

Friday 29 March 1996

K. Reece

*KRR*

Minutes of meeting: Radiation Safety Committee, sub-committee

Date: Thursday 21 March 1996

Present: P. Carolan, J. Geller, W. MacKay, S. Musolino, D. Passarello, K. Reece, G. Smith,  
R. Thorn.

Subject: BTA co-injection current transformer.

This meeting was a continuation of a presentation by G. Smith concerning the original design of the co-injection current transformer system from an RSC meeting of 13 March 1996. Included were a review of the failure modes of the "old" design (attachment 1) and some discussion of the needed changes to this system for our present view of this device. The "new" view of operation emphasized the fact that AGS SEB high intensity will be the predominant User while the FEB User for ATR and RHIC will be interleaved in a PPM manner.

At the close of the meeting, a proposal was made (attachment 2) concerning the integration of this device for use with the AGS, (K. Reece). Due to time, detailed discussion was postponed until the next meeting.

cc: RSC (w/attachment 2)  
RSC file (w/attachment 1&2)

attachment 1

**The sole function of the Co-injection System is to cause a security system fault when the beam intensity at the detector location has exceeded a predetermined maximum level.**

original def<sup>n</sup>.

**Conditions which will cause a trip condition are:**

**Primary raison d'etre**

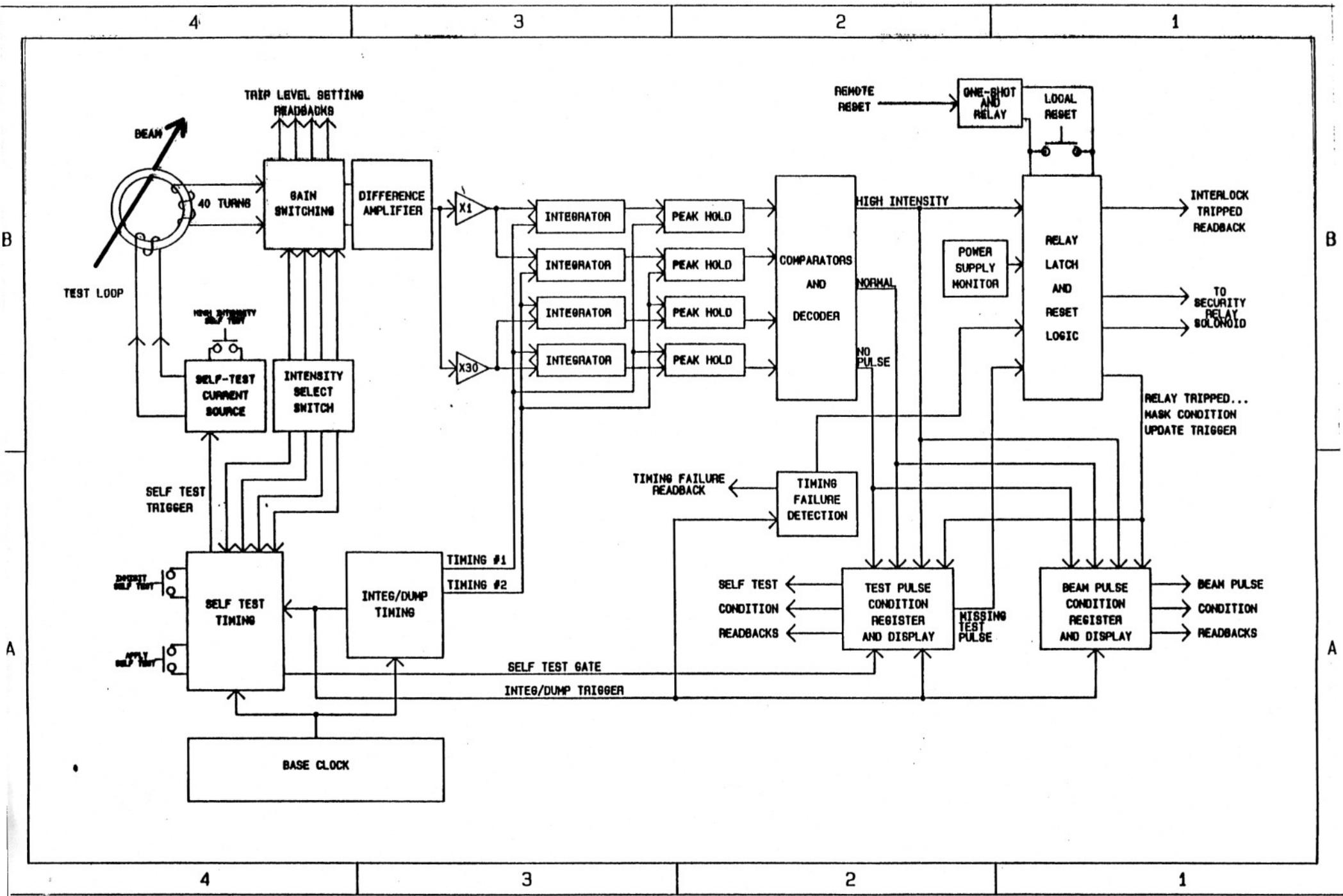
- Detection of a beam pulse which exceeds a preset level in intensity.

**Needed to insure fail-safe requirement**

- Detection of a self test pulse which exceeds a preset level in intensity.
- Failure to detect a self test pulse every 5 msec.
- Failure of either (or both) integrator timing cycles
- Failure of both +15 Volt supplies or both -15 Volt supplies or the +5 Volt supply.

- Selection of Intensity threshold is by slide switch on PC card. LED's and Remote readout
- When set up, system must be started by local or remote reset
- System runs (asynchronously) until a trip occurs. System stops and holds conditions at time of trip. High, Norm, None Beam Intensity and High, Norm None Self-test Status.
- System must be started again either by local or remote reset.

original def<sup>n</sup>.



## attachment 2

Wednesday 20 March 1996

K. Reece

### Thoughts on the use of the co-injection current transformer.

- system must be defined as low = no enable, (failsafe).
- AGS facility is to operate in a PPM/Context switching manner.
- mode of operation of primary concern is high intensity proton operation for SEB interleaved with low intensity proton cycles for RHIC use.
- not addressed at present is g-2 operation interleaved with RHIC, (although the additional interlock logic to permit this mode has been considered).
- system will only provide an enable for FEB extraction devices.
- enable occurs when system senses beam current amplitude  $<$  high limit.
- enable "holds" until high intensity pulse ( $>$  high limit) removes enable, (and/or after a fixed delay timeout).
- function of system enable is to allow FEB G-10 kicker and H-10 septum magnets capacitor banks power supplies to begin charging.
- FEB extraction only occurs with the AND of the co-injection system enable and the machine controls system FEB request (e.g. begin charging, etc.).
- since this system cycles frequently between  $>$  threshold and  $<$  threshold, mechanical devices such as relays should be avoided.