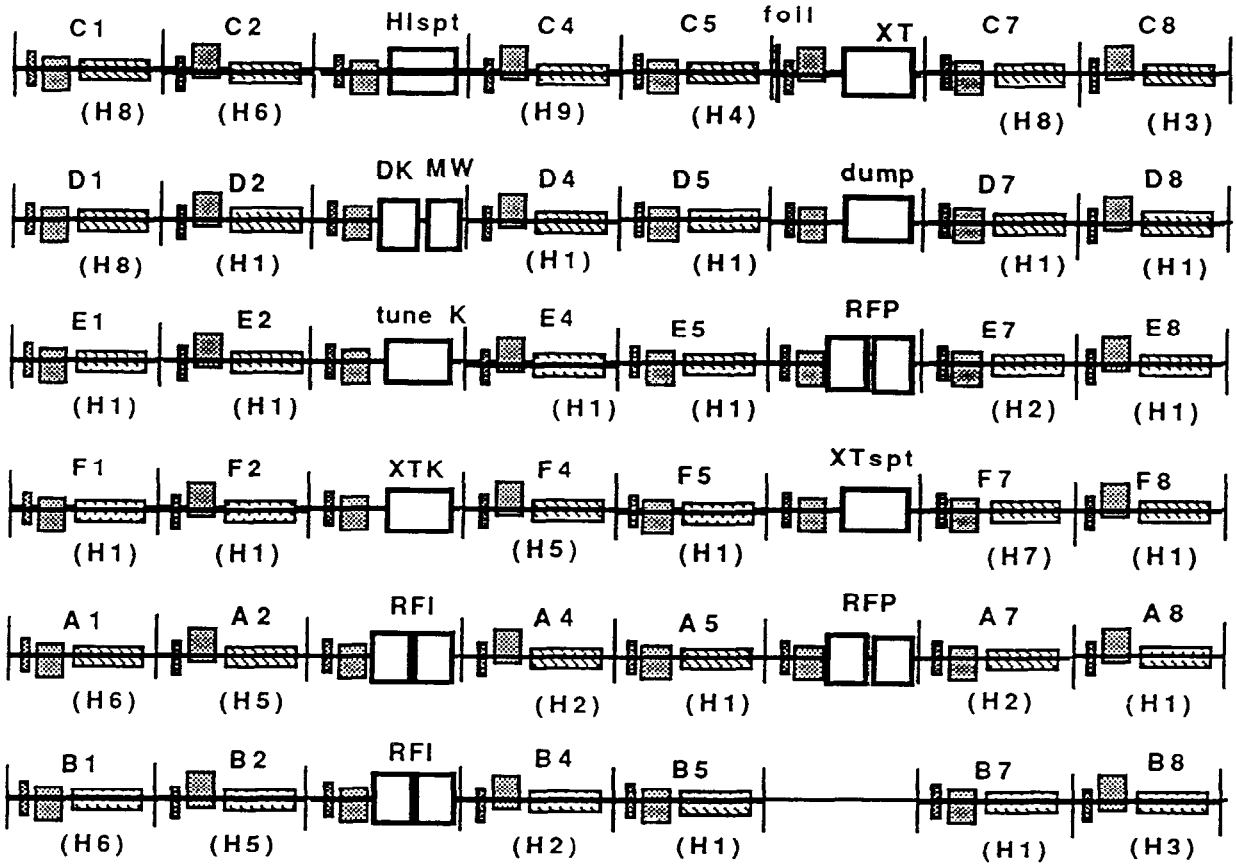

Fig.17. Booster arrangement. H1..H9 are the vacuum chamber sections "types".