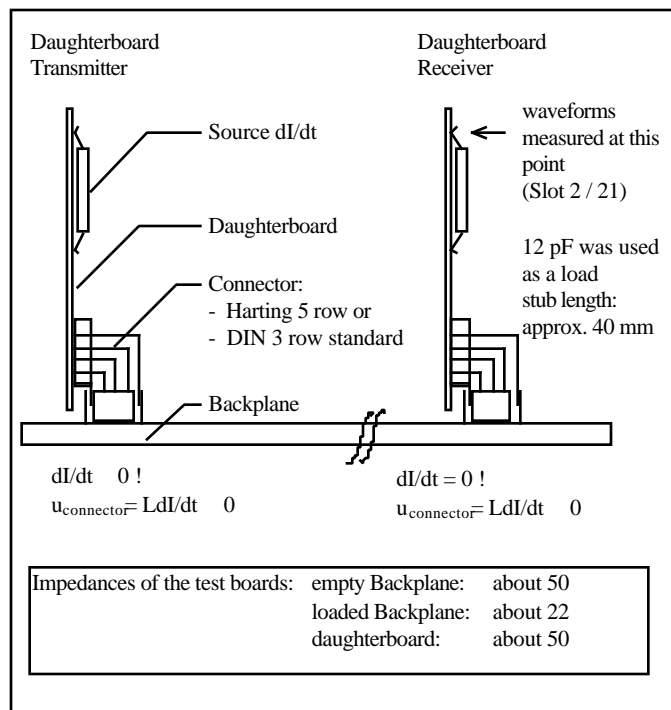


Trenew Electronic GmbH	VME64x	
Andreas Lenkisch, R&D	Test Results	

## Results of first measurements on a VME64x to confirm the simulations

A test setup as follows was used:

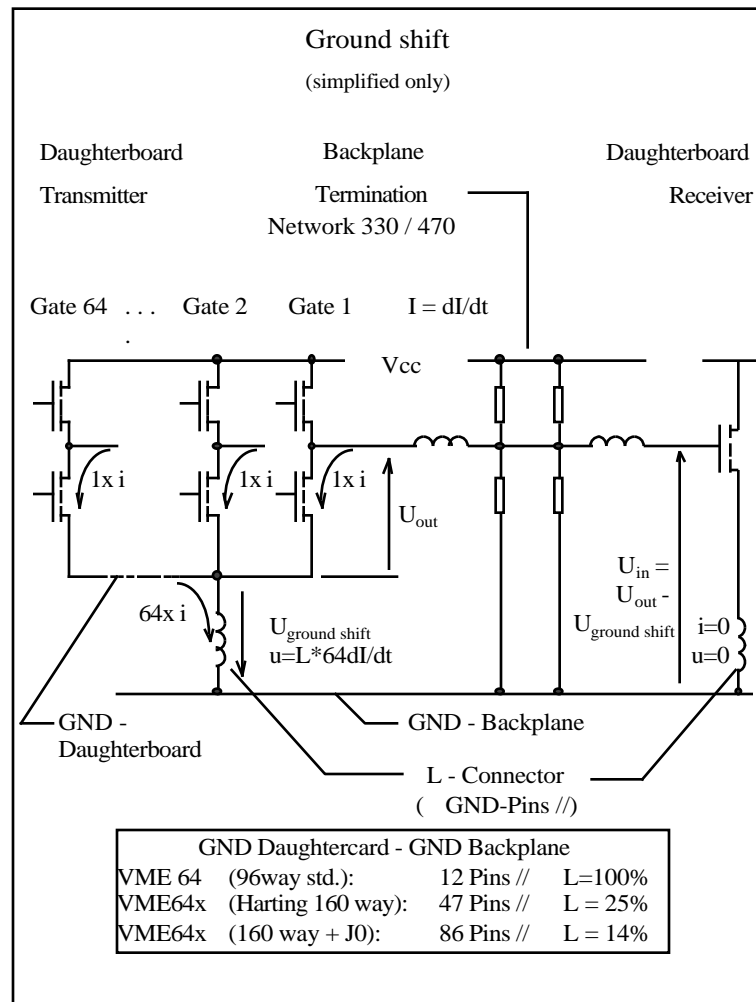
- 21 Slot VME64x backplane, line impedance about 50
- transmitter with ABTE devices on Slot 1
  - about 40 mm stub length
  - about 60 impedance
- passive loadboards on all the remaining 20 slots:
  - 12 pF load capacitance
  - approx. 40mm stub length
  - approx. 50 impedance
- waveforms were measured on Slot 2 or 21 at the end of the stub, without the load capacitor, only the capacitance of the probe of 8 pF was added



## Results and Conclusions

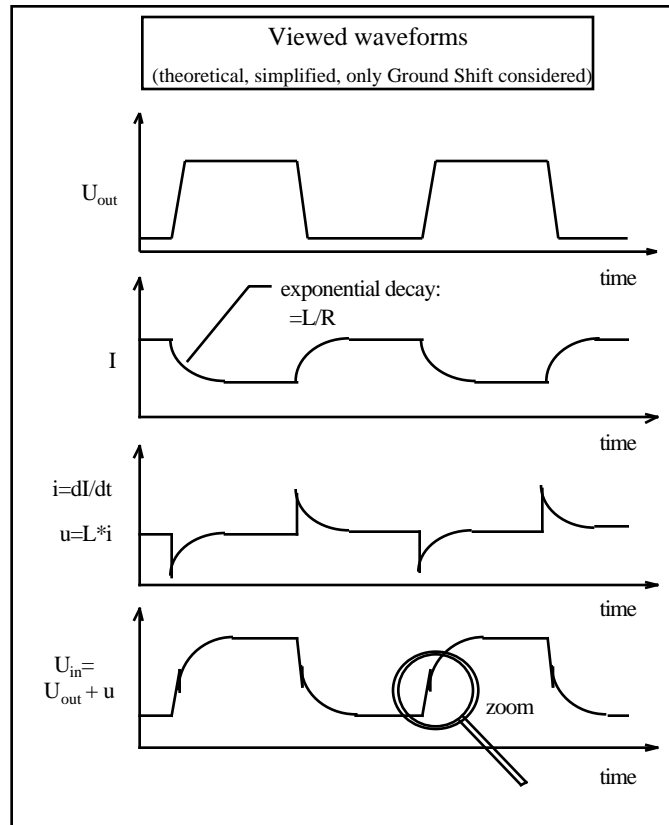
- cross talk was lower than expected, the measured level are acceptable
- the shelf on the edges, due to reflection from the end of the Backplane does not play a significant role, they are not in the threshold region
- shelves or negative going curves on the rising edge also added by Ground Shift (v.v. on falling edges)
- rise and fall times of the ABTE driver are faster than expected, values of less than 1 ns are measured
- waveforms (signal and cross talk) influenced by many effects
- undershoot is more than expected
- for high speed digital transmission Ground Shift can't be neglected  
it must be reduced by a low inductive GND return path (sufficient GND-pins in the connector)
- further investigations are needed (this report gives only a first impression)

### Some considerations of the source of Ground Shift and it's effect's

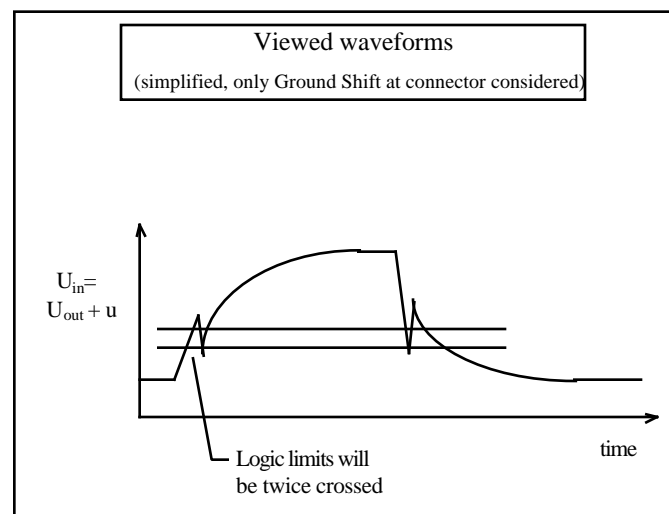


Ground Shift is a positive or negative voltage due to current transients on inductive parts of a current path, e.g. the connector pins.

The GND-pins of the connector collect the single currents of each individual signal line. If there are not sufficient parallel wired, Ground Shift will becoming a growing significance. Also in faster systems, were  $dI/dt$  is bigger, the effects due to Ground Shift shall be not neglected, as measured here.

**Estimation of the viewed waveforms, very simplified consideration**

## Zoom of the last waveform of the upper figure



### Measurements on the VME64x system according to the o/m test setup

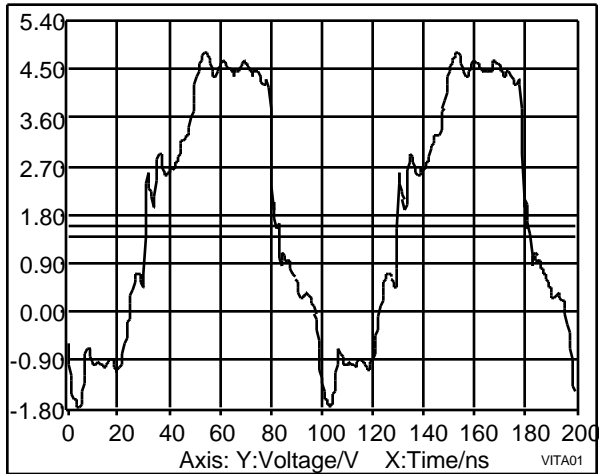


Fig. 1  
 waveform on slot 2, 5-row connector  
 20 passive load boards  
 the ETL threshold levels indicated

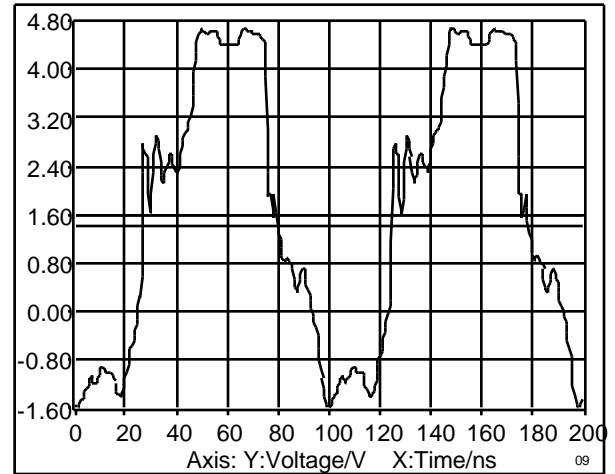


Fig. 2  
 waveform on slot 2, 3-row connector  
 20 passive load boards  
 the ETL threshold levels indicated

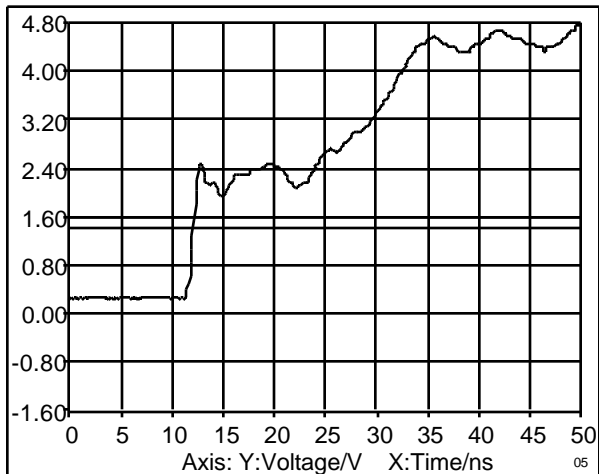


Fig. 3  
 waveform on slot 2, 5-row connector  
 20 passive load boards  
 exciting frequency 100 kHz only

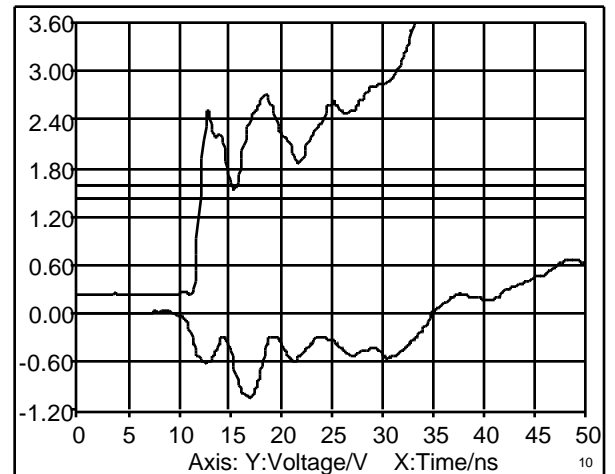


Fig. 4  
 waveform on slot 2, 3-row connector  
 20 passive load boards  
 with ground shift voltage

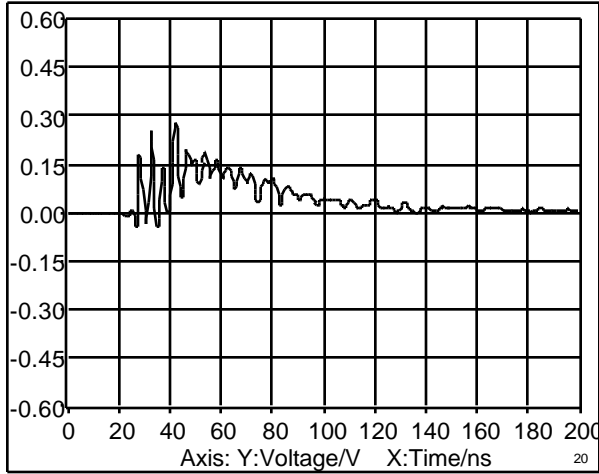


Fig. 5  
backward cross talk, pin C5 slot 2  
the same configuration as on fig. 3

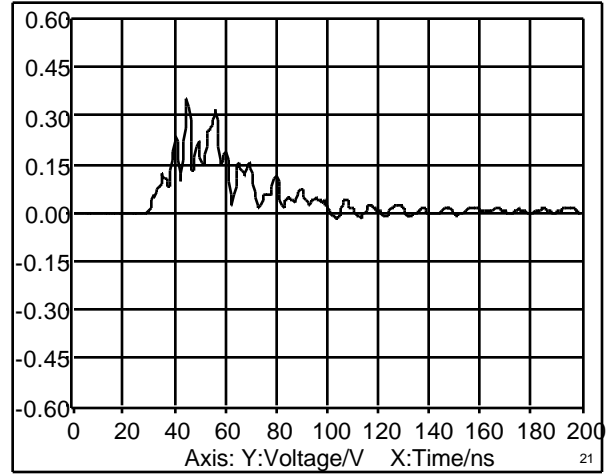


Fig. 6  
forward cross talk, pin C5 slot 21  
the same configuration as on fig. 3