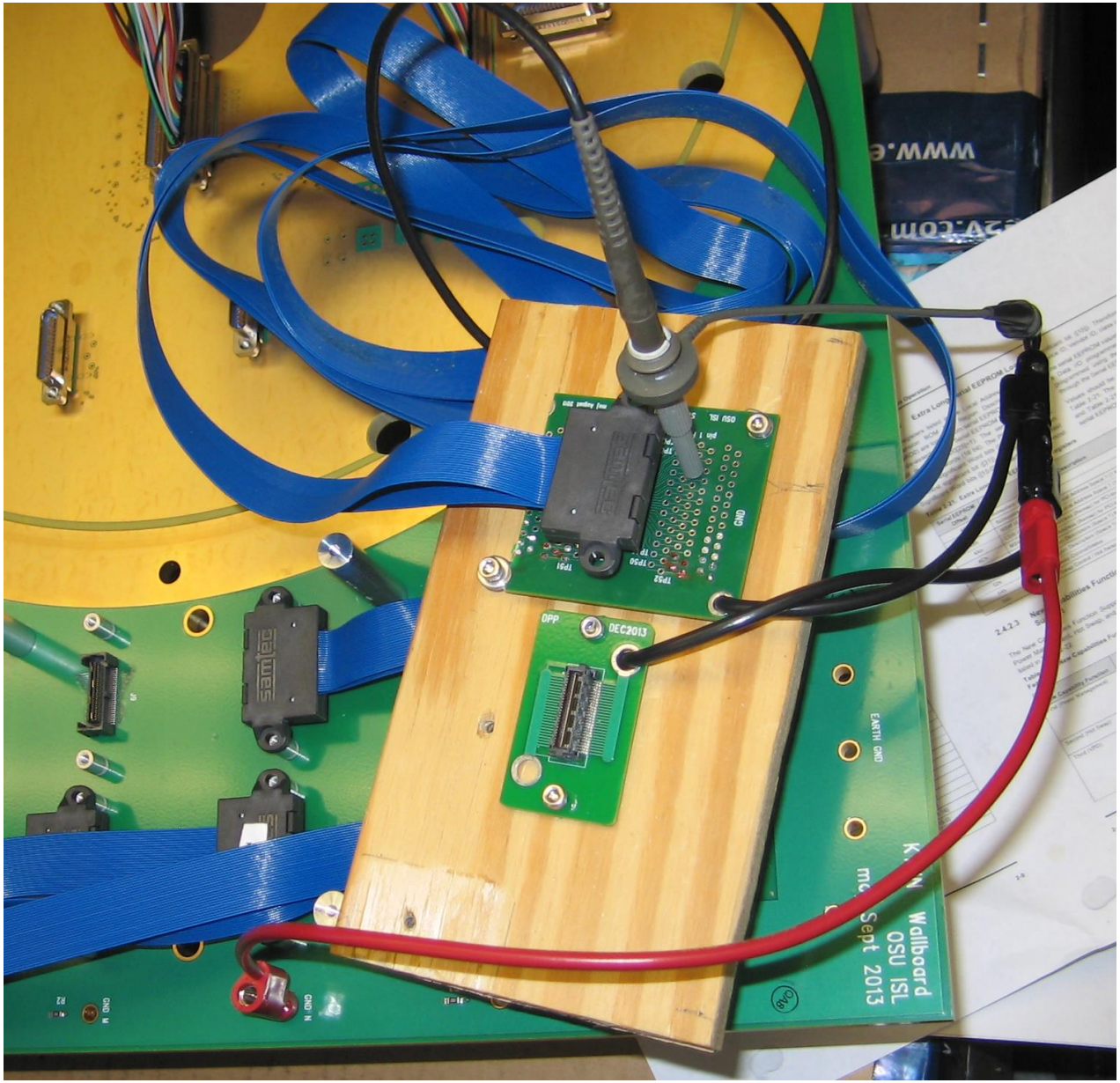
KMTN 9K Waveforms

2015-02-06

Setup, Blue cable between J78 and male breakout board, probe in pin 14 (should have tape on 8 OS pins!)
Note ‘scope probe ground connected to banana plugs


DPP
DEC2013
EARTH GND
Wallboard
OSU ISL
Sept 2013

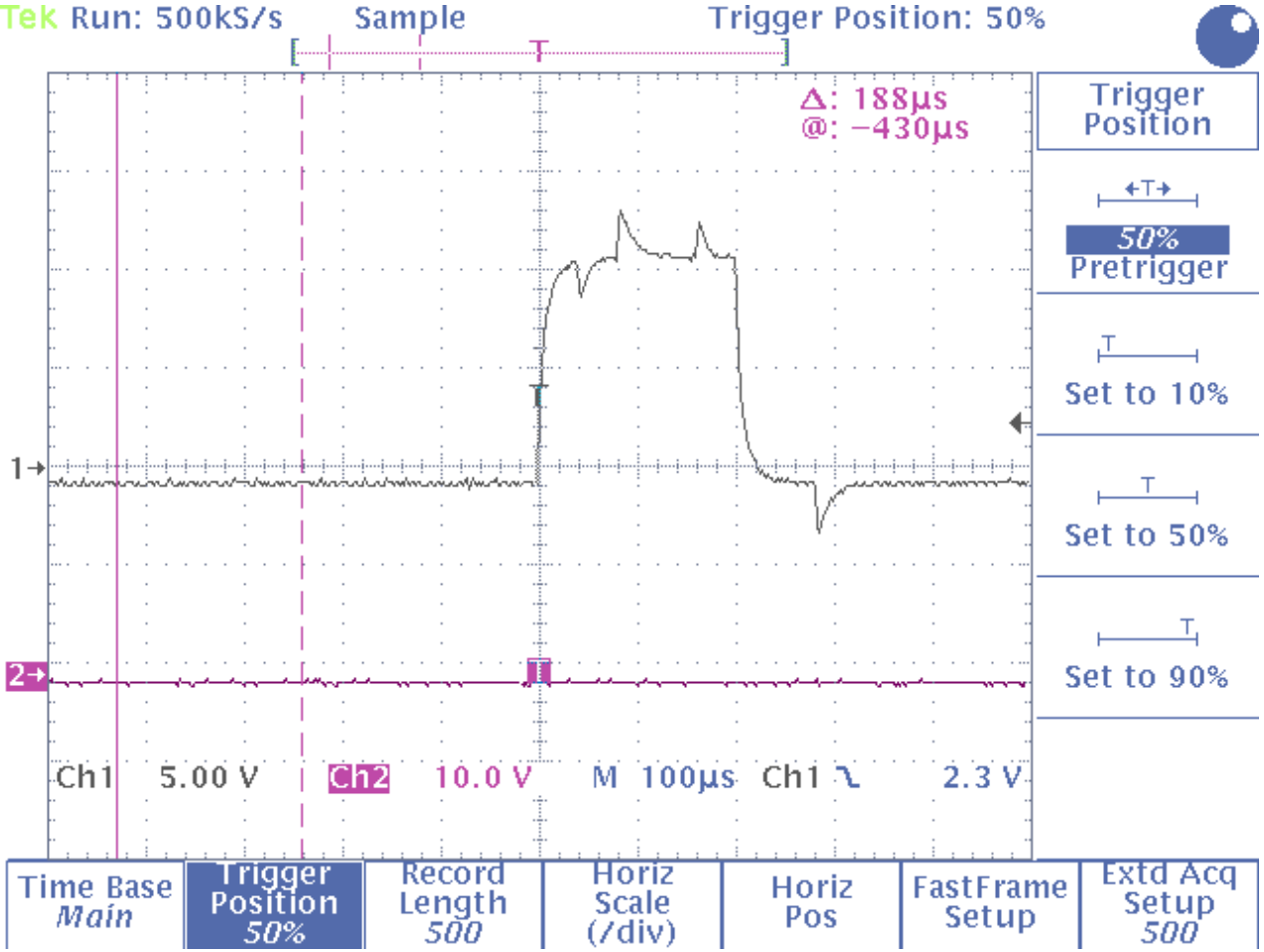
Waveform Notes 1

- All taken with a dummy load, details will be somewhat different when connected to a CCD
- All waveforms triggered on negative edge and therefore the time relationship between phases is not shown.
- Note that vertical waveforms (A, D and TG) have a time base of 100 microseconds/division while serial waveforms (E, RG and SW) have a timebase of 200 nanoseconds/division.

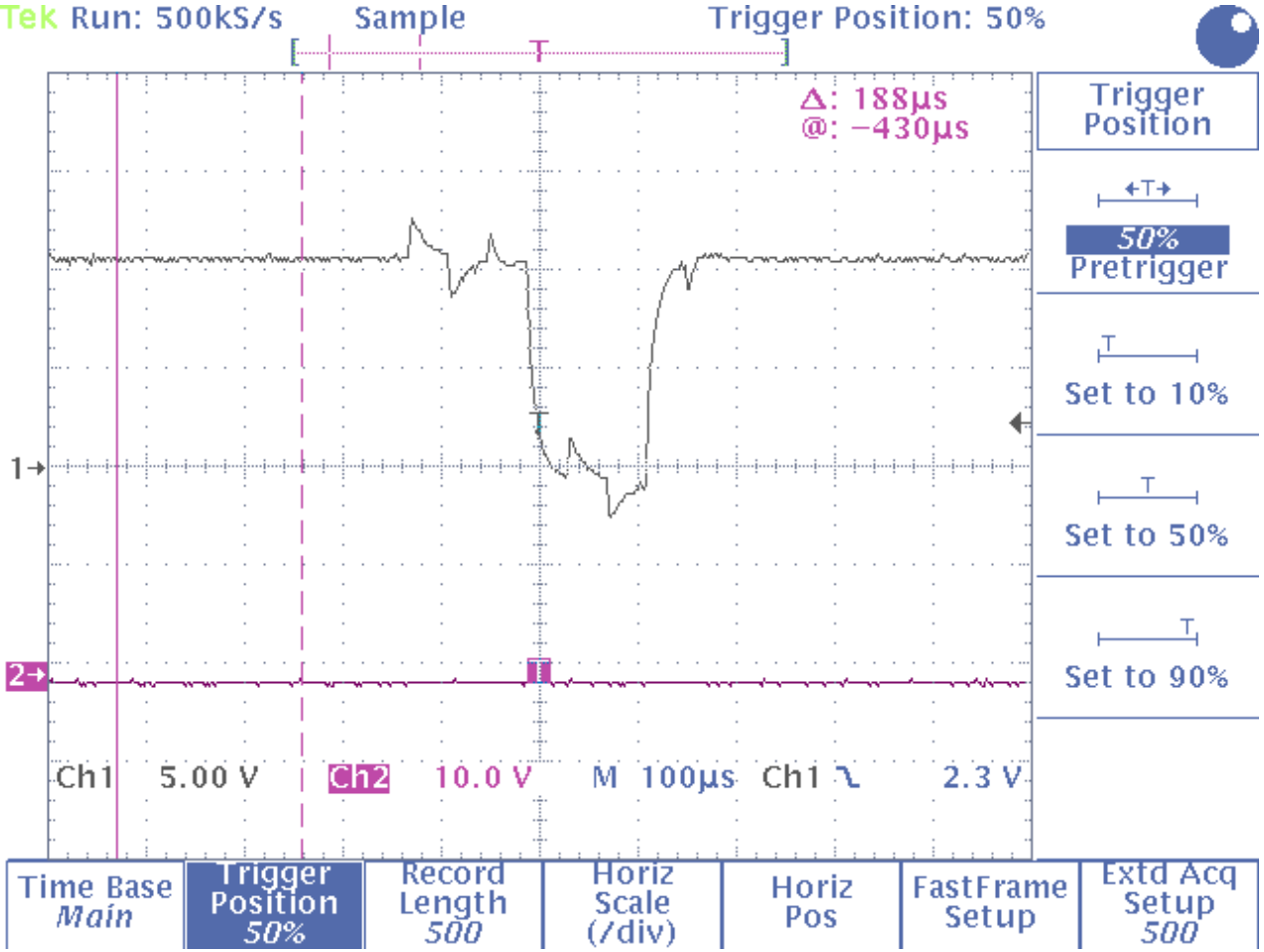
Waveform notes 2

- Note coupling between phases
- Note risetime is long for main clock phases (A, D, and E) and short for TG, SW and RG
- Note that each of the E phases is driven by 3 drivers on separate pins

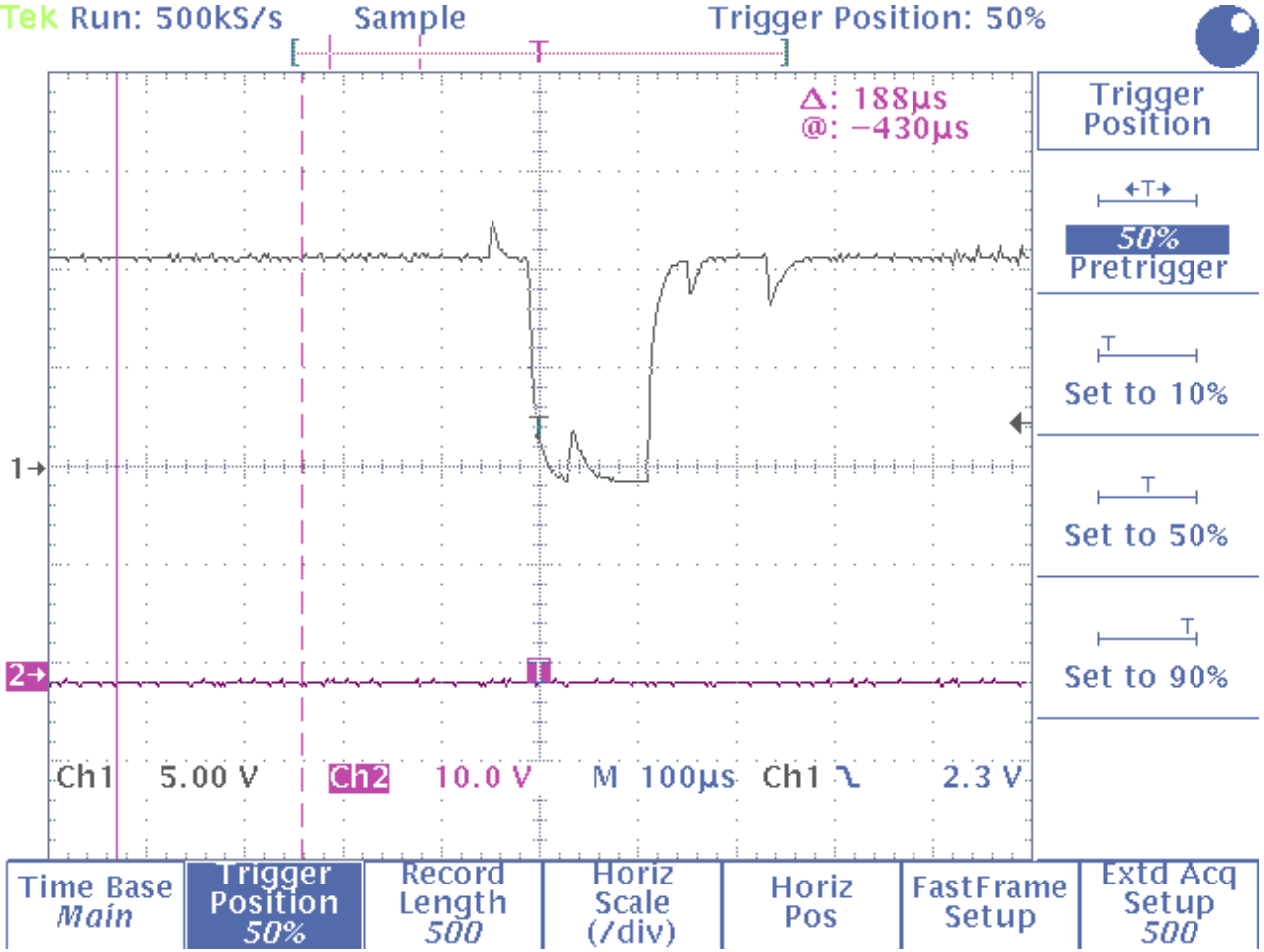
Pin 1 (A phase 1)



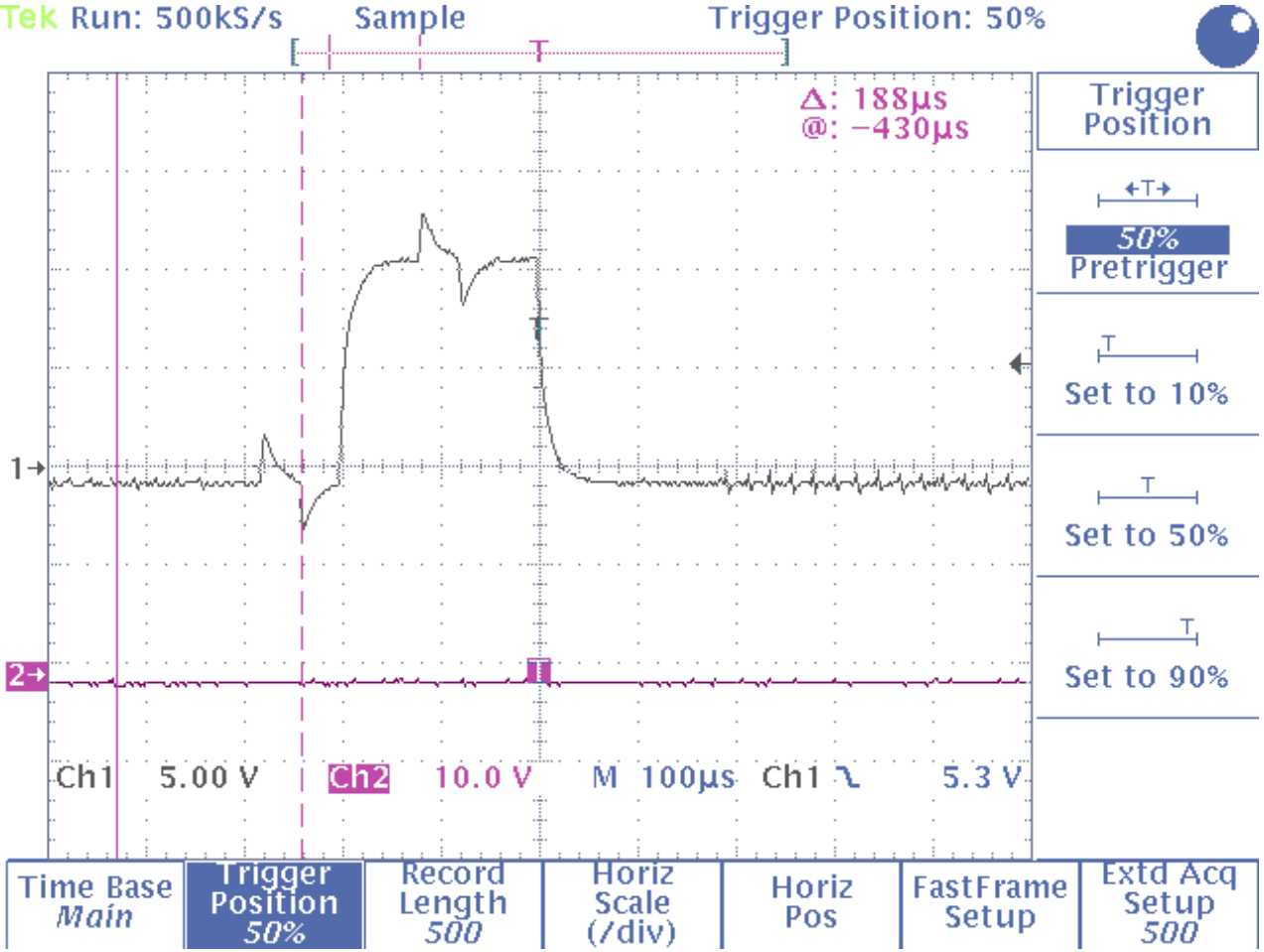
Pin2 (A phase 2)



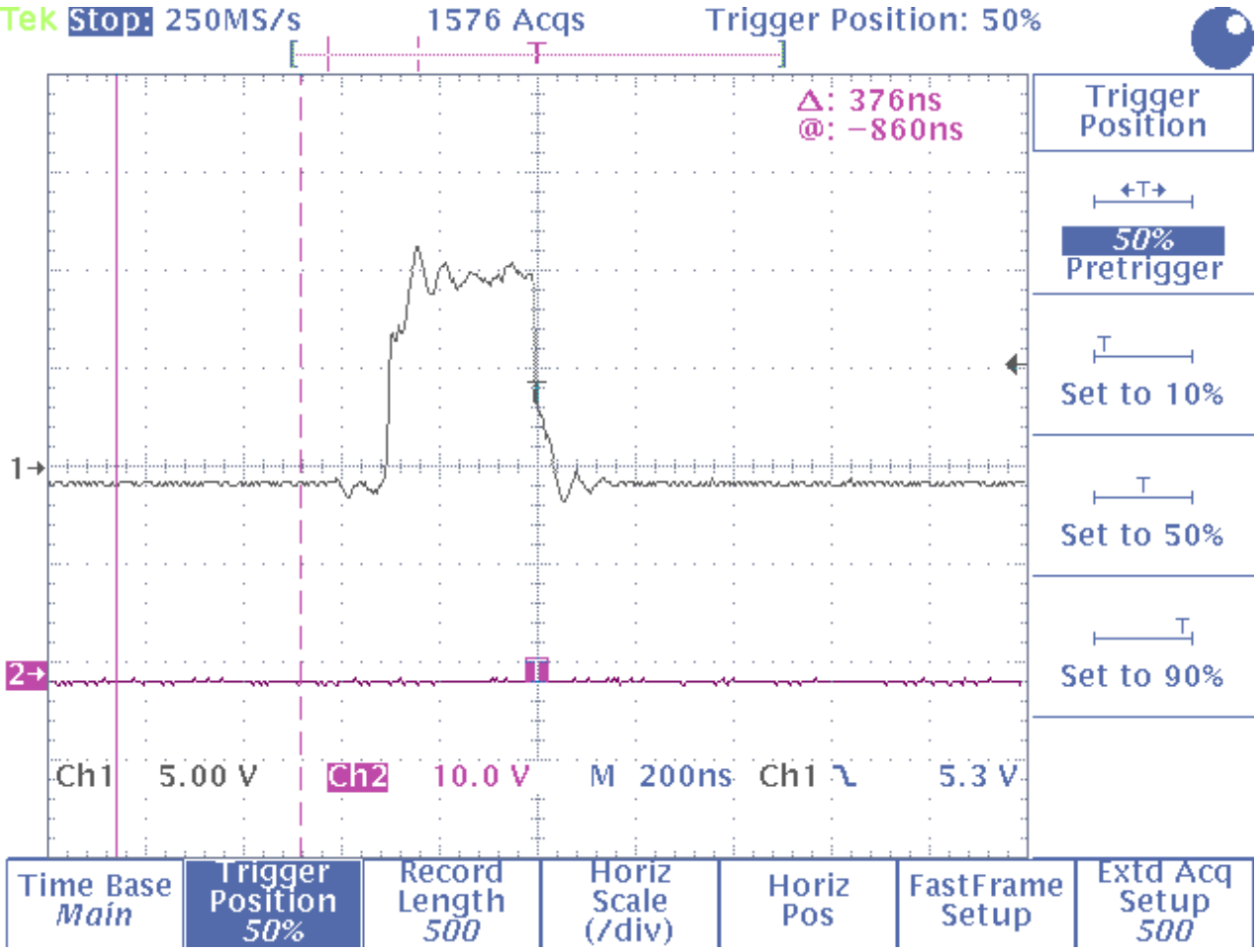
Pin3 (A phase 3)



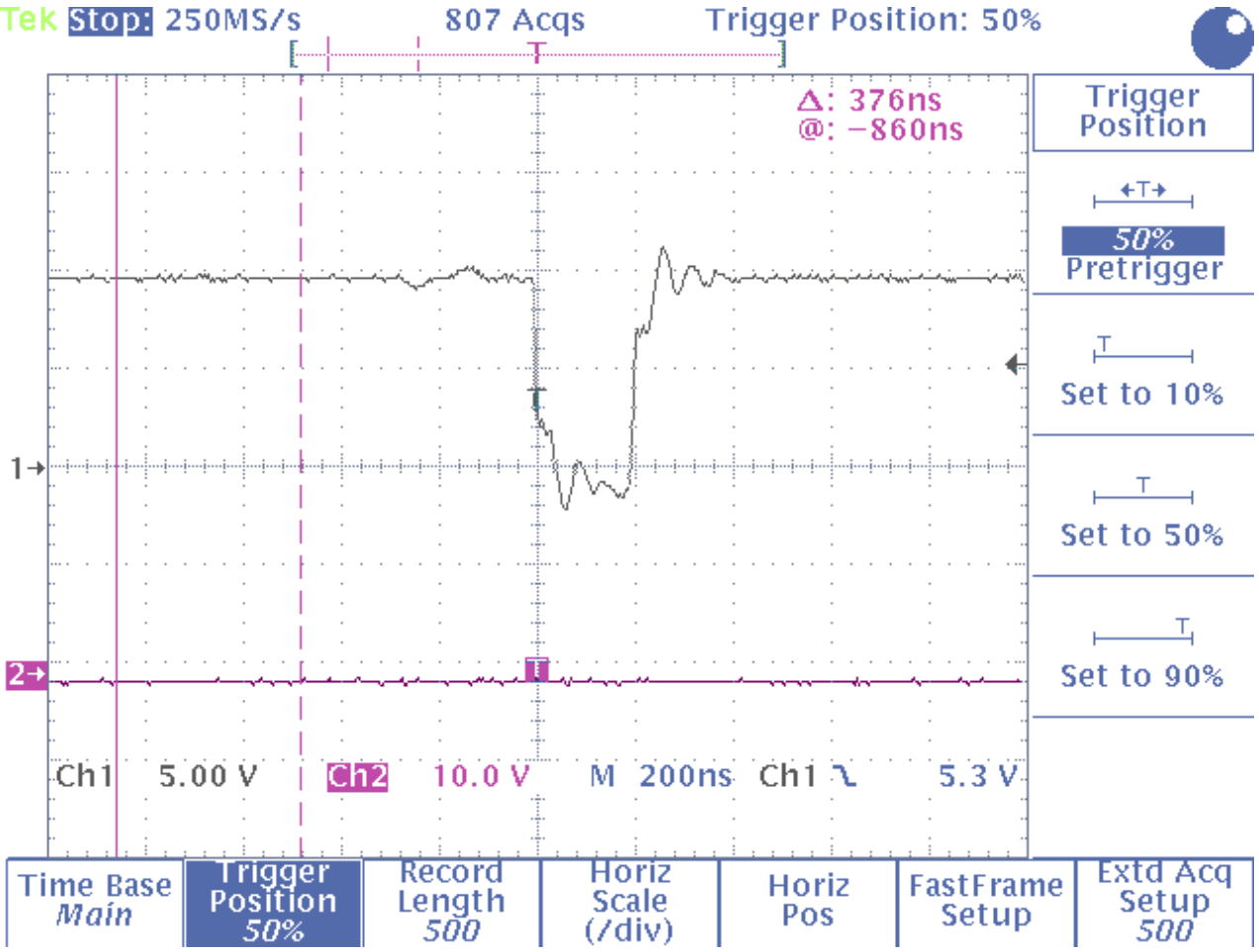
Pin 4 (A phase 4)



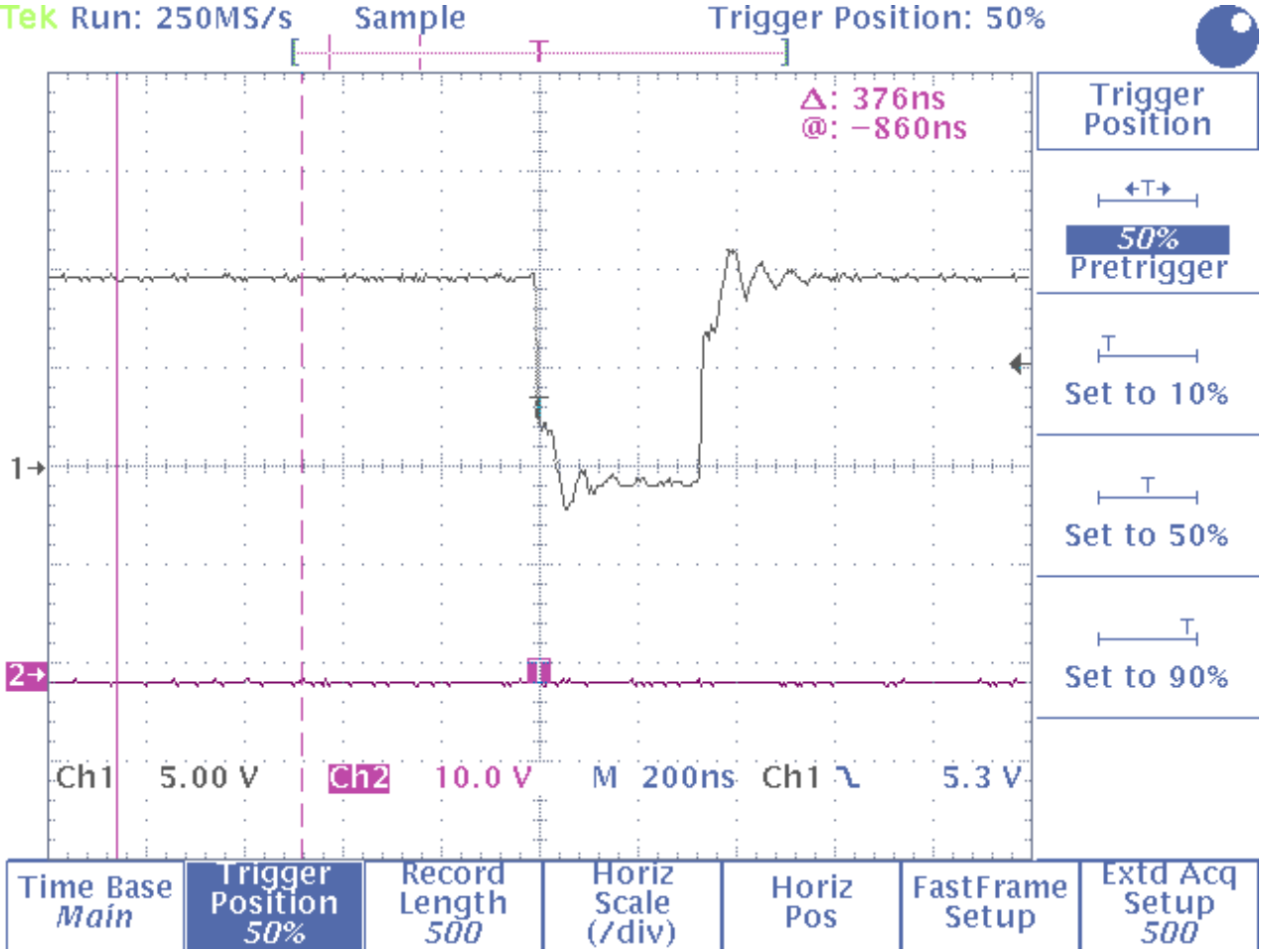
Pin 5 (+ 13 & 23) (E phase 1)



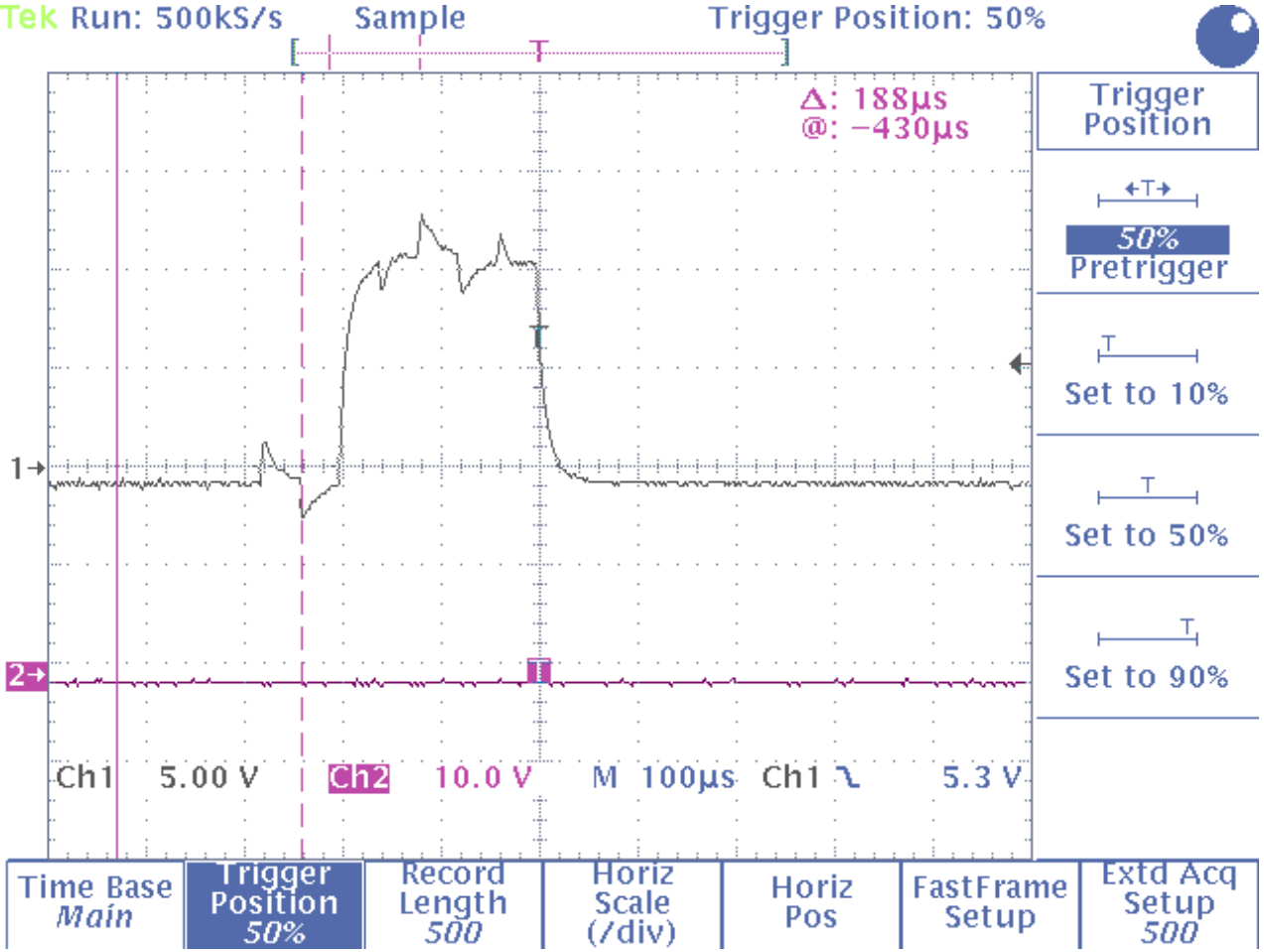
Pin 6 (+20 & 22)(E phase 3)



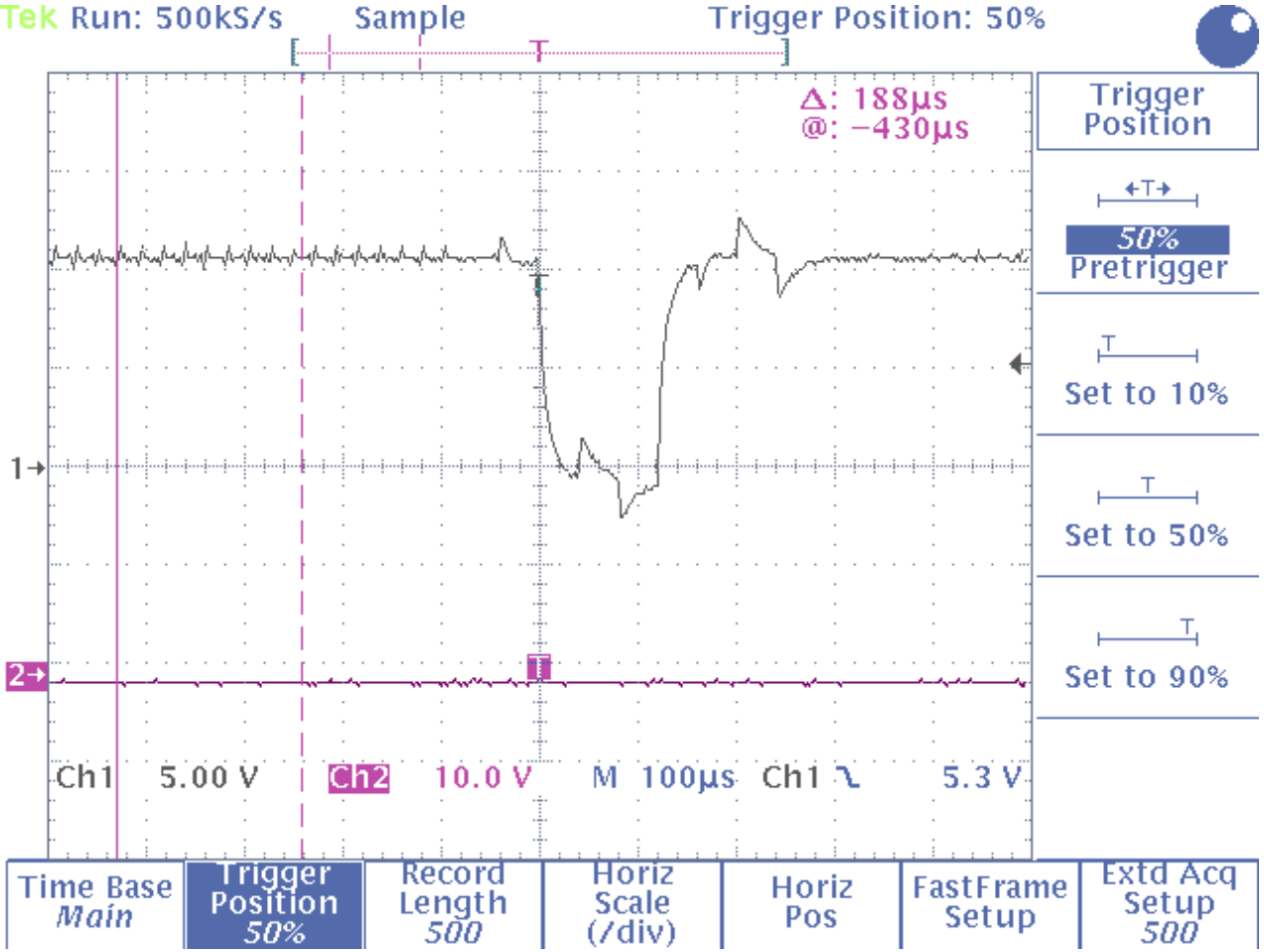
Pin 7 (+19 & 21)(E phase 2)



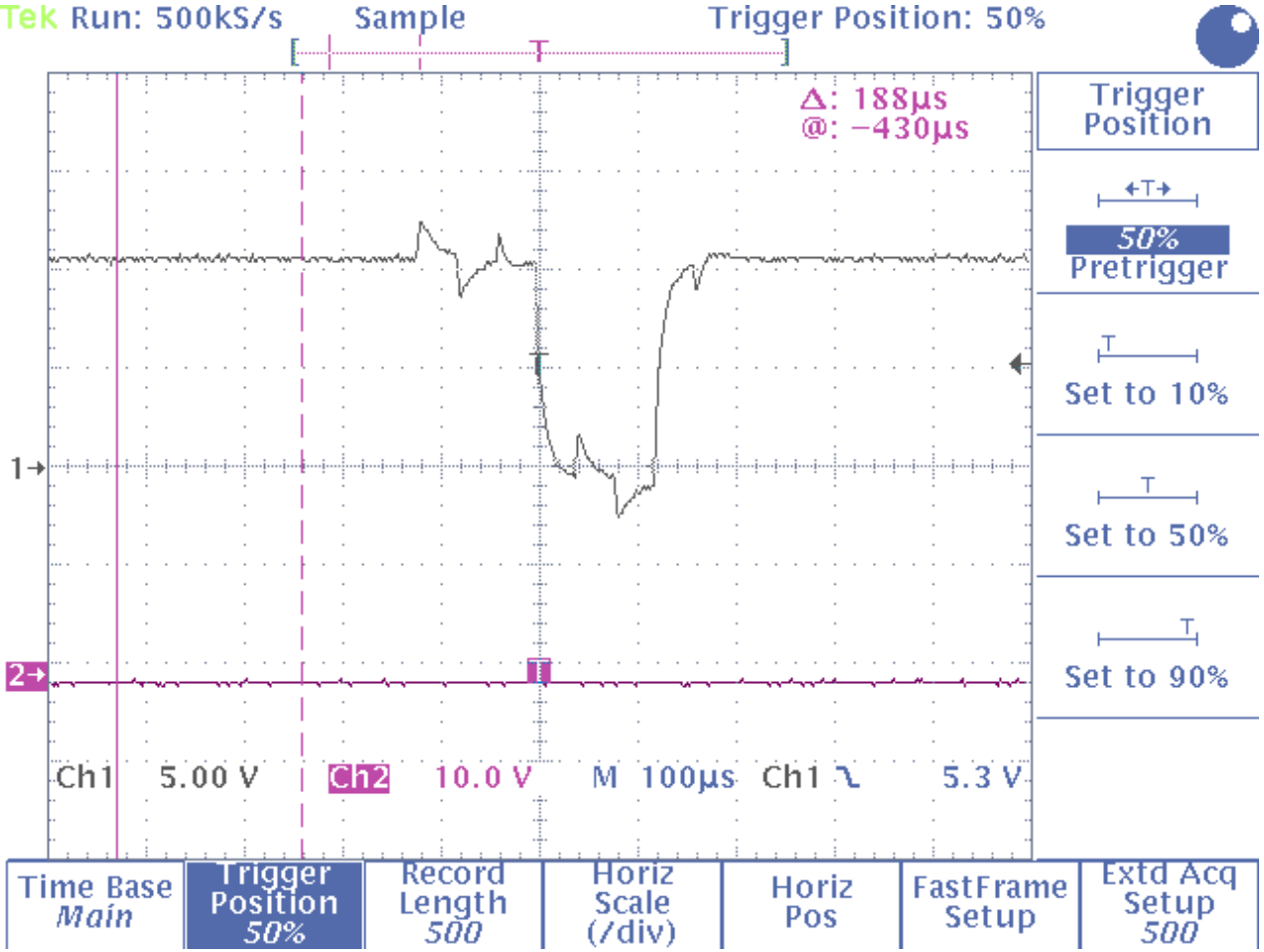
Pin 8 (D phase 1)



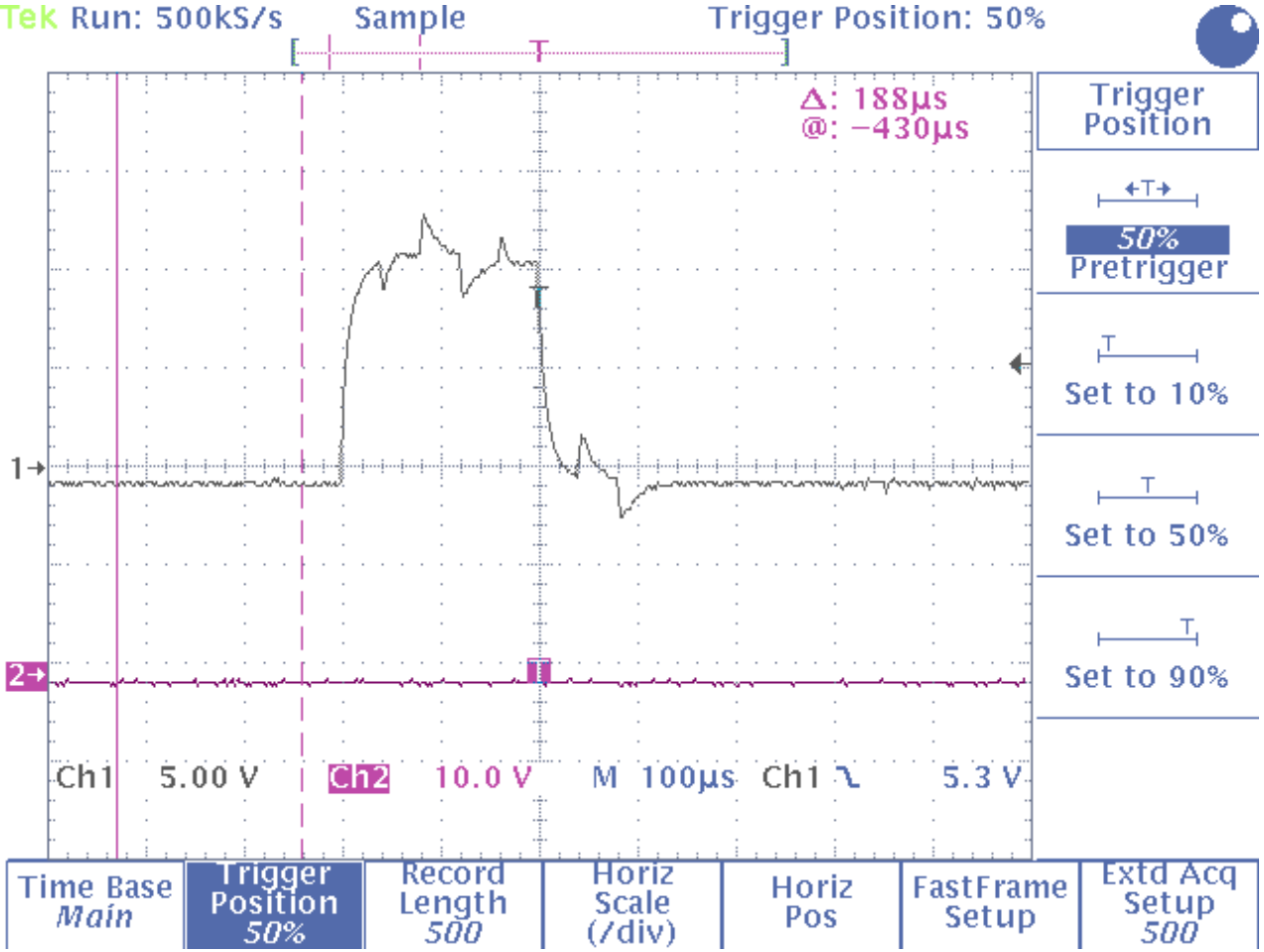
Pin 9 (D phase 2)



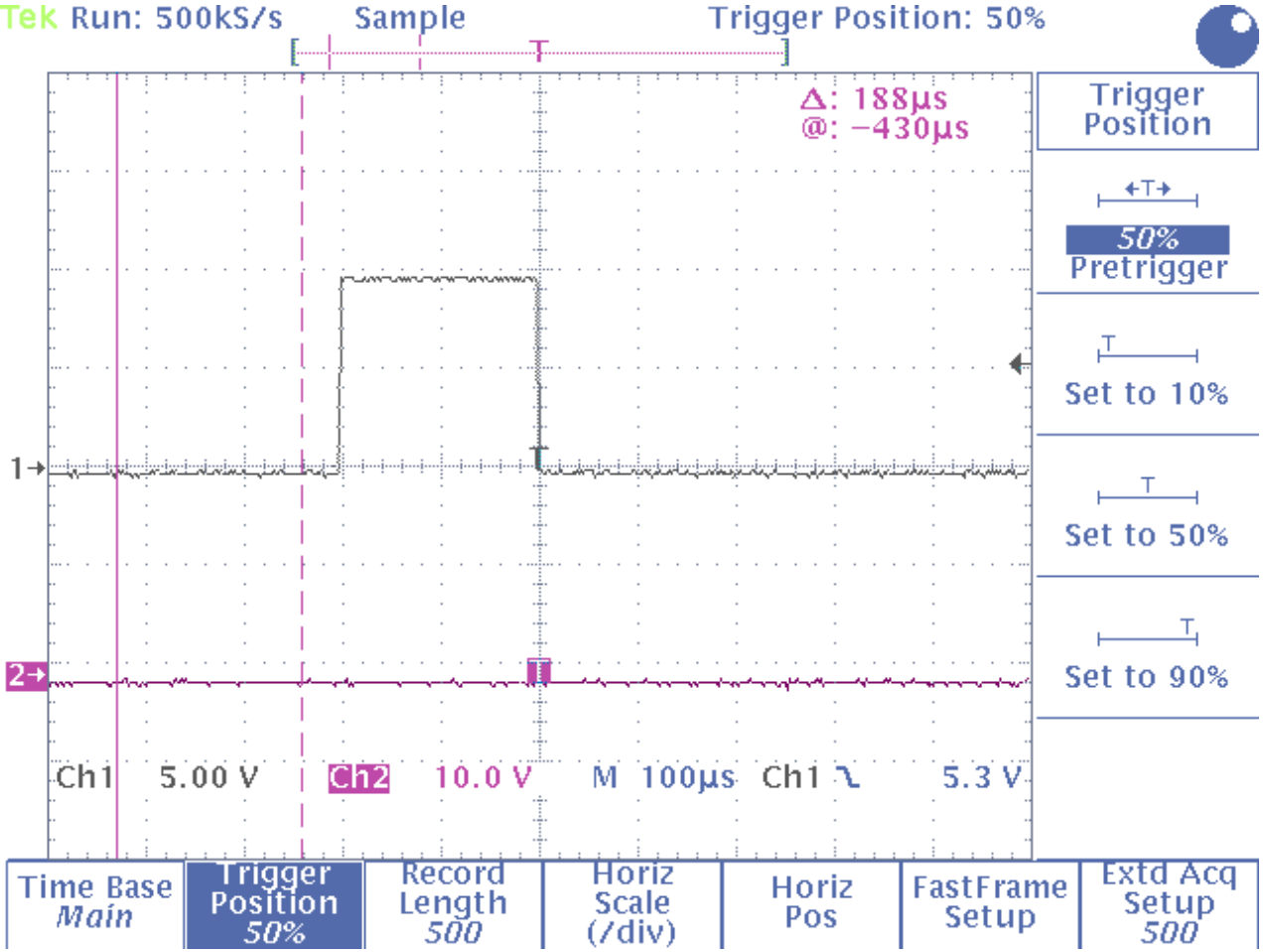
Pin 10 (D phase 3)



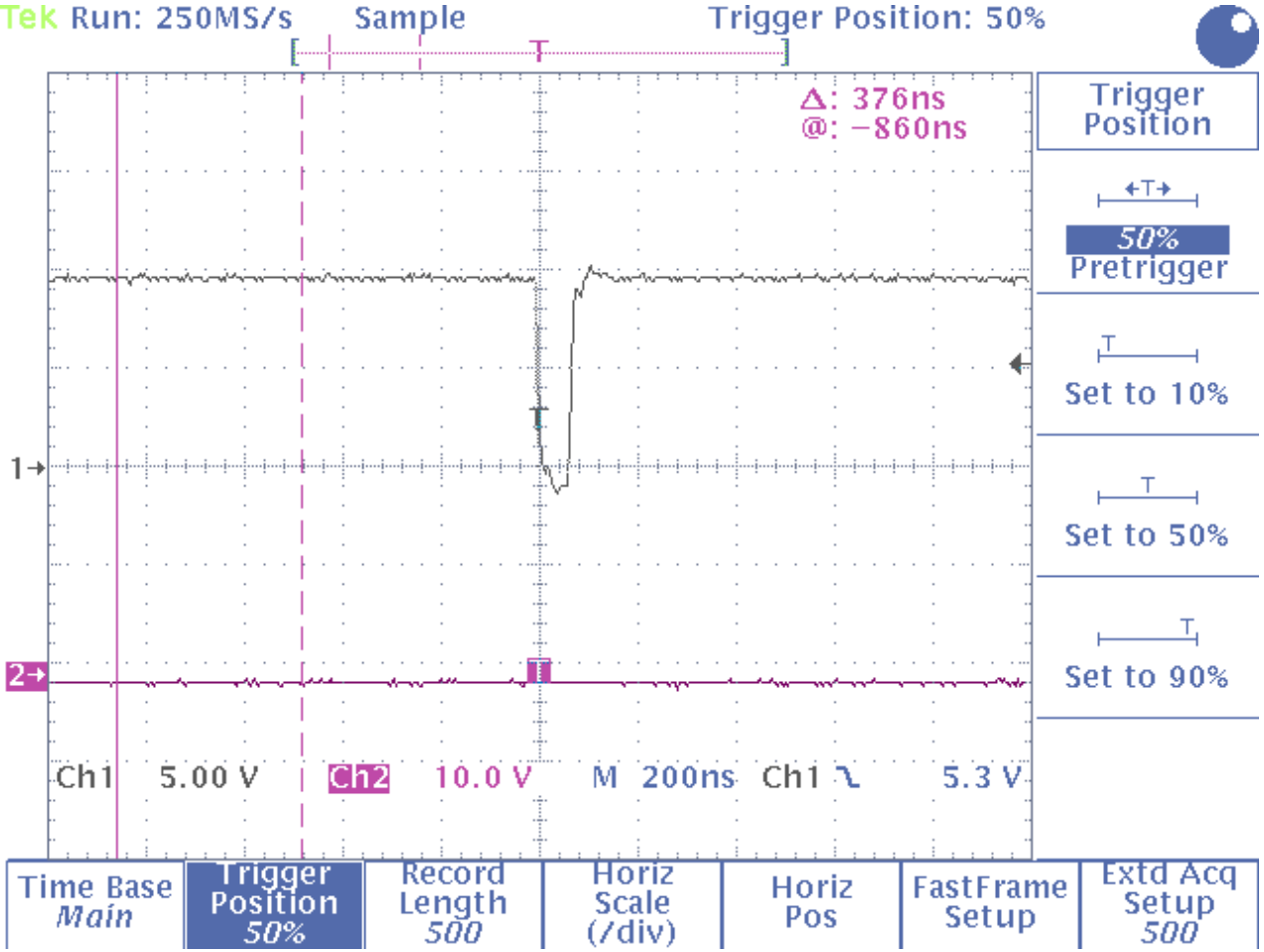
Pin 11 (D phase 4)



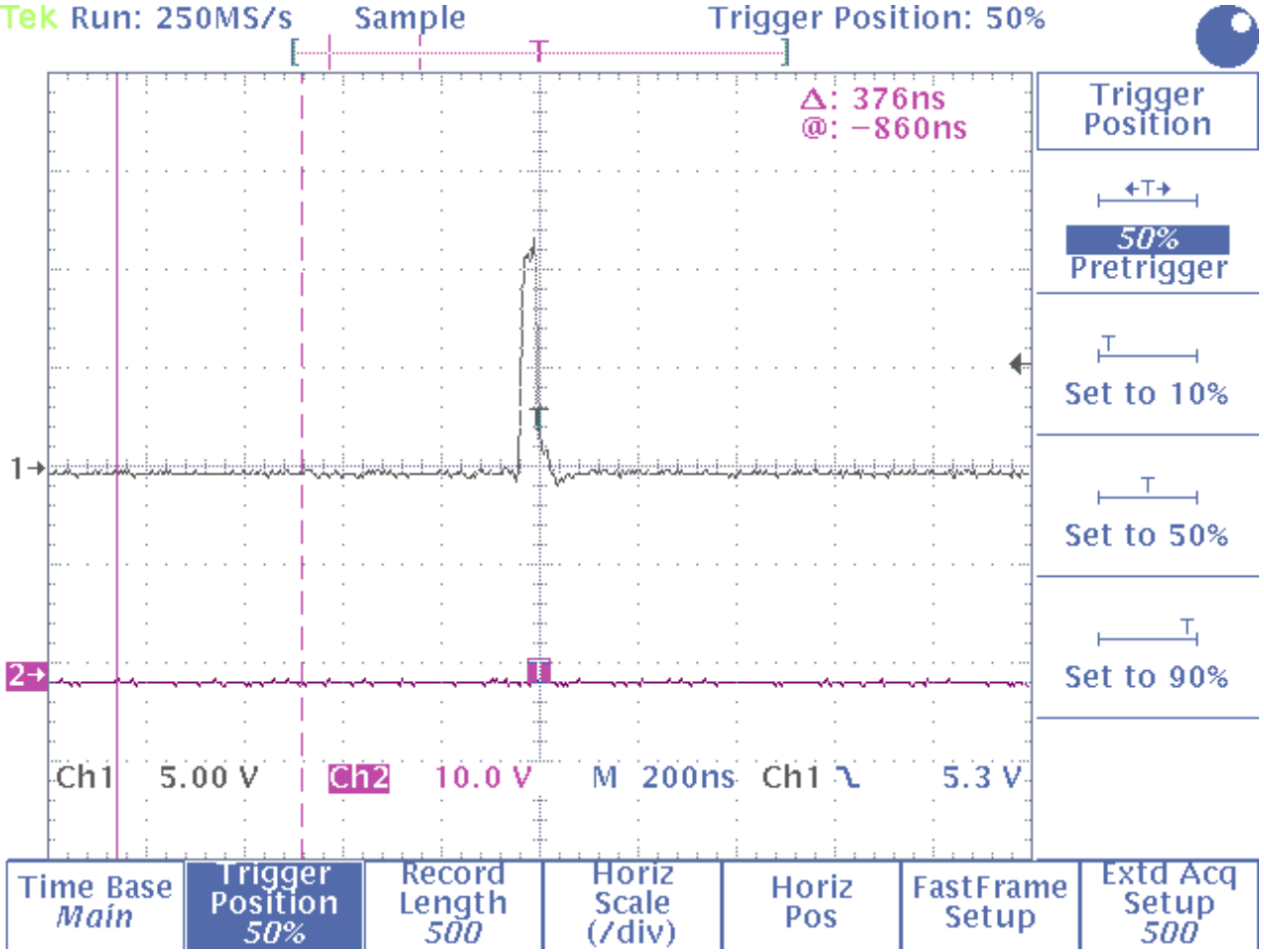
Pin 12 (Transfer Gate)



Pin 14 (Summing Well)



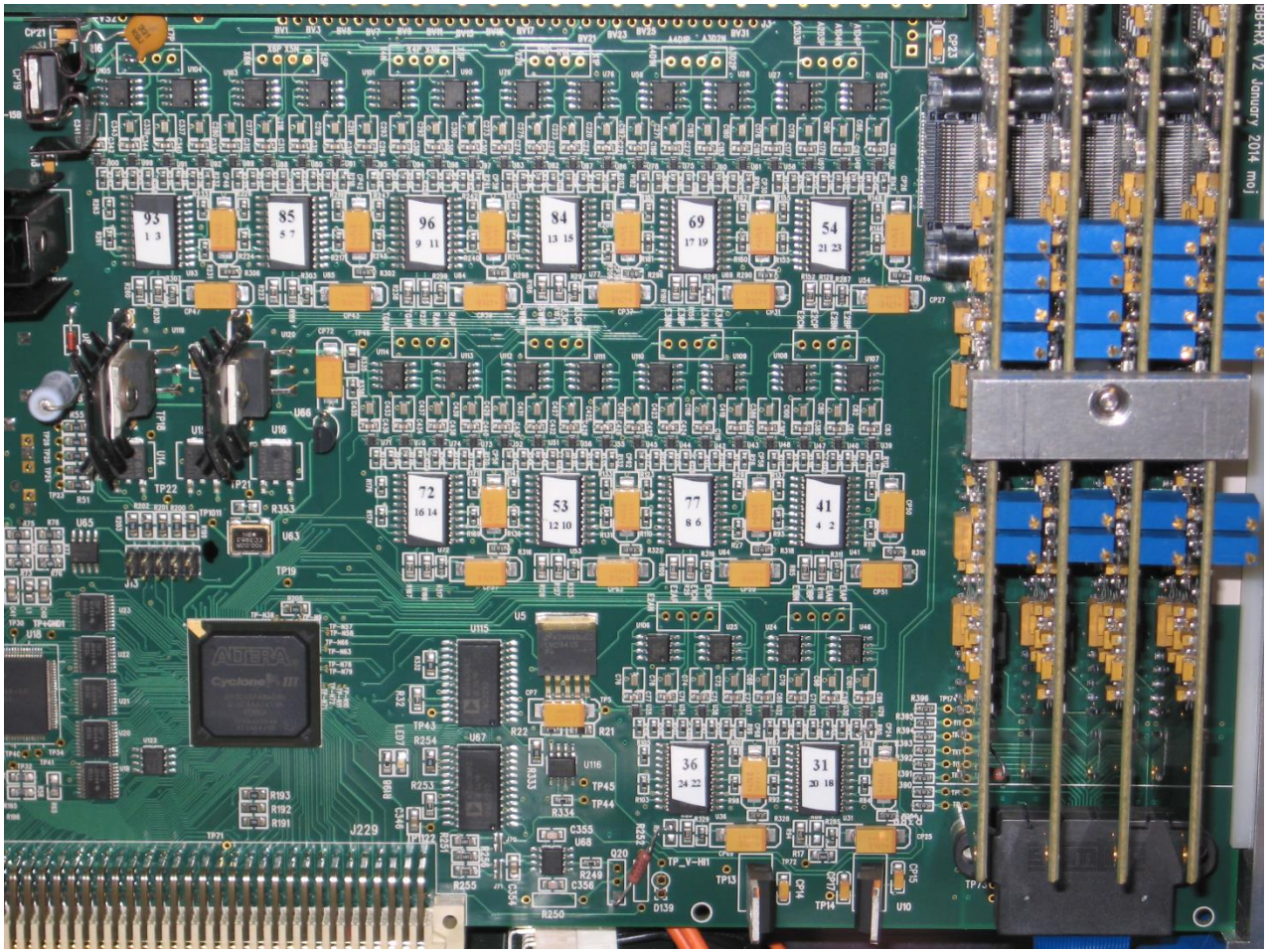
Pin 15 (Reset Gate)



Waveforms on the CBB

- The same waveforms can be observed on the Clock Bias Board
- Each of the Clock Driver Integrated Circuits (cdic) is has a white label
- The large number is the reference designator for that cdic
- The two small number correspond to the driver number (two for each integrated circuit) and are also the pin numbers in the blue cables

Clock Bias Board Clock Drivers



Clock Driver Circuits 1

- Below each cdic are two 43 Ohm resistors, one for each of the 24 clocks.
- The 43 Ohm resistors act as back terminators for the 50 Ohm cables to the CCD.
- The side of the resistor farther away from the cdic is connected to the CCD through the blue cables and the Wall Board

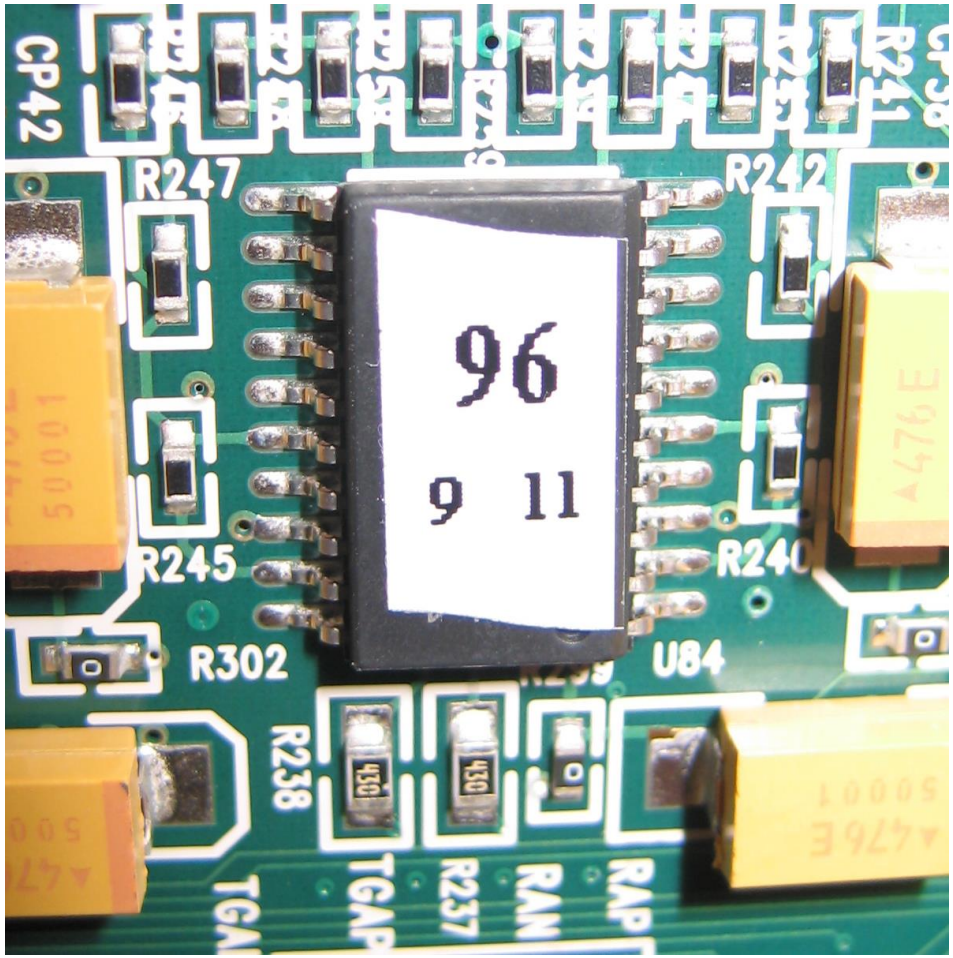
Clock Driver Circuits 2

- Probing the side of the resistor away from the cdic will give nearly the same waveform as shown above.
- Reflections from the CCD, which occur about 40 nsec after the drive signal, will be seen.
- The other side of the resistor is on the output of the cdic and will have clean square edges

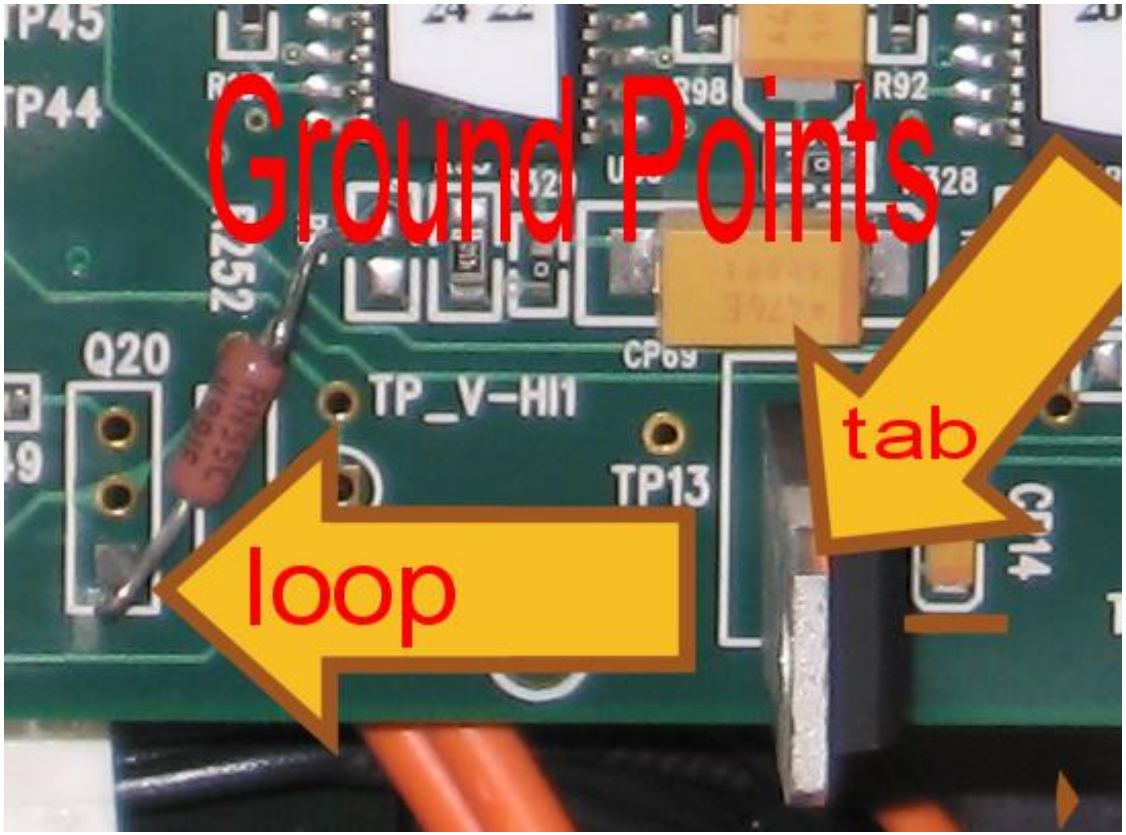
Detail of CDIC U96, clocks 9 and 11

- The photo below is a close-up of cdic U96
- The 43 Ohm resistors, R238 and R237 can be seen
- R238 corresponds to the pin 9 clock signal as indicated by the small number, bottom left, on the cdic label
- R237 corresponds to the pin 11 clock signal, as indicated by the small number, bottom right, on the cdic label

U96 detail


CP42
R247
R242
R241
96
9 11
R245
R240
R302
U84
R238
TGAP
R237
RAM
RAP

Possible ‘scope probe ground points for CBB



Caution

- Do not attempt to probe other parts of the CBB, especially the very dense area directly above each cdic.