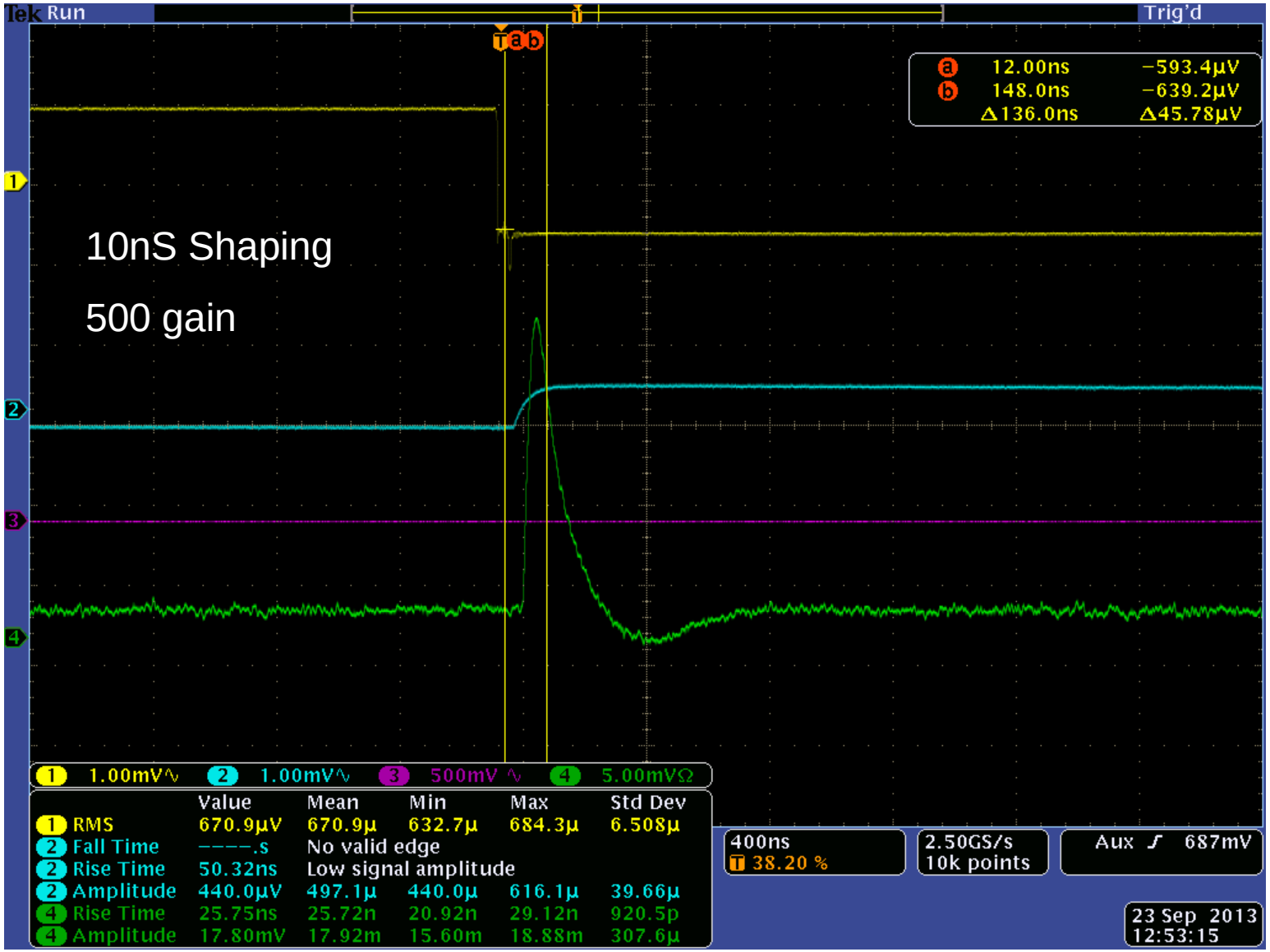
electronics update

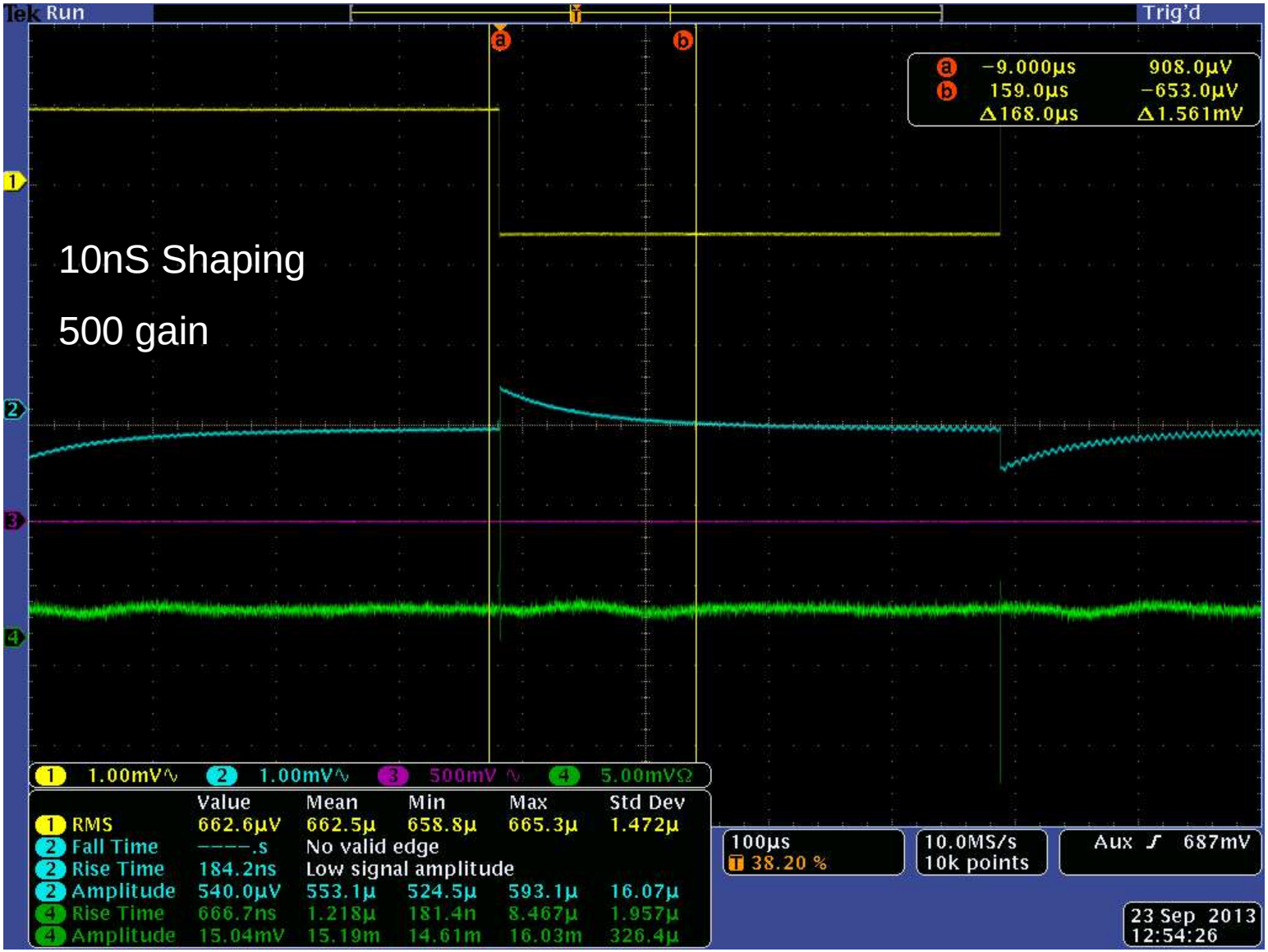
reproducibility

- Board has to be CLEAN and DRY
- Now have 4 preamps and 4 boards
  - all preamps behaving nominally
- Protection circuitry
  - checked resistance to ground and to rails
  - one diode seems to be installed in reverse, removed it
- finally seem to have gremlins tamed

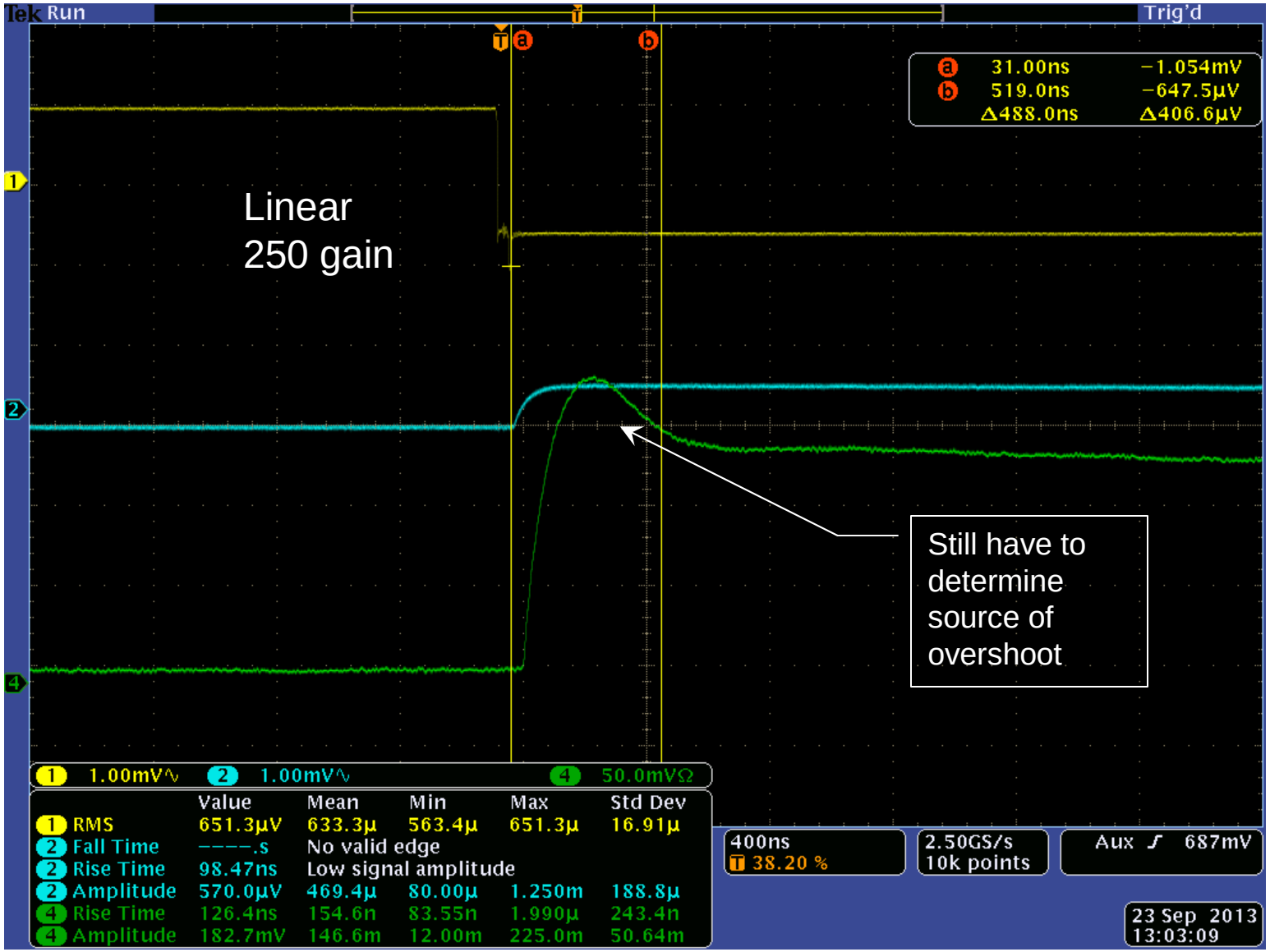
Current Preamp



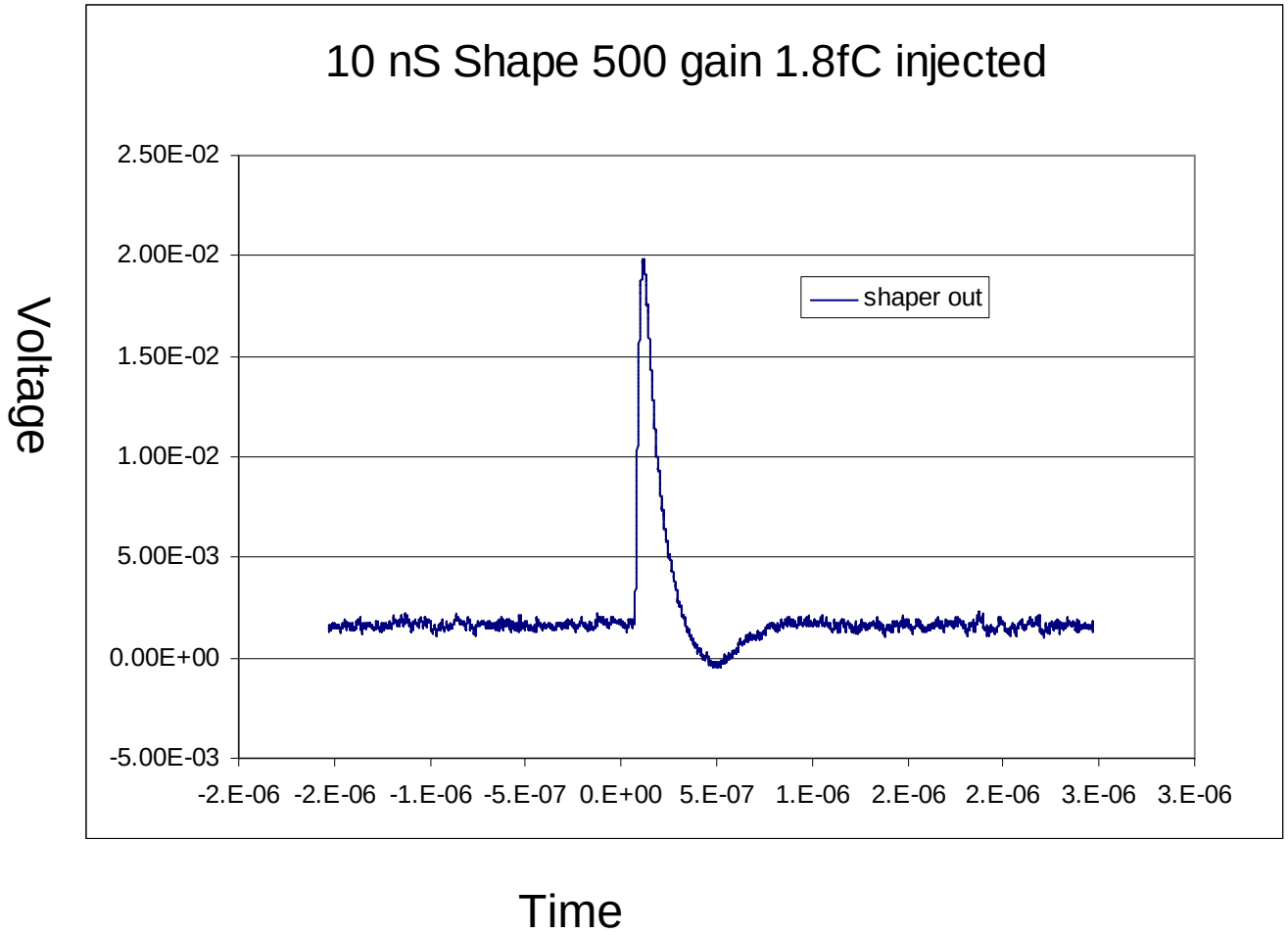
Current Preamp



Current Preamp

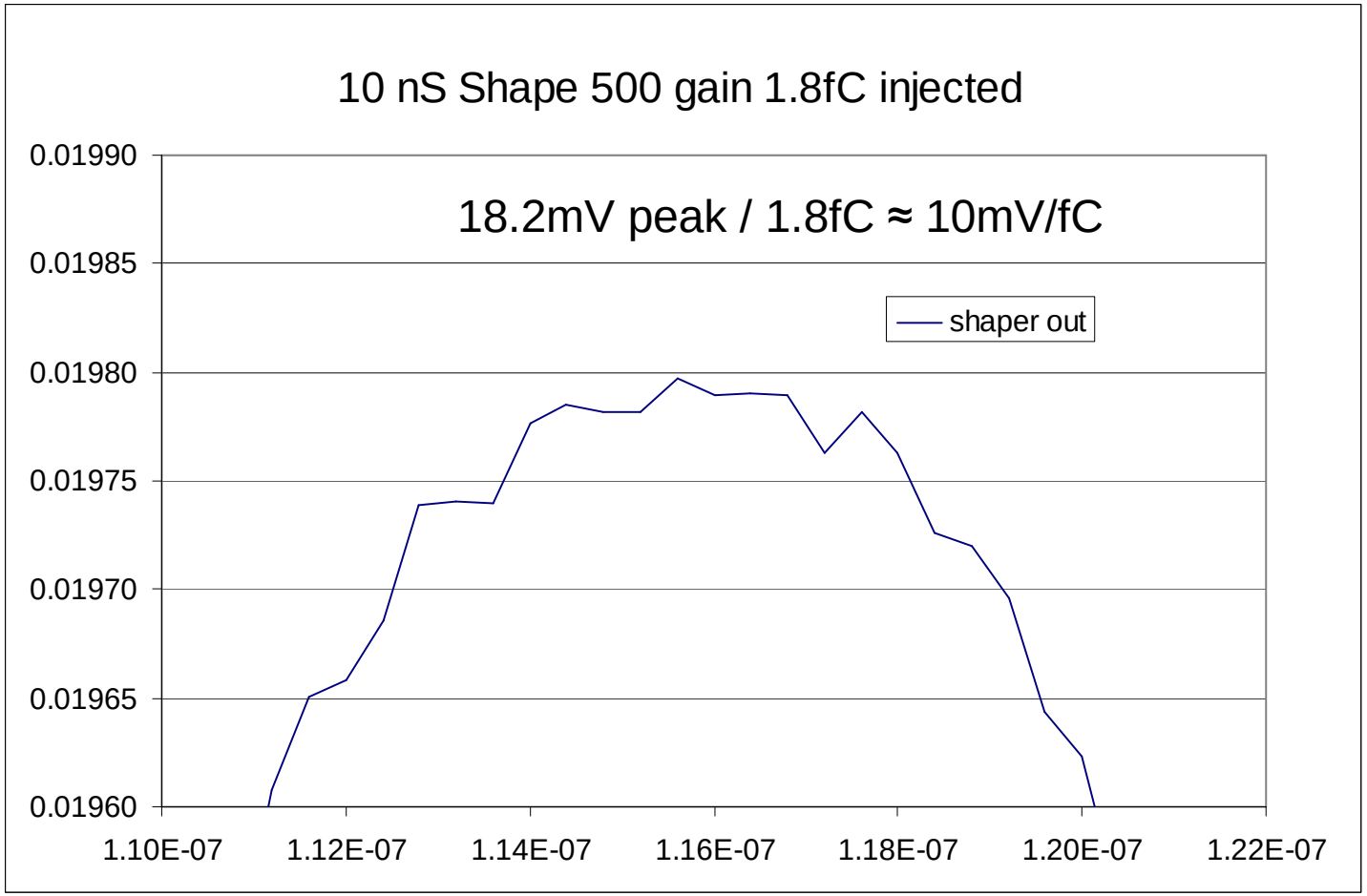


CSV file

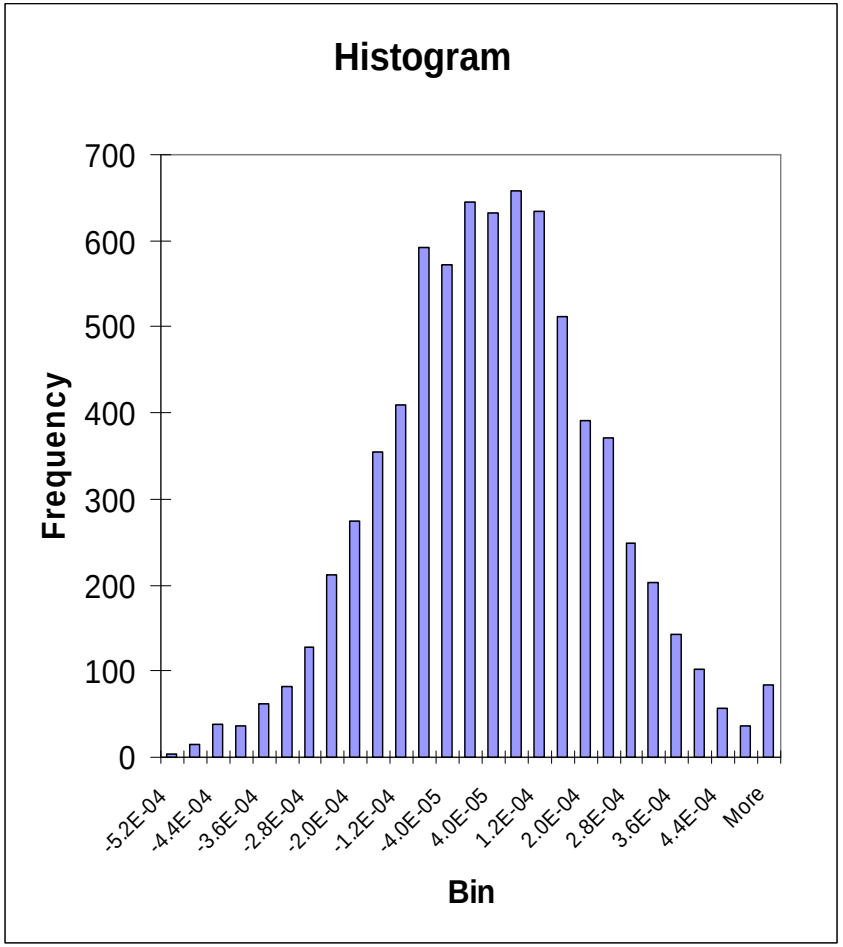

10 nS Shape 500 gain 1.8fC injected
2.50E-02
2.00E-02
1.50E-02
1.00E-02
5.00E-03
0.00E+00
-5.00E-03
shaper out
-2.E-06
-2.E-06
-1.E-06
-5.E-07
0.E+00
5.E-07
1.E-06
2.E-06
2.E-06
3.E-06
3.E-06
Voltage
Time

Peak

1.9172E-04V RMS → 0.002fC → 12e$^{+/-}$



Histogram



FWHM = 0.44mV
0.044fC = 265 $e^{+/-}$
with Signal Averaging
512 samples

Bin	*Frequency*
-5.2E-04	4
-4.8E-04	15
-4.4E-04	39
-4.0E-04	37
-3.6E-04	62
-3.2E-04	83
-2.8E-04	128
-2.4E-04	212
-2.0E-04	275
-1.6E-04	354
-1.2E-04	409
-8.0E-05	592
-4.0E-05	572
-9.8E-19	645
4.0E-05	632
8.0E-05	658
1.2E-04	634
1.6E-04	512
2.0E-04	392
2.4E-04	371
2.8E-04	249
3.2E-04	203
3.6E-04	142
4.0E-04	102
4.4E-04	57
4.8E-04	37
More	84

Overshoot of Preamp

TTD

- Go after ground loops
- Preamp pulsing
  - reflection
  - pulse shape
- Improve Noise Analysis
  - Get an ADC
  - Use Mathematica
  - Oscilloscope RMS
- Need PCB layout software, sharing PADS license NOT working