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BEAM DIAGNOSTICS IMPLICATIONS FOR LEIR

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This document shows in a simplified tabular form the currently (Sept. 2001) known requirements for the Low Energy Ion Ring (LEIR) and preliminary ideas on beam diagnostics systems, together with possible names of persons implicated. It is a working document prepared for that purpose only.

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Beam Diagnostics Implications for LEIR

(Basic Assumption: we move to standard VME based systems, 3.6 s cycle with PS/PSB type controls architecture to permit re-usage of existing technology and in some cases, identical systems from AD)

<i>Measurement System or Device type</i>	<i>Proposal for solution</i>	<i>REALIZATION constraints & conditions</i>	<i>Persons Implicated</i>
Closed Orbit System	"Normaliser" solution style PSB, AA,AC etc; 32 pickups Exist but would need new AD style amplifiers	MPV908 VME ADC & hence get all interface hardware/ specific software & Application as copy of existing, similar systems	L.Soby (+) + specific controls hardware & software copy persons
Position PickUps for Electron Cooling	2 (H+V) need to be produced - copy of AD electron cooling pickups	Electronic chain & connection to 'normaliser' style solution as above	L.Soby(+)
Position Pickups in LEIR to PS line	7(H+V) required but some were removed to AD so need some new electrostatic pickups construction	can we envisage interfacing with LPI style ADC[MPV908] and PICKUP-V - then rt task aspects are a 'copy' solution. Else use 'Transceiver solution' (style-J.Belleman) as for ex-Schneider in TT2 , TTL2,EJ58 to replace old interface & CAMAC chain? Again, interfac+controls become a 'copy' solution	L.Soby(+), J.Belleman? (with L.Merard+++?)

<i>Measurement System or Device type</i>	<i>Proposal for solution</i>	<i>REALIZATION constraints & conditions</i>	<i>Persons Implicated</i>
Circulating Beam Current Measurement	DC BCT	Major refurbishing of existing device with magnetic shielding, temperature stability not needed like LEAR 'cause 3.6 s cycle, newer electronics & interfacing etc hence, copy of PS standard hardware & software , Sampler applic every 1 ms etc; (ensure MPV908 in same DSC as Scrapers interface for Transv profiles)	P Odier (+)
Beam Transfer Transformers	<p>L3 to LEIR (long , linac type pulse) propose existing:</p> <ol style="list-style-type: none"> E2.MTR02 install E3.XXX (ex-E2.MTR03) <p>LEIR to PS propose existing :</p> <ul style="list-style-type: none"> E2.MTR04 E1.MTR00 (before PS Inj septum in section 26) E1.MTR-01 	<ol style="list-style-type: none"> Recuperate spare electronics chain PSB Inj (LTB.TR49) & connect to L3 DSC system STR751/755) Eq.no 7007 ? recuperate E2.MTR04 electronics & interface(Eq no 7041, STR751/755, DSC - DLN3TRA1 <ul style="list-style-type: none"> For all these 3 'fast' transformers, adopt standard PS technique of S/H, integrator, MPV908 & TRAFO , style C.Carter 	<p>F Lenardon(+)</p> <p>F. Lenardon+ (C Carter in preparatory phase) + L Merard (preparatory phase?)+etc</p>
Intermediate Injection Transformer	A possible way to observe 80-100 multiturn inj with < 1% droop has been found (Odier+Lenardon) using recuperated trafo ex- E5.MTR01 to install in LEIR ring	No Computer Acq required - only analogue NAOS output	Odier+Lenardon +

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Tune Measurement	<p>For complete system both bunched(on ramp) and unbunched beams(on plateaux) a single system - with direct schottky because of sufficient intensity or 'style AD' with BTF technique if necessary (fixed freq on plateaux and M-shaped tickling on ramps - style O.Marqversen) with DRX etc can do the job for qh, qv every ~20 ms . [Would make existing old q-kicker & 1 turn pulser +FFT etc redundant]</p> <p>Partial alternative using BTF is valid only for plateaux unbunched beam with BTF technique where again AD commissioning approach with HP3577A network analyser can be applied if 'pauses' permitted by cycle editor etc</p>	<p>Purchase of DRX + ADC etc (~30KCHF) and fabrication of other rf hardware (clock, freq synch etc) style F.Pedersen + beam excitation hardware (if required like AD) etc..and using existing pickup for signal</p> <p>Kicker deflector & pickup exist from LEAR for this partial alternative, a copy from AD of interface hardware & software + applic. feasible but still need to purchase HP3577A 200 MHz network analyser</p>	<p>M Angoletta(++..), M.Ludwig etc.. + rf [+blowup interfacing IF REQUIRED (A Findlay, O. Marqversen, F Pedersen)</p> <p>L.Bojtar+++++,L.Soby (?) +</p>
MTV Screens for Observation	Use existing stations	Refurbish/renovate & interface to standard PS controls & copy as & where necessary.	Section U Raich ++
Tansverse Feedback System	LEIR Requirements need substantial work and new development but partial recuperation from existing system feasible	Refurbishing, new PU+kicker development , copy of amplifier type style PSB/AD etc	L.Soby(+)