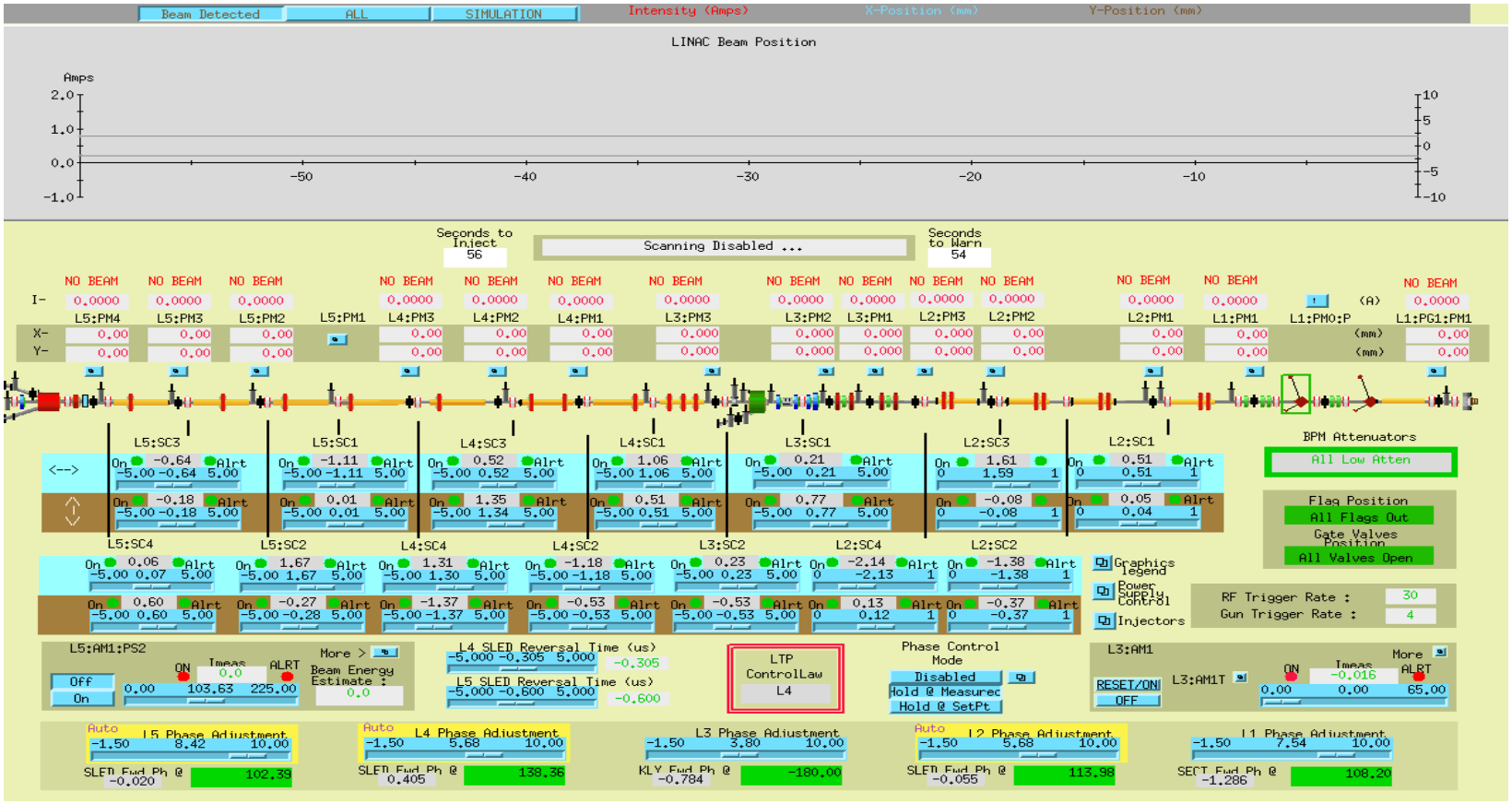
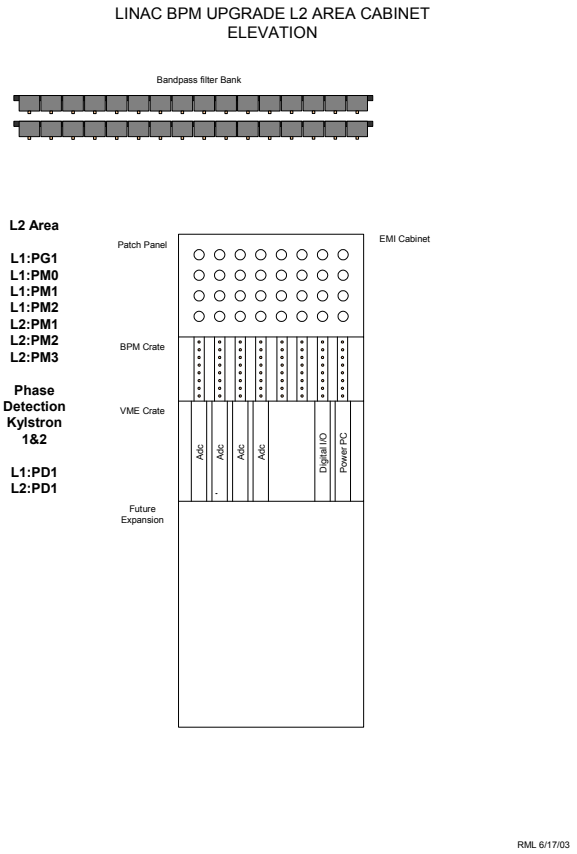
LINAC, LTP, PAR/BOOSTER BYPASS BPM UPGRADES

Bob Lill 10/23/03

LINAC Locations



LINAC L2 Cabinet Elevation



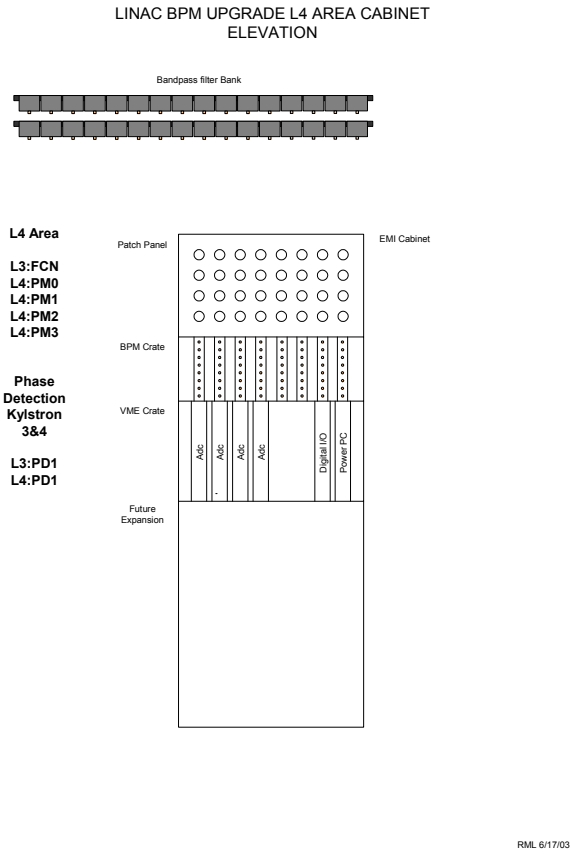
LINAC L2 AREA

- BPMs
- L1:PG:PM1
- L1:PM0
- L1:PM1
- L1:PM2 (NEW)
- L2:PM1
- L2:PM2 (NEW)
- L2:PM3 renamed
- L2:PM4 B.C. renamed

Phase Detectors

- L1:PD1
- L2:PD2

LINAC L4 Cabinet Elevation

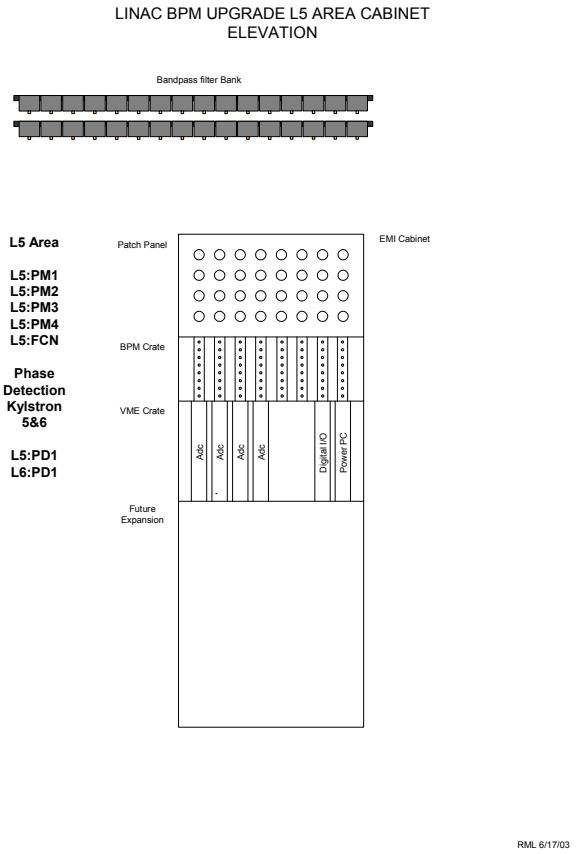


LINAC L4 AREA

- BPMs
- L3:FCN
- L3:PM0 (NEW)
- L4:PM1
- L4:PM2
- L4:PM3

- Phase Detectors
- L3:PD1
- L4:PD2

LINAC L5 Cabinet Elevation

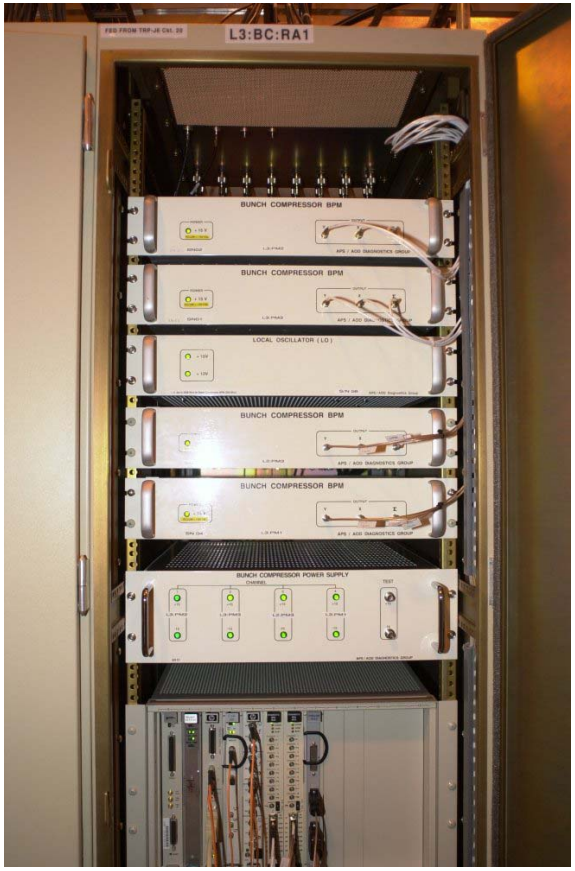


LINAC L5 AREA

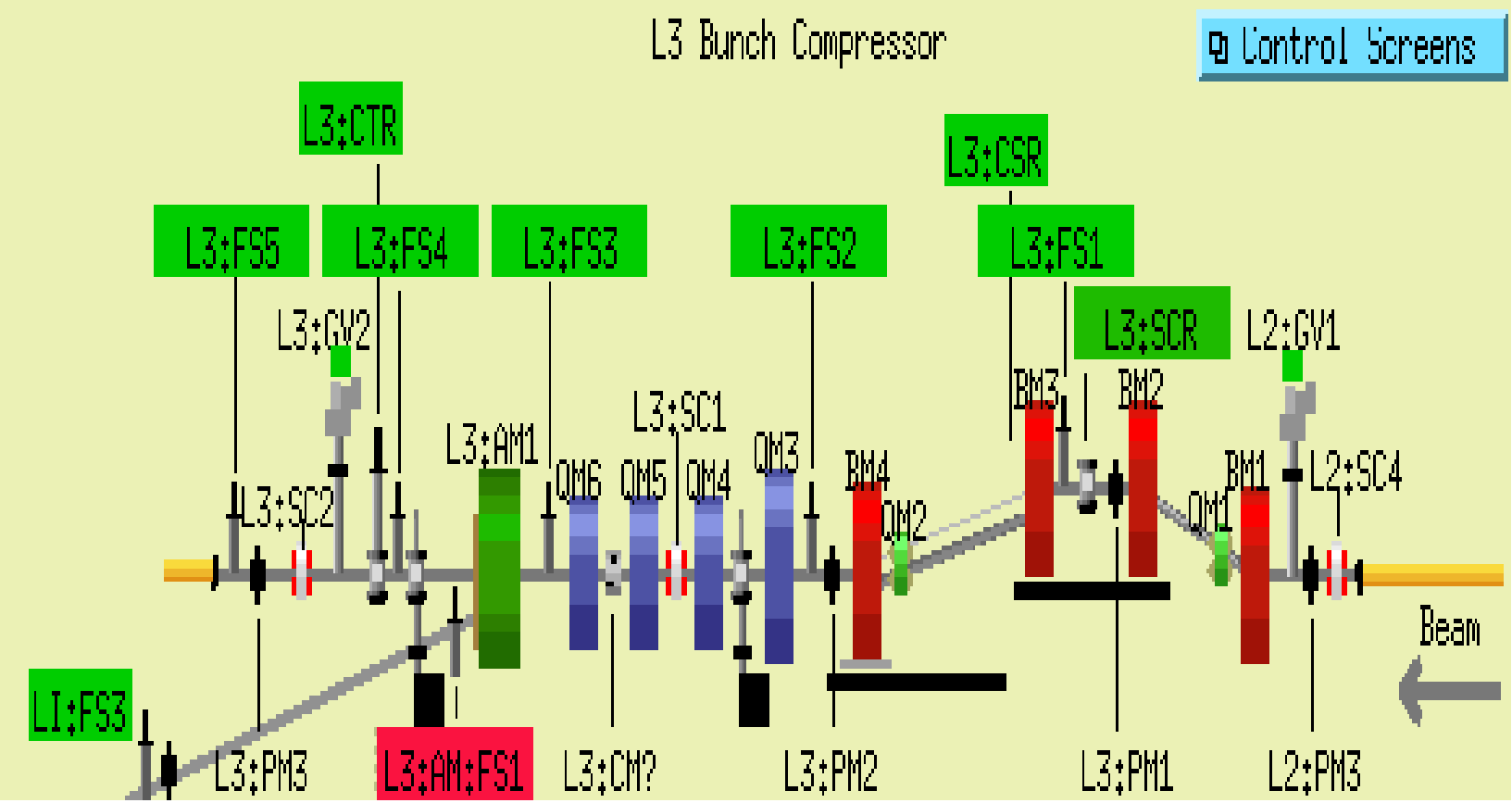
- BPMs
- L5:PM1 (NEW)
- L5:PM2
- L5:PM3
- L5:PM4
- L5:FCN

- Phase Detectors
- L5:PD1
- L6:PD2

Bunch Compressor BPMs



LINAC Locations



Bunch Compressor Area

- BPMs
- L2:PM4 (renamed)
- L3:PM1
- L3:PM2
- L3:PM3

- Sum, Delta X, delta Y
- +/- 5 volt output
- 50 ohm

Linac General Controls Requirements

- ADC timing signal with < 10 ns jitter.
- Processing data at 30 Hz rate.
- Control and Status I/O for self test and gain selection.
- ADC input range +/- 1 volt with a 50 Ω input impedance.
- 4 New VME crate and Processor MVME5100-0133 installations.

Phase Detector Controls Requirements

- 2 ADC channels per phase detector.
- ADC input range +/- 1 volt with a 50 Ω input impedance.
- ADC timing signal with < 10 ns jitter.
- Processing data at 30 Hz rate.
- Control and Status I/O for self test and gain selection.

LTP BPM UPGRADE

- LTP:PH4, LTP:PV4
- LTP:PH3, LTP:PV3
- LTP:PH2, LTP:PV2
- LTP:PH1, LTP:PV1

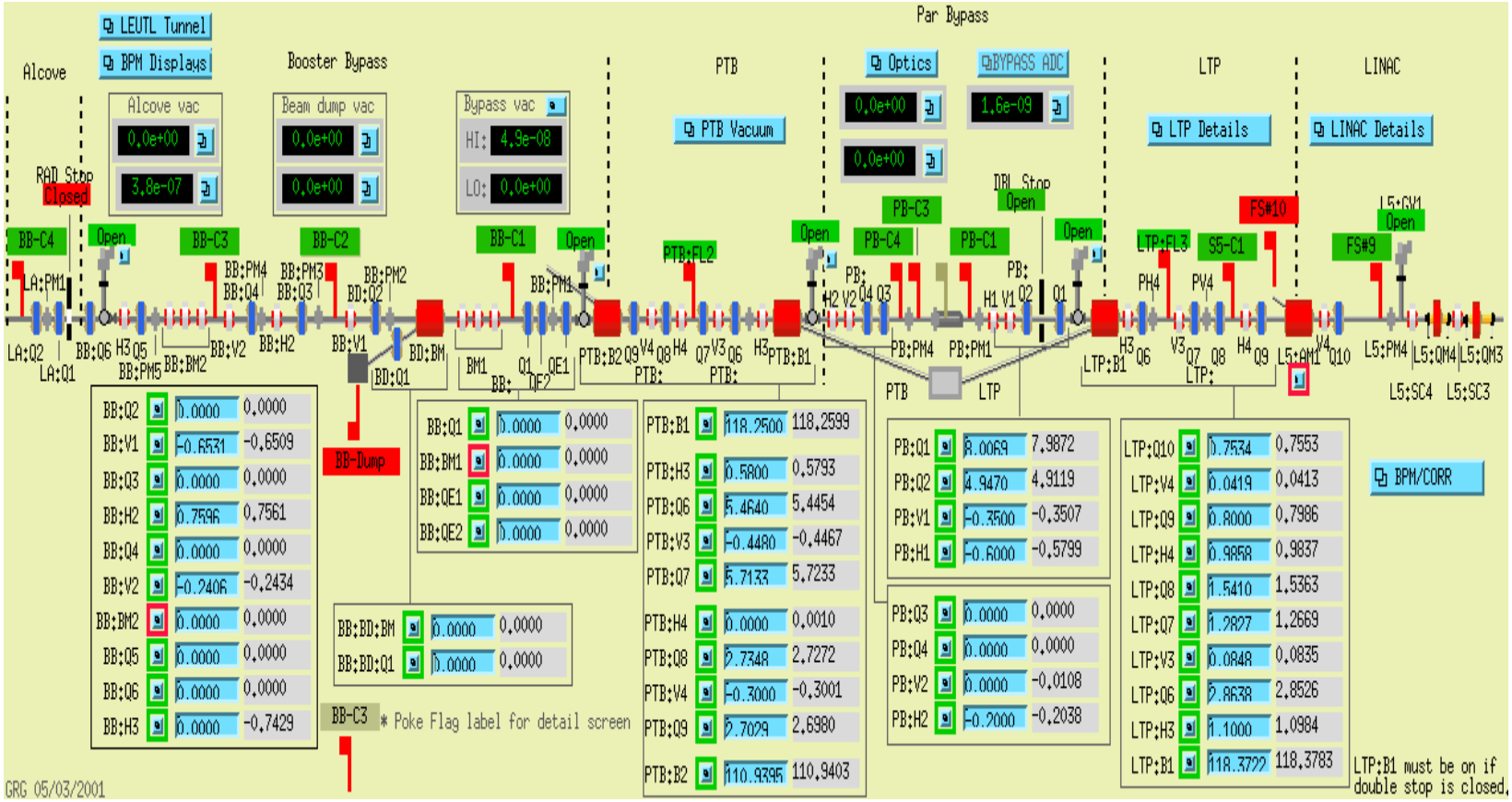
LTP Cabinet

MIXER - AMPLIFIER
MIXER - AMPLIFIER
LOCAL OSCILLATOR
CH 1
CH 2
CAUTION !

LTP General Controls Requirements

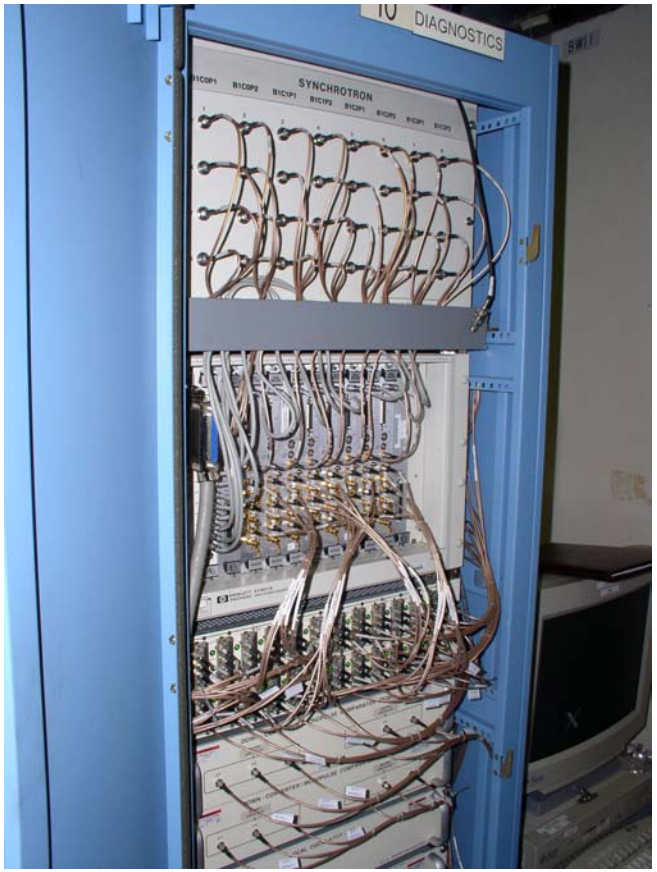
- 2-ADC SIS 3301 cards
- ADC timing signal with < 10 ns *jitter*.
- Processing data at 30 Hz rate.
- Control and Status I/O for self test and gain selection.
- ADC input range +/- 1 volt with a 50 Ω input impedance.
- 1 New VME crate and Processor MVME5100-0133 installations.

PAR&Booster Bypass, Alcove BPM Locations



PAR&Booster Bypass, Alcove

- PB:PM1, PB:PM4
- BB:PM1, BB:PM2
- BB:PM3, BB:PM4
- BB:PM5
- LA:PM1



Bypass Line General Controls Requirements

- 4-ADC SIS 3301 cards
- ADC timing signal with < 10 ns *jitter*.
- Processing data at 30 Hz rate.
- Control and Status I/O for self test and gain selection.
- ADC input range +/- 1 volt with a 50 Ω input impedance.
- 1 New VME crate and Processor MVME5100-0133 installations.

Design Specification

Parameter	PC GUN	RF GUN
Dynamic range	0.1 – 2 nC	0.1 – 10 nC
S.S. resolution	15 μm rms	100 μm rms
Drift	15 μm rms	100 μm rms
Bunch length	< 5 ps	< 5 ps
Macropulse length	1 S-band bunch	2 - > 20 ns
Position range	± 5 mm	± 5 mm

Schedule Milestones

- Commission PTB S-BAND BPM
  10/2003
- Install prototype Linac BPMs in L2 location
  11/2003
- Install PAR and Booster Bypass BPMs
  1/2004
- Complete Linac and LTP installations
  9/2004

Summary

- 15 New Linac S-Band BPMs plus ADC upgrade for 4 bunch compressor, Prototype Jan. 2004
- 6 New Linac Phase Detectors
- 2 New PTB S-Band Direct Injection BPMs, Sept.2003
- 4 New LTP S-Band BPMs
- 8 New Bypass Line S-Band, Jan. 2004