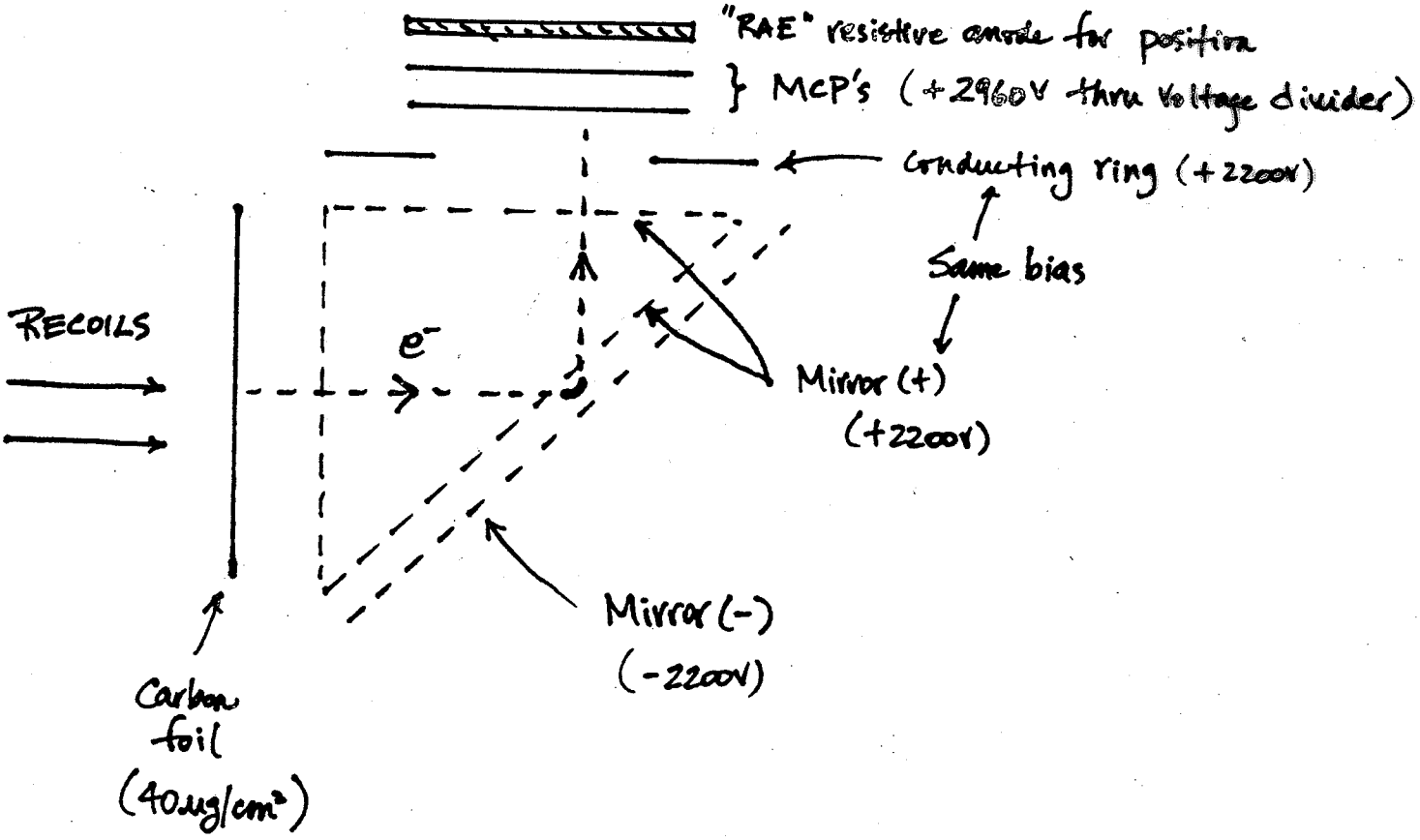
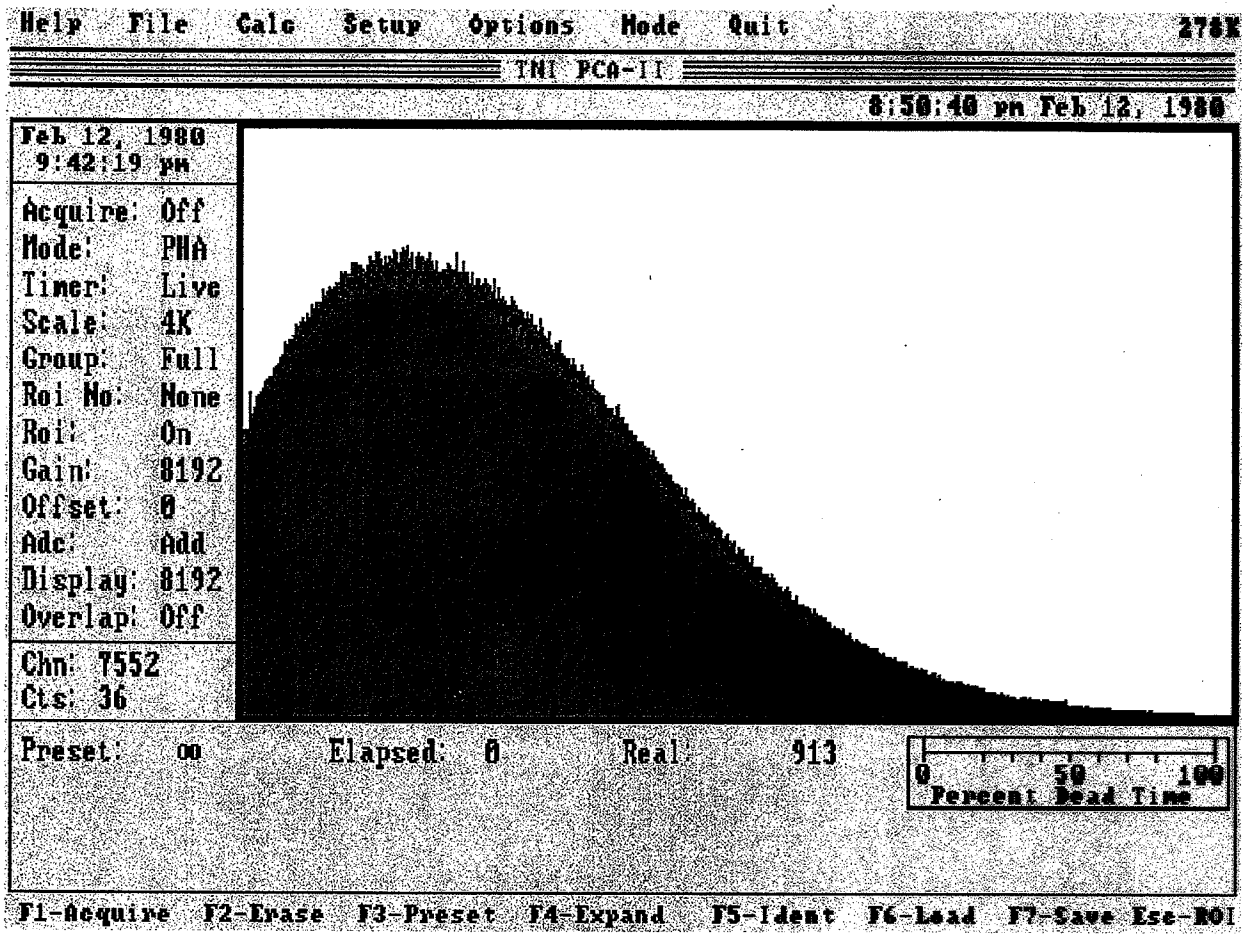
The Microchannel Plate Detector

Detector Schematic:





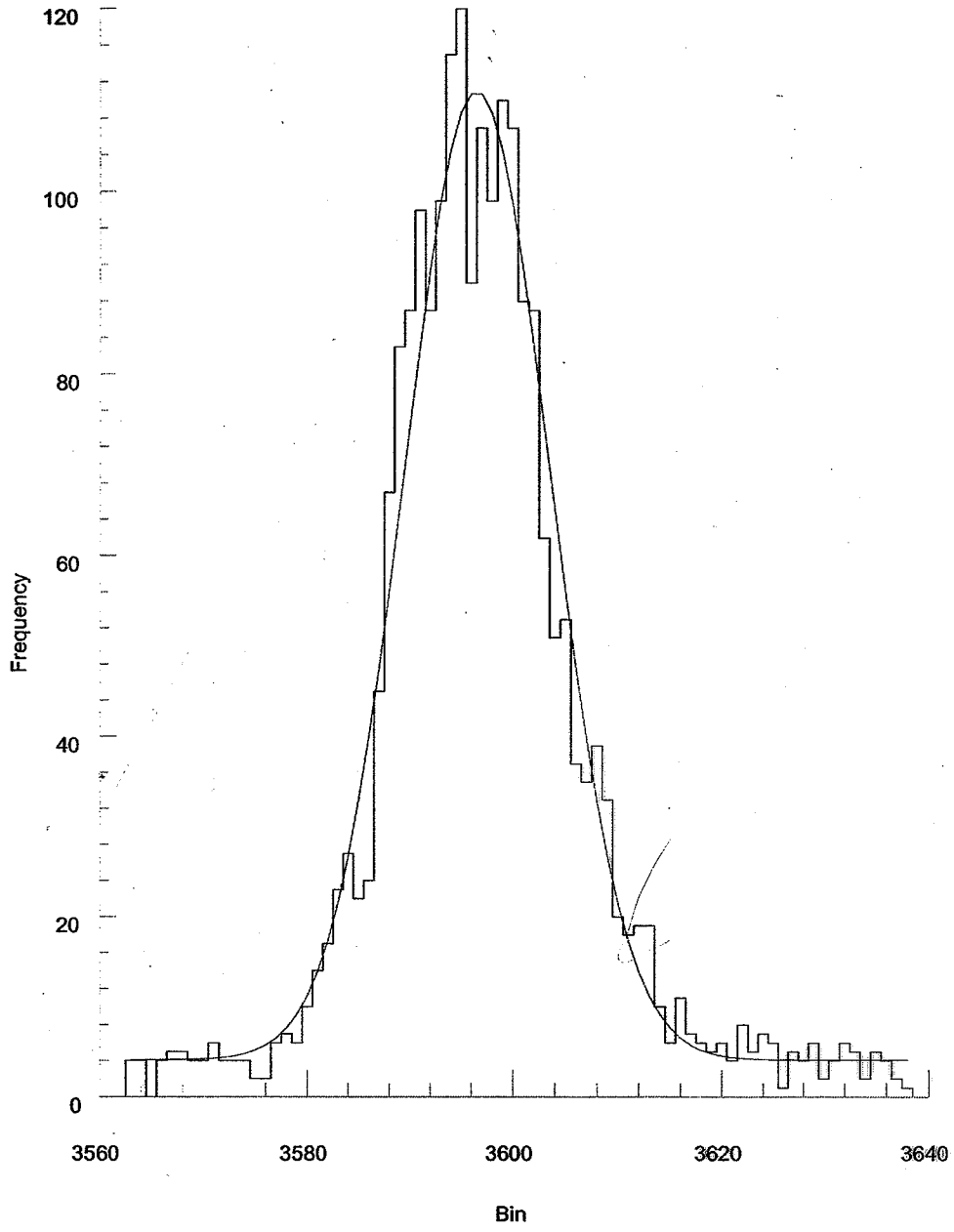
- Summed pulse height distribution of RAE signals

→ used as a second test to ensure mcp working well.

- ~~Spectra~~
- Can also be used to test charge levels on the RAE, will do this w/ the pulser. (used to set proper bias!).

(To test amplification then deduce charge)

MCP-PMT2 coincidence spectra



Now I get :

$\sigma_{MCP} \sim 150$ ps

$\sigma_{PMT1} \sim 140$ ps

$\sigma_{PMT2} \sim 300$ ps

Tests for MCP

- 2 masks in machine shop.
  a) 1 optimized for position resolution
     → 4 different size holes
     (4mm, 2mm, 1mm, 0.5mm diameters)
     → non symmetric mask
  b) optimized to test the positional efficiency and the linearity of position signals.
     → grid of 1mm diameter holes 3mm center-to-center spacing.

- PMT designed to sit in place of DSSSD box will be used with alphas to test mirror and MCP timing.
  → SRIM suggests straggling due to 20 ug/cm² foil negligable.
  → previous scint/PMT gave 475 ps (FWHM)

Tests for MCP ctd'

- Simulation done by Larry Root in relax 3d, plus his own transport program.
  - → Can be used to simulate above tests.
  - → Need to do 20um wires