PROPOSAL #1

SHORT DISTANCE DIFFERENTIAL SCSI TRANSCEIVER

ADVANTAGES:

o HIGHER DATA RATE - CAN CLOCK DATA SOONER THAN SINGLE-ENDED (SE).

o LESS SENSITIVE THAN SE TO CABLE AND TERM POWER PROBLEMS.

o FAST SCSI AT 6 METERS?

o SIMPLE, CHEAP AND EASY TO INTEGRATE. ADDS ONLY 11 PINS.

o BACKWARD COMPATIBLE WITH SE.

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X379.2/89-131

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SHORT DISTANCE DIFFERENTIAL SCSI TRANSCEIVER

DISADVANTAGES:

o LIMITED TO SHORT CABLES.

o WAVEFORMS "UGLY"

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SHORT DISTANCE DIFFERENTIAL SCSI TRANSCEIVER

TRANSCEIVER PARTITIONING AND CHARACTERISTICS

DATA AND PARITY LINES (9)

o COMPLIMENTRY OPEN COLLECTOR DRIVER.
o DIFFERENTIAL RECEIVER.

REQUEST AND ACKNOWLEDGE LINES (2)

o ACTIVE PULL-UP AND PULL-DOWN DIFF. DRIVER (RS-422 TYPE).
o DIFFERENTIAL RECEIVER.

CONTROL LINES (7)

o SINGLE-ENDED DRIVER AND RECEIVER
  (CURRENT SPECIFICATION).

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SINGLE-ENDED (SE) CABLE PIN ASSIGNMENTS ALLOW EXPANSION
TO DIFFERENTIAL AND BACKWARD COMPATABILITY.

o ODD LINES (EXCEPT #25) ARE GROUNDED ON SE CABLE.

o CONVERT ADJACENT GROUND LINE TO SECOND DIFFERENTIAL
   LINE FOR A DIFFERENTIAL SYSTEM.

o FOR BACKWARD COMPATABILITY, DESIGN DIFFERENTIAL RECEIVER
   HAVING TTL THRESHOLD WHEN INVERTING INPUT IS OPEN.
   (THRESHOLD COULD ADJUST FOR OPTIMUM SE NOISE MARGIN).

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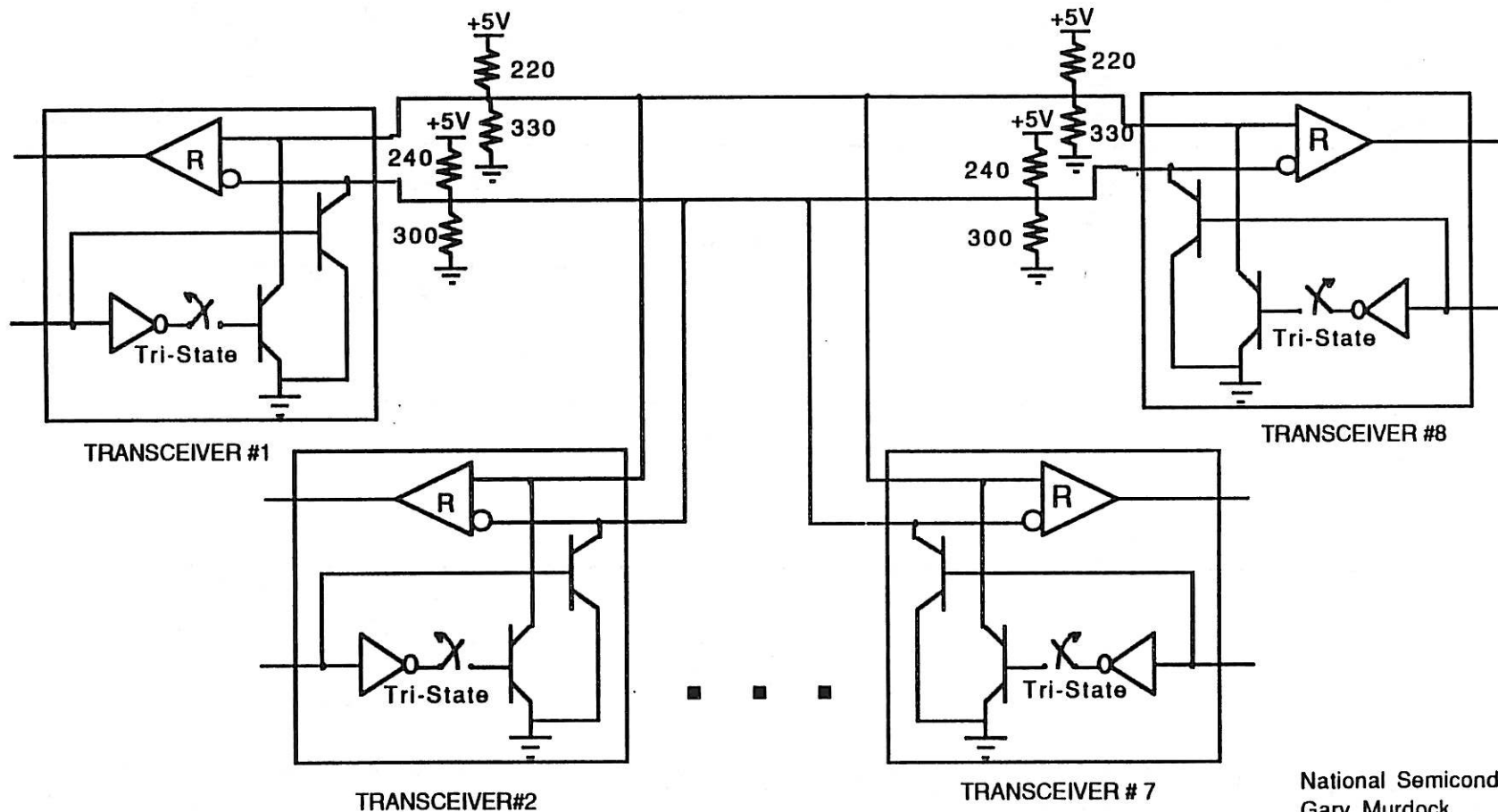
SHORT DISTANCE DIFFERENTIAL SCSI TRANSCEIVER

SINGLE-ENDED SCSI:

CABLE

OUT

+5V
220

SIGNAL (EVEN#)

+5V
220

OUT

330

330

IN

IN

GROUND (ODD#)

CONVERTED TO DIFFERENTIALSCSI:

CABLE

OUT

+5V
220

SIGNAL (+)

+5V
220

OUT

330

330

R

R

+5V
240

SIGNAL (-)

+5V
240

IN   Tri-State

300

300

Tri-State   IN

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SHORT DISTANCE DIFFERENTIAL SCSI TRANSCEIVER
CIRCUIT DIAGRAM: ONE CHANNEL, DATA AND PARITY LINE TYPE.

TRANSCEIVER #1

TRANSCEIVER#2

TRANSCEIVER #7

TRANSCEIVER #8

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SHORT DISTANCE DIFFERENTIAL SCSI TRANSCEIVER

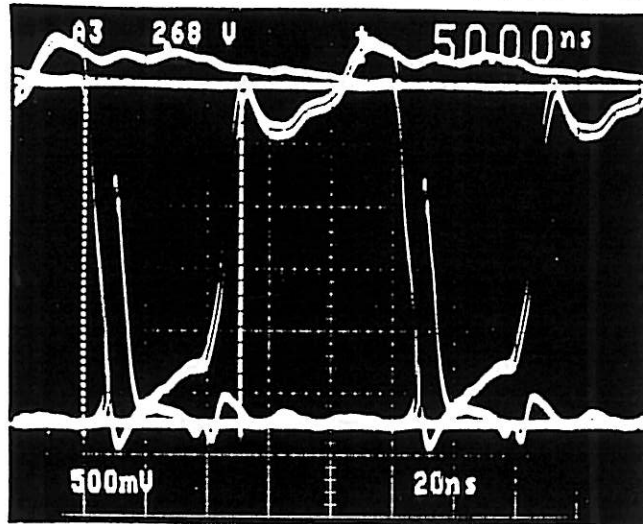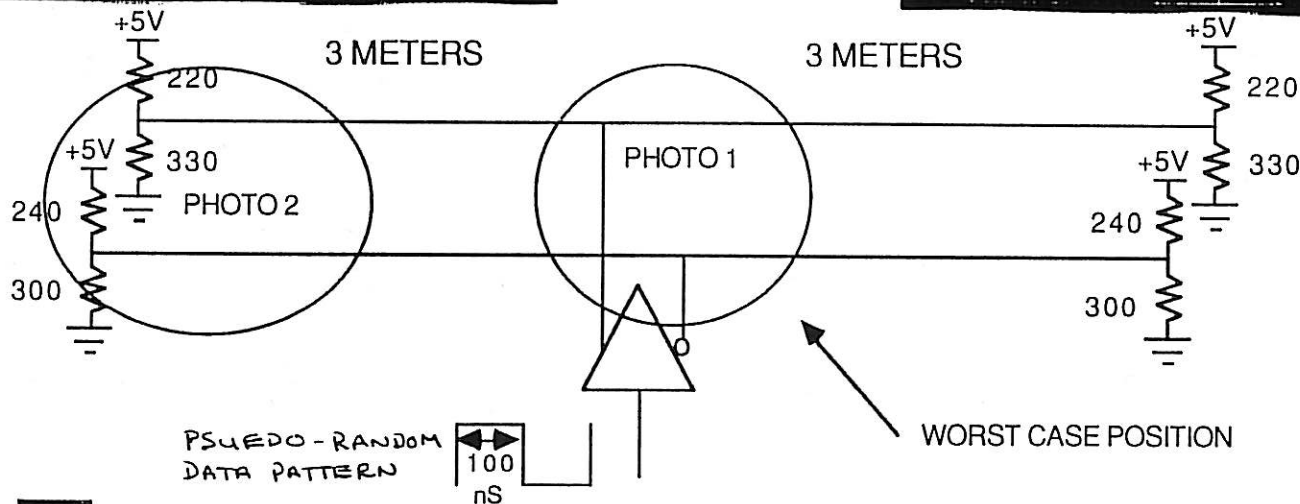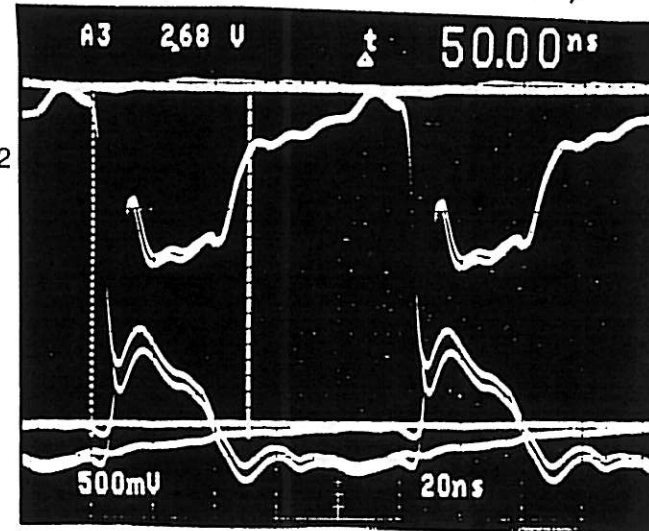## BENCH TEST - FAST SCSI DATA LINE (100nS PULSE WIDTH)

PHOTO 1

PHOTO 2

A3   268 V   5000 ns

500mV   20ns

A3   268 V   50.00 ns

500mV   20ns

← GND →

+5V

220

+5V   330

240   PHOTO 2

300

3 METERS

PHOTO 1

3 METERS

+5V

220

+5V   330

240

300

WORST CASE POSITION

PSUEDO-RANDOM
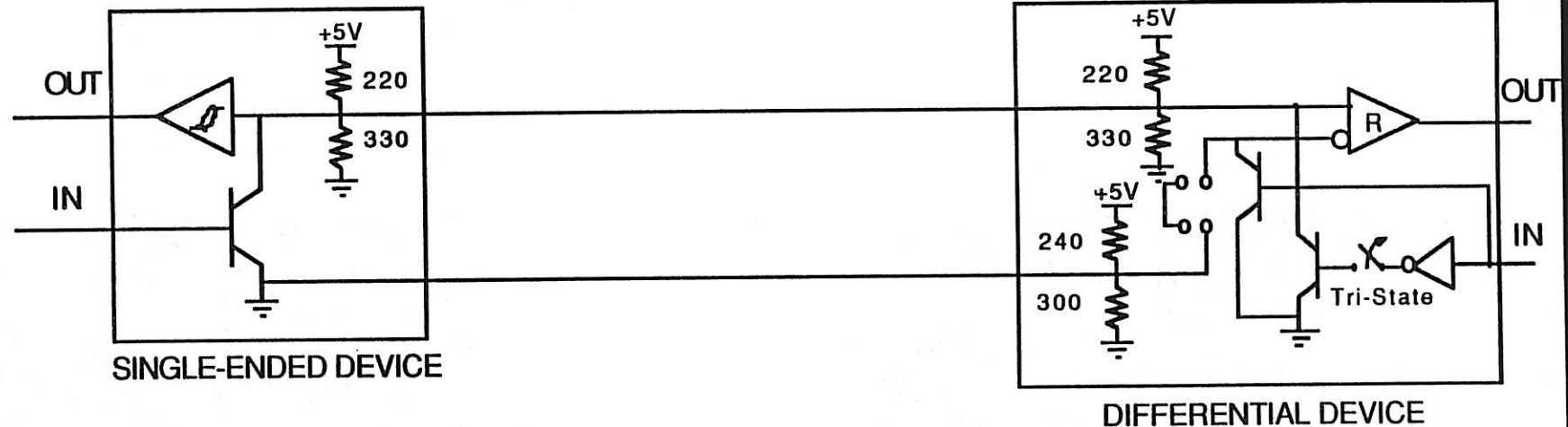DATA PATTERN   ←→
100
nS

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SHORT DISTANCE DIFFERENTIAL SCSI TRANSCEIVER

INTERFACING SINGLE-ENDED TO DIFFERENTIAL SCSI

OUT

+5V
220
330

IN

SINGLE-ENDED DEVICE

+5V
220
330
+5V
240
300

OUT

R

IN

Tri-State

DIFFERENTIAL DEVICE

TO INTERFACE:

1) REMOVE 240/300 TERMINATOR AND REPLACE WITH SHORT TO GROUND.

2) REMOVE JUMPER BETWEEN INVERTING INPUT OF DIFFERENTIAL RECEIVER
   AND 240/300 TERMINATOR.

3) TOO MUCH TERM POWER IF DIFFERENTIAL DEVICE CONNECTED TO SINGLE-ENDED
   DEVICE BEFORE PERFORMING STEPS (1) AND (2) ABOVE?

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