This then becomes the primary and the next one is the secondary. A pulse forming network is used after the second core. We have to time the second core properly as energy is transferred since there is no diode on this stage.

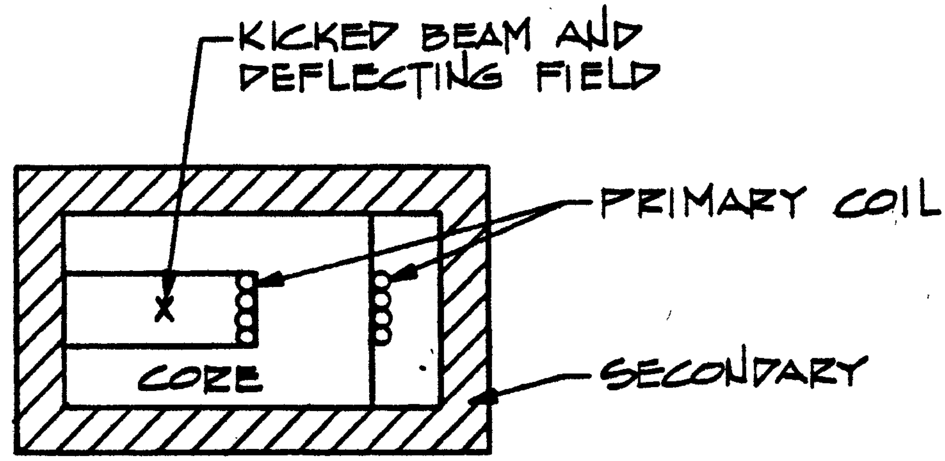
The plan is to use a five stage device and the delivery time is about six to nine months for a system to do what we want.

1. Questions

Isn't it hard to believe you can get ns accuracy? We expect typically 5 ns with overall jitter of 10 ns. The material is called Deltamax and is made by Arnold. They have been used for radar modulators. The cores for this design are about 9-inches diam by 3-inches wide.

C. Pulsed-Septum Magnet, M. H. Foss, ANL

A thin (¼-inch) pulsed (1 Tesla) septum magnet is used at the Argonne Rapid Cycling Synchrotron, but this magnet fails too soon. A good magnet should last 10^9 to 10^{10} pulses. We have tried to develop a better device which consists of a primary coil wound on a "C" core (as shown below).



If this structure were surrounded by a superconducting box then the desired deflecting field would be produced in the gap when the primary is pulsed. This suggests that a grounded conducting box will contain the stray field for a limited time. This box is the secondary. Electrical considerations are minimized in this design so that the mechanical problems can be given full consideration. Details are given in Ref. 1. The pulsed septum magnet is to be followed by a conventional dc magnet.

1. Questions

How do you constrain the primary? Fiberglass and epoxy are used. One could leave the core out of the primary and have zero force on the primary but it would take twice the power.

Do you presently have any beam loss on the system? Yes.

What is the PSR beam size at the septum? About 2-cm half width.

Could you increase the efficiency with a small-back yoke? A small-back yoke will be included in the box.

Reference

1. M. Foss, K. Thompson, and W. Praeg, "A Transformer Septum Magnet," paper J3 of 1979 Particle Accelerator Conference.

D. H^- Injection, Y. Cho, ANL

Let us consider the emittance of a linac and the acceptance of circular rings. For example IPNS II and SNS have acceptances of:

$$\left.\begin{aligned} \varepsilon_H &= 60 \text{ cm}\cdot\text{mr} \\ \varepsilon_V &= 50 \text{ cm}\cdot\text{mr} \end{aligned}\right\} \quad \text{SNS}$$

$$\left.\begin{aligned} \varepsilon_H &= 80 \text{ cm}\cdot\text{mr} \\ \varepsilon_V &= 40 \text{ cm}\cdot\text{mr} \end{aligned}\right\} \quad \text{IPNS-II}$$

Both machines take linac emittance, $\varepsilon_L \approx 1$ cm•mr. Therefore, in principle for IPNS II one can inject 80 x 40 = 3,200 turns, and for SNS 60 x 50 = 3,000 turns based on the acceptance consideration. However, IPNS II is designed to inject 500 turns, and 300 turns for 8 ns. Thus, there is disparity in the number of turns one can inject into the circular machine and number of turns one intends to inject. Even if one takes into account some factor of two dilution in emittance, there still is a large disparity in the possible number of turns one can inject and the intended number of turns. Thus we have to consider how we are going to inject.