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HIGH ENERGY PHYSICS

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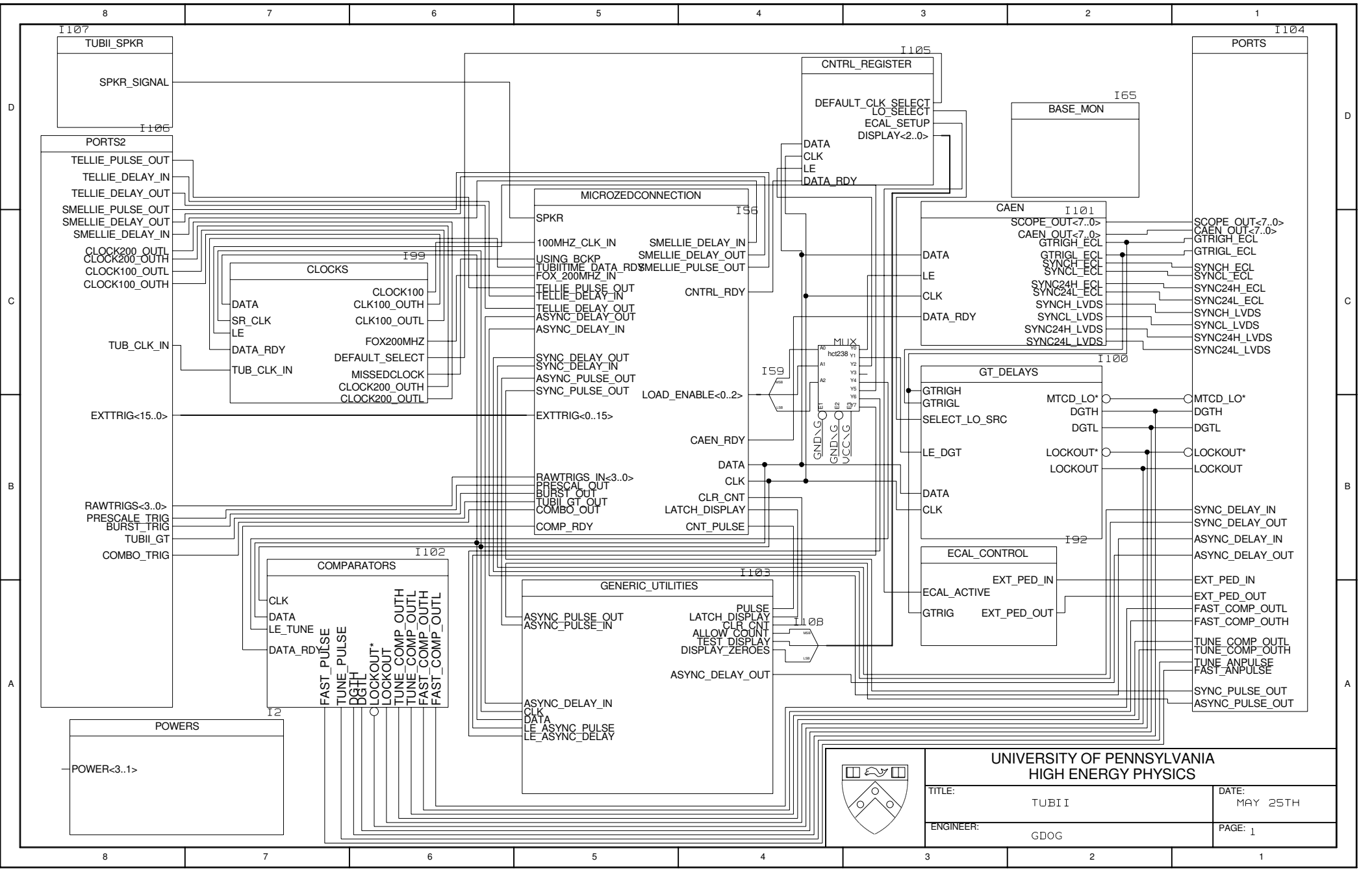
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MAY 25TH
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GDOG
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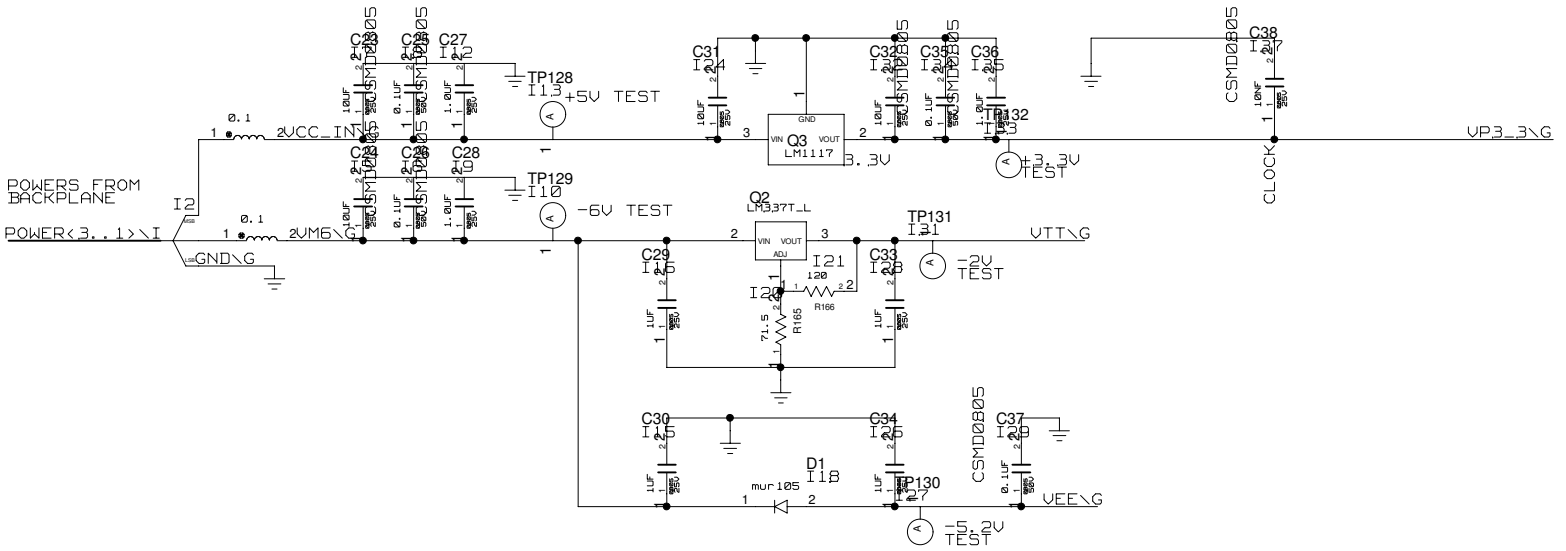
POWERS



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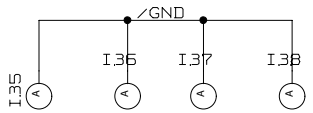
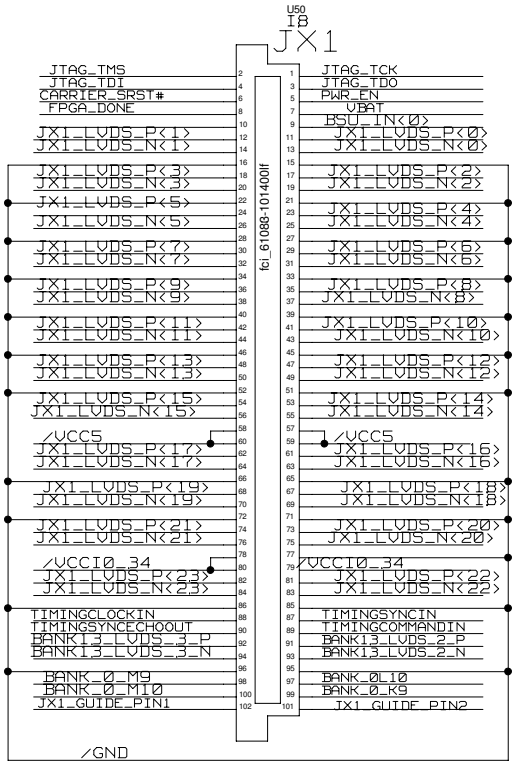
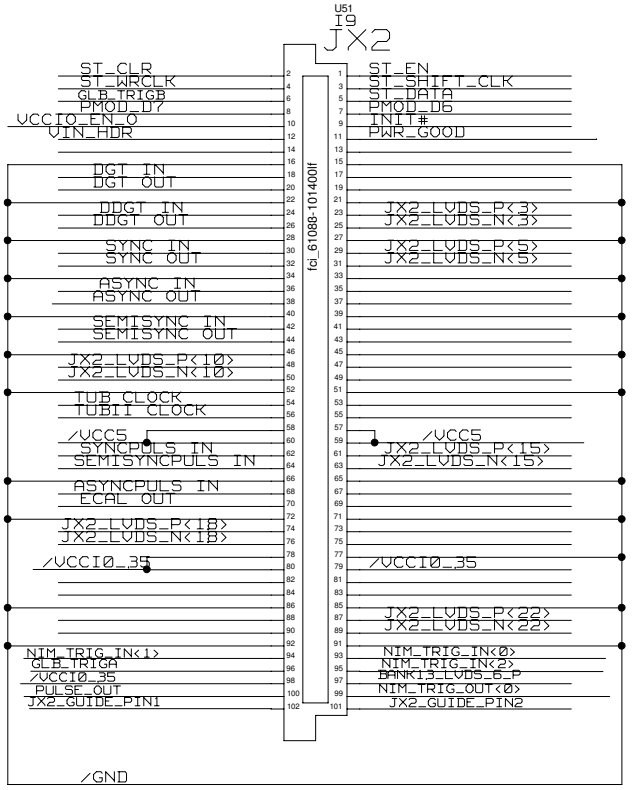
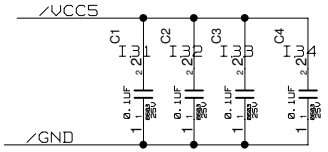
MICROZED CONNECTION









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DRAWING: MICROZED_MOD

TITLE: MICROZED_CONNECTION

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LAST MODIFIED=Wed Oct 08 18:25:04 2014

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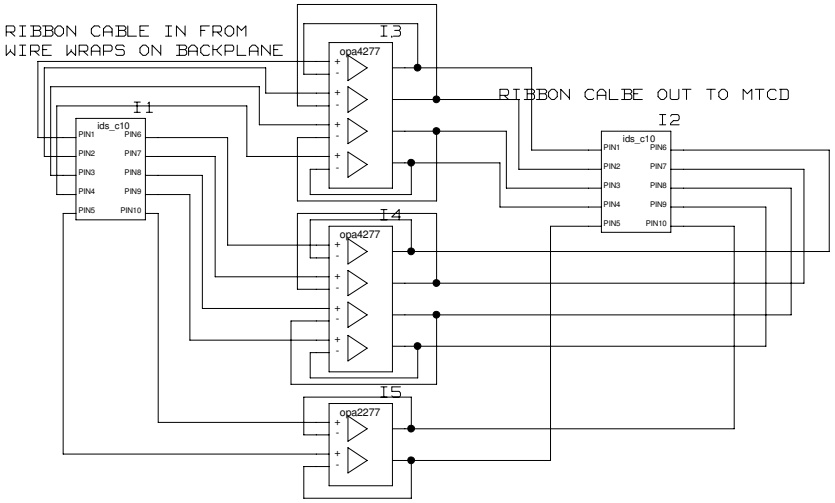
BASELINE MONITORING

SIMPLY MAKES SURE THERE
IS A BUFFER BETWEEN THE MTCD
AND BACKPLANE.
TO PREVENT NOISE PROPAGATION



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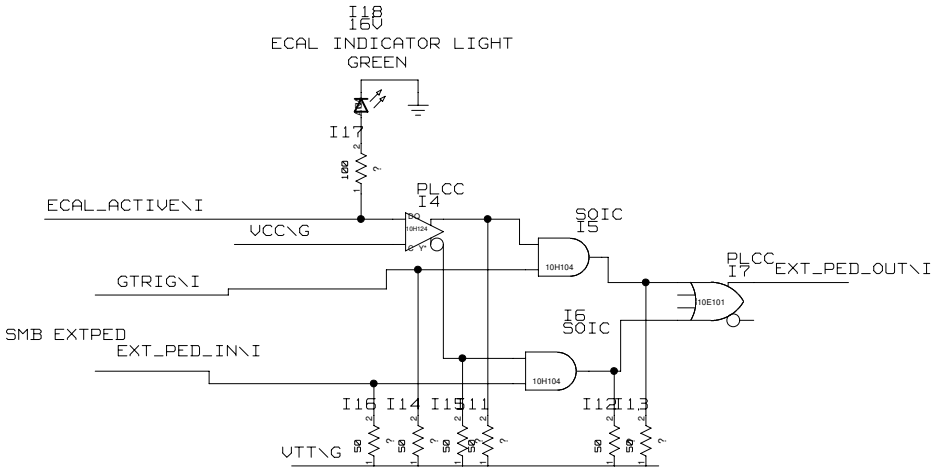
TITLE: BASELINE MONITORING	DATE: 9/8/14
ENGINEER: ERIC M	PAGE: 4

ECAL CONTROL

WHEN PERFORMING ECALS GTRIG FEEDS INTO THE EXT_PED
ON THE MTCD. OTHERWISE THE MTCD'S EXT_PED COMES FROM
TUBII'S EXT_PED



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TITLE: ECAL CONTROL		DATE: 9/19/14
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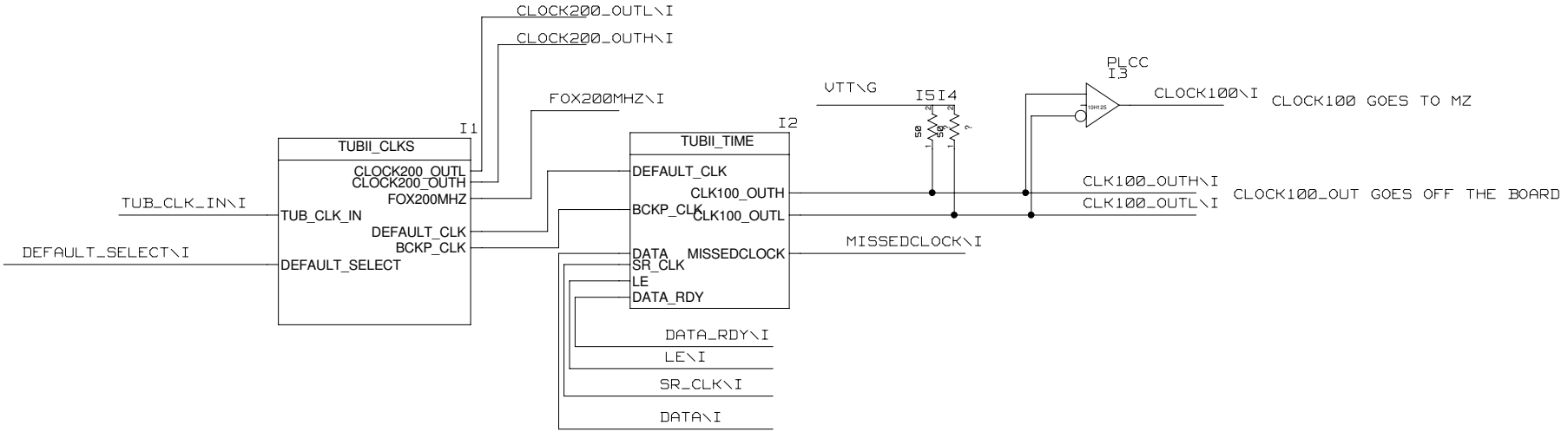
CLOCKS

ALL THINGS CLOCK RELATED



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TITLE: CLOCKS	DATE: 9/24/14
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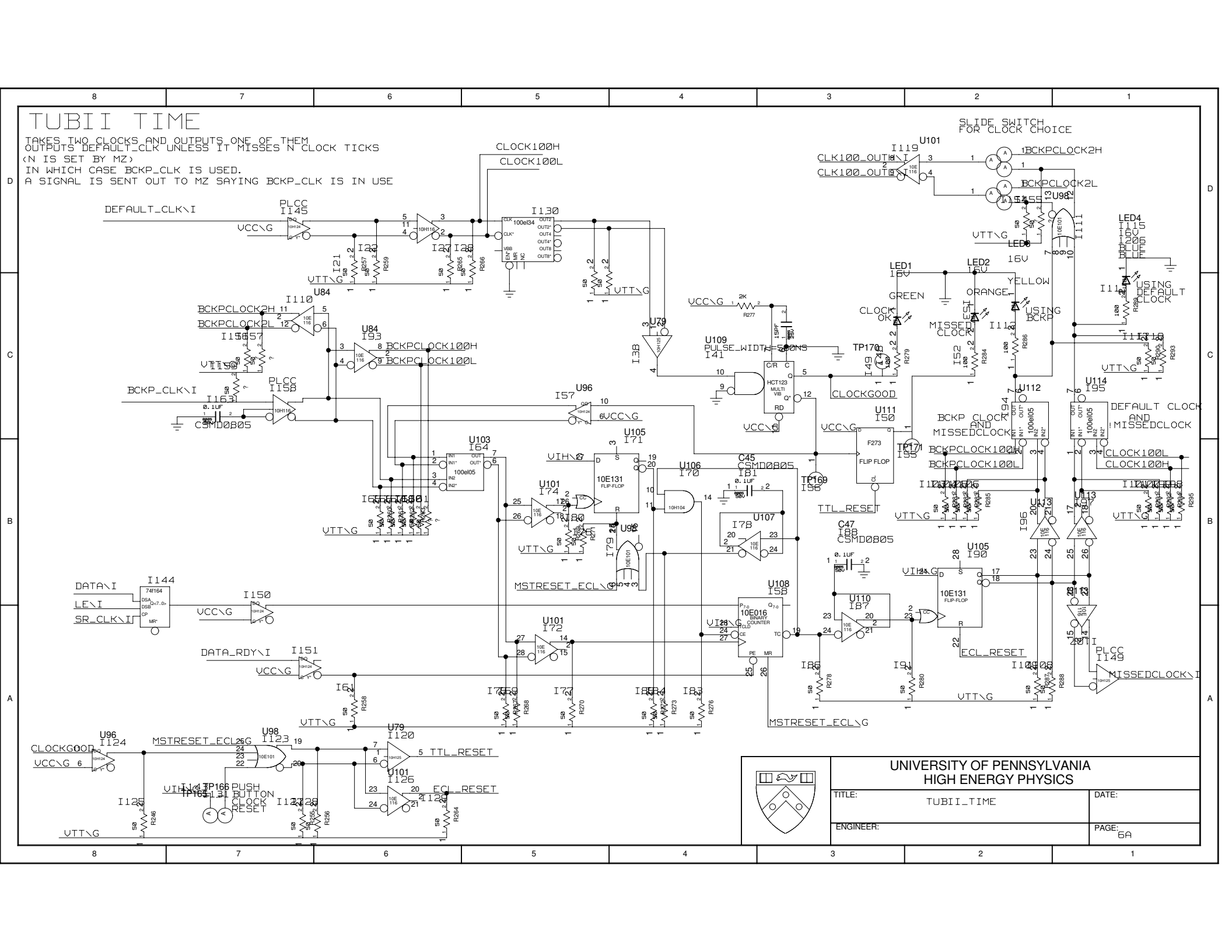
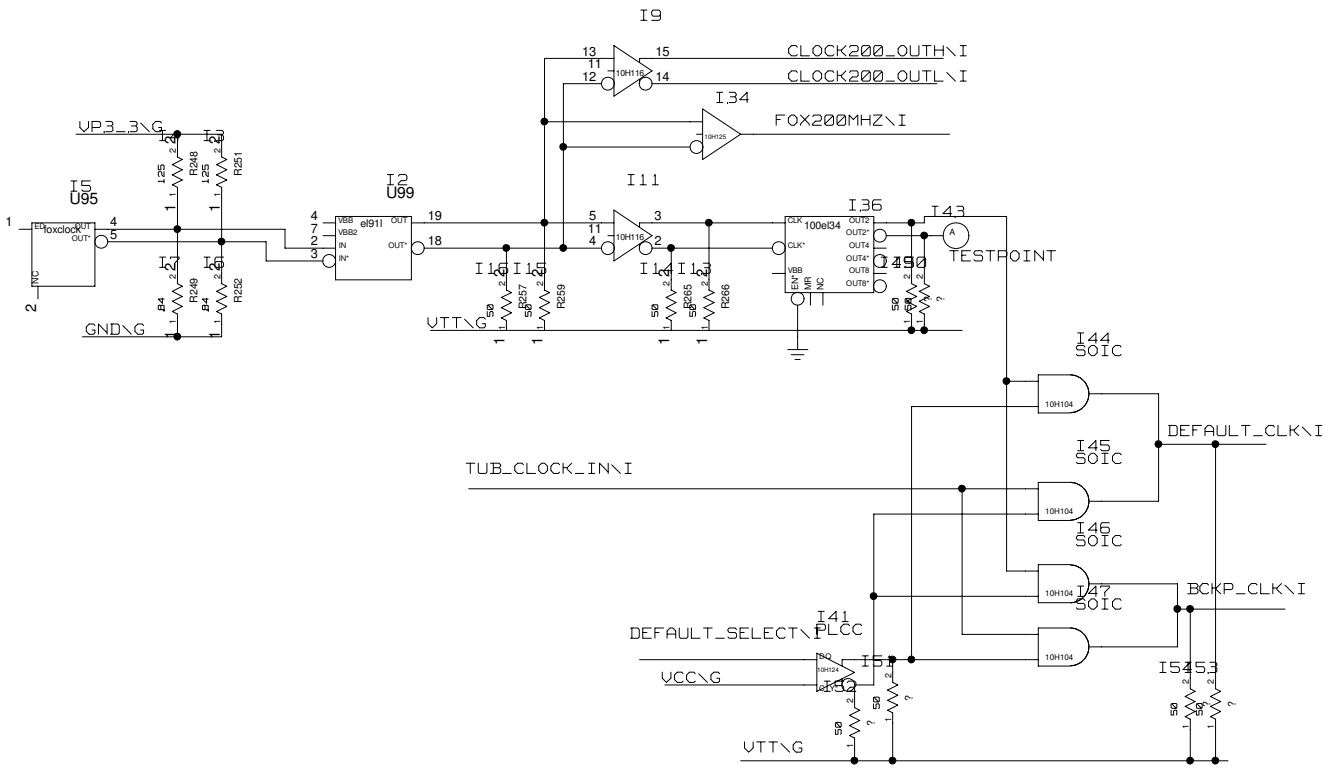
TUBII TIME

TAKES TWO CLOCKS AND OUTPUTS ONE OF THEM
OUTPUTS DEFAULT_CLK UNLESS IT MISSES N CLOCK TICKS
<N IS SET BY MZ>
IN WHICH CASE BCKP_CLK IS USED.
A SIGNAL IS SENT OUT TO MZ SAYING BCKP_CLK IS IN USE



TUBII CLOCK SELECT

DECIDES WHICH CLOCK (TUB OR FOX) IS
THE DEFAULT CLOCK AND WHICH IS THE BACKUP



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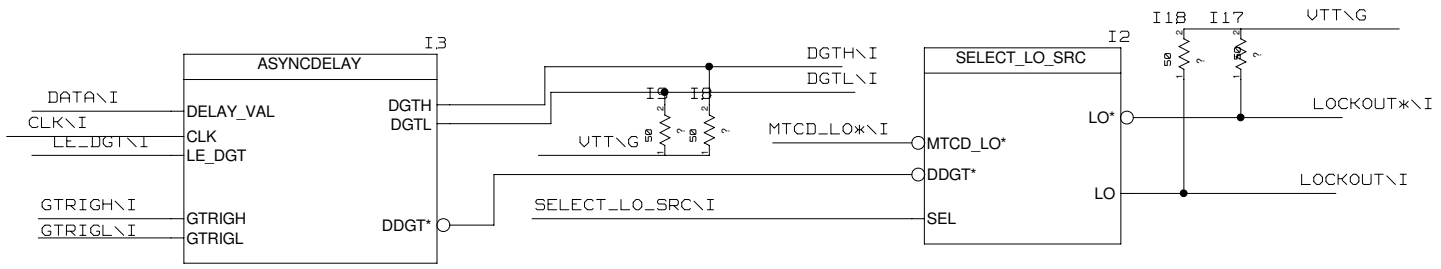
ENGINEER: ERIC M	PAGE: 6B

GT DELAYS

CIRCUITRY DEALING WITH CREATING DGT AND DDGT FROM GT
AND ALSO DECIDES WHAT THE SOURCE OF LO* IS



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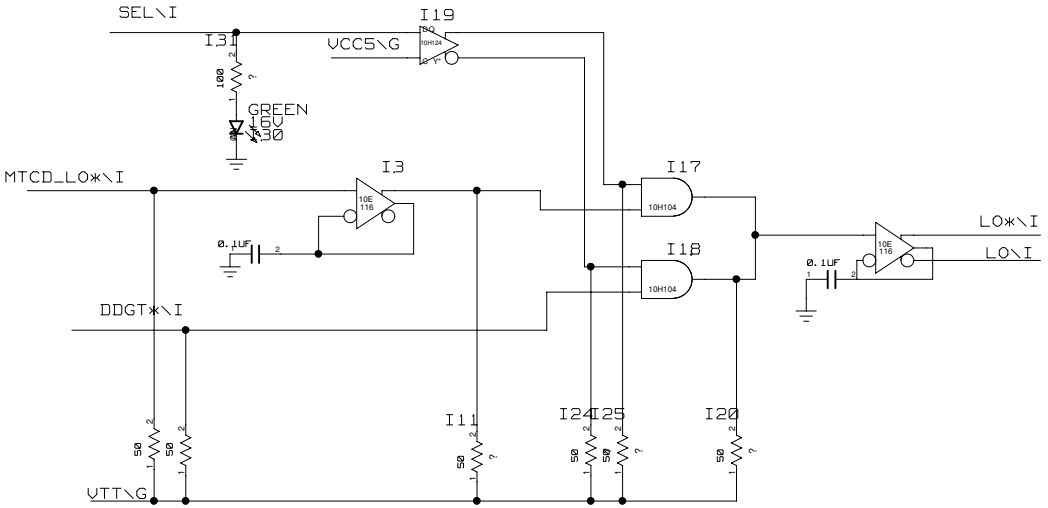
TITLE: GT_DELAYS	DATE: 10/3/14
ENGINEER: ERIC M	PAGE: 7

SELECT LOCKOUT SOURCE

IN THIS BRAVE NEW TUBII WORLD LO* WILL JUST BE DDGT IN GENERAL
BUT PERHAPS PEOPLE WILL WANT TO USE THE MTCD'S LO*

THIS BLOCK PROVIDES USERS WITH THE ABILITY TO SELECT WHERE
THEIR LO* COMES FROM,



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TITLE: SELECT LOCKOUT SOURCE	DATE: 9/11/14
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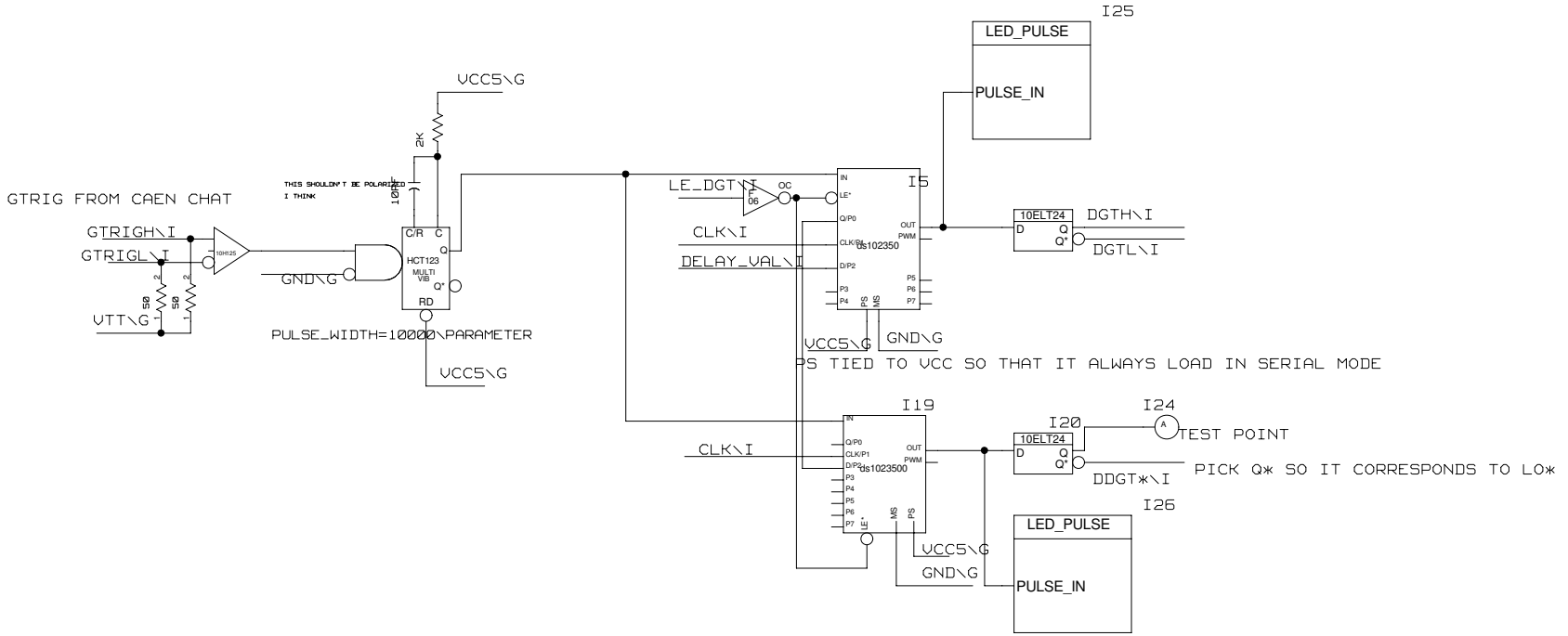
ASYNCHRONOUS DELAY

0 - 127.5 NS DELAY IN 0.5NS STEPS AND 0 - 1275 NS DELAY IN 5 NS STEPS

THE TWO DELAYS ARE DAISY CHAINED TOGETHER
SO THEY'RE PROGRAMMED LIKE ONE 16 BIT REGISTER



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TITLE: ASYNC DELAY	DATE:
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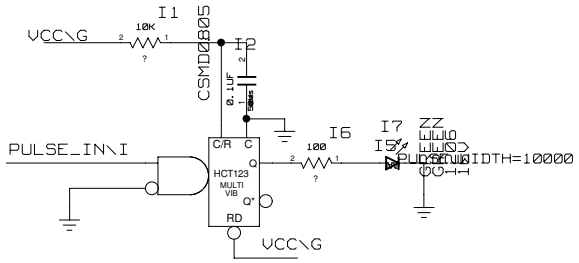
LED PULSE

TAKES AN INPUT PULSE
STRETCHES IT AND FLASHES AN LED



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TITLE: LED PULSE		DATE: 10/7/14
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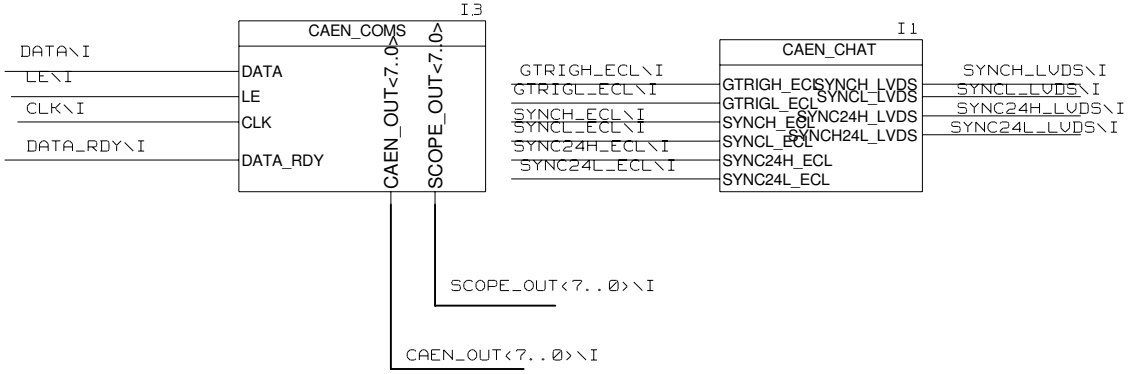
CAEN

HANDLES COMMUNICATION WITH THE CAEN DIGITSER
DECIDES WHICH ANALOG SIGNALS GET SENT TO CAEN
AND SENDS SYNC/SYNC24 /GT TO CAEN

HERE IS WHERE A VARIETY OF
ANALOG SIGNALS ARE CHOSEN
TO GO TO THE CAEN



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TITLE: CAEN	DATE: 9/25/14
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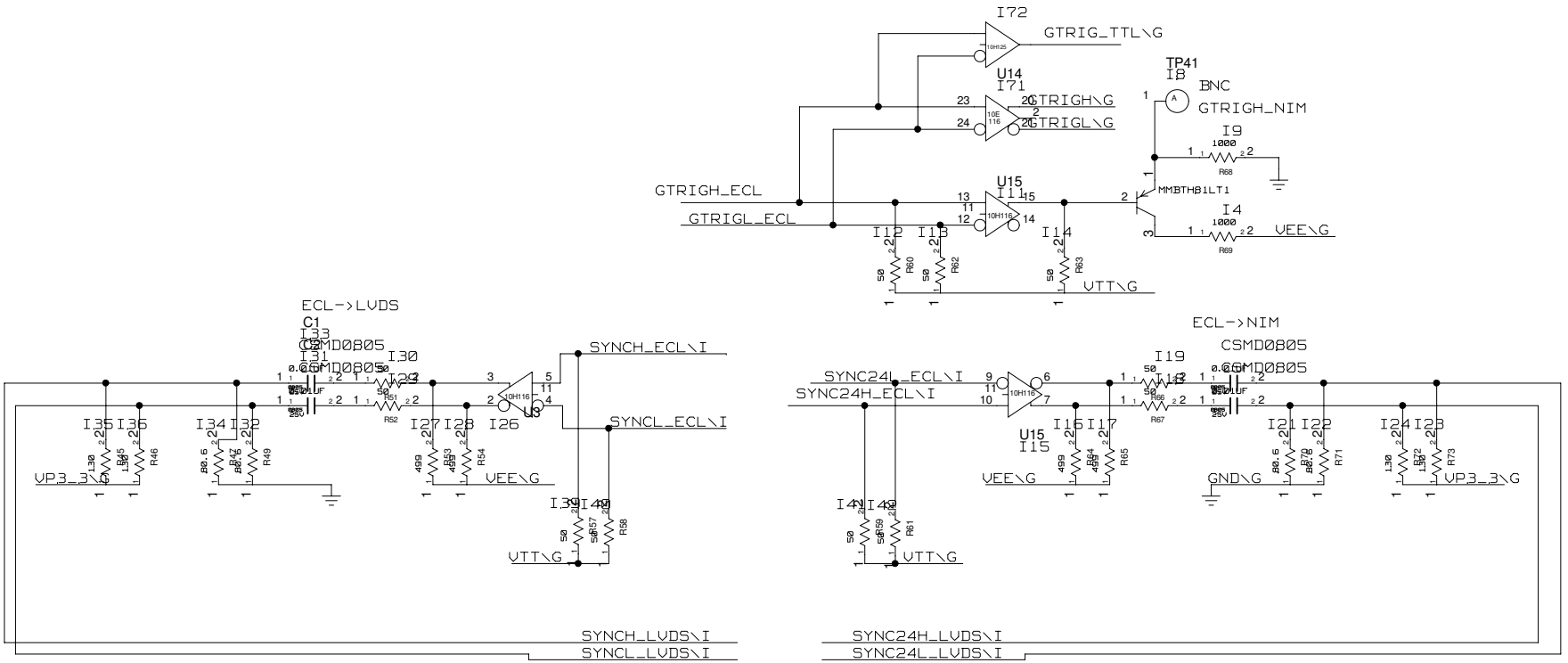
CAEN_CHAT

SENDS DIGITAL SIGNALS TO CAEN
AFTER TRANSLATING THEM APPROPRIATELY



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TITLE: CAEN_CHAT	DATE:
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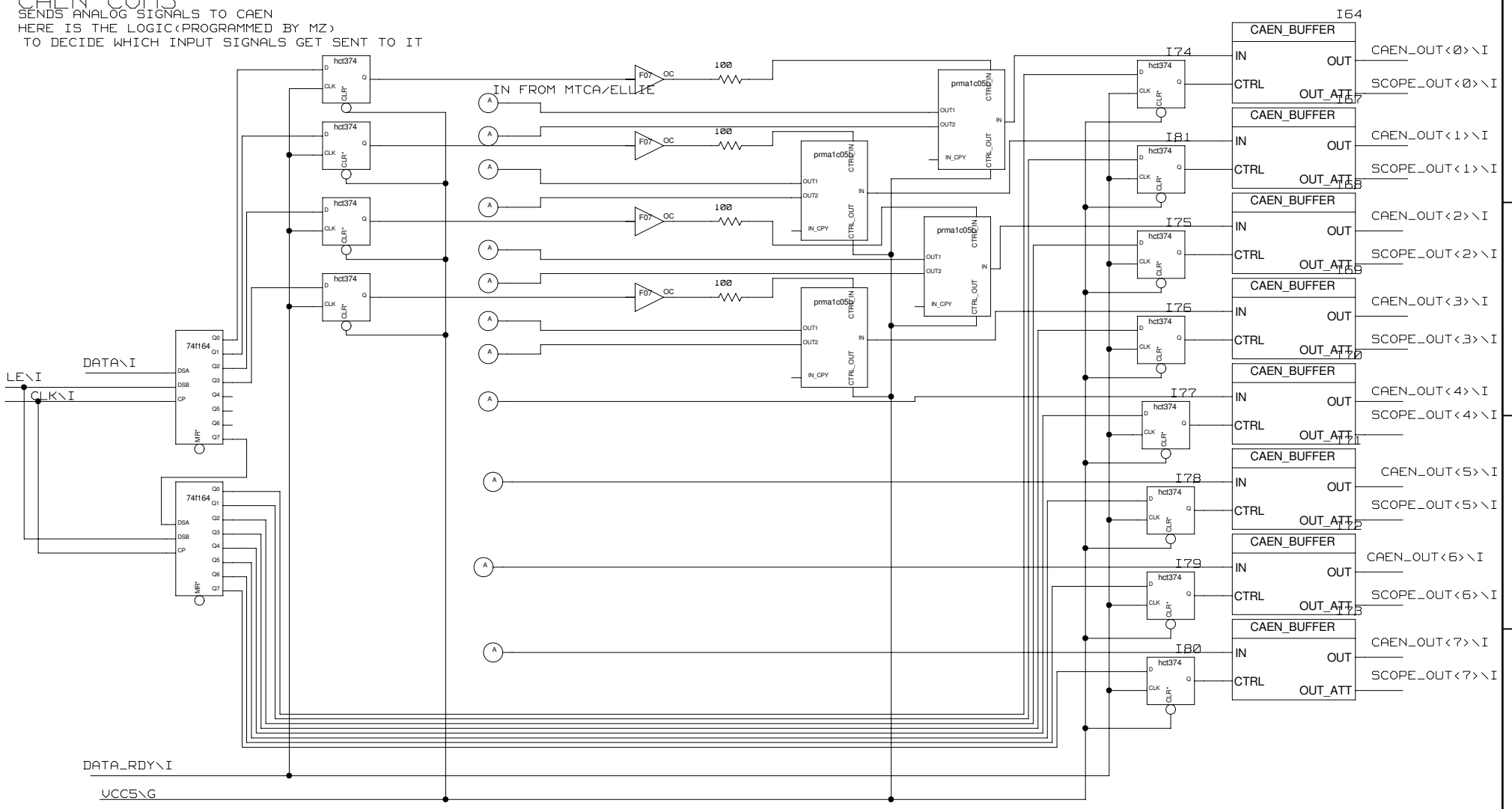
CAEN COMS

SENDS ANALOG SIGNALS TO CAEN
HERE IS THE LOGIC(PROGRAMMED BY MZ)
TO DECIDE WHICH INPUT SIGNALS GET SENT TO IT



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CAEN_COMS	9/4/14
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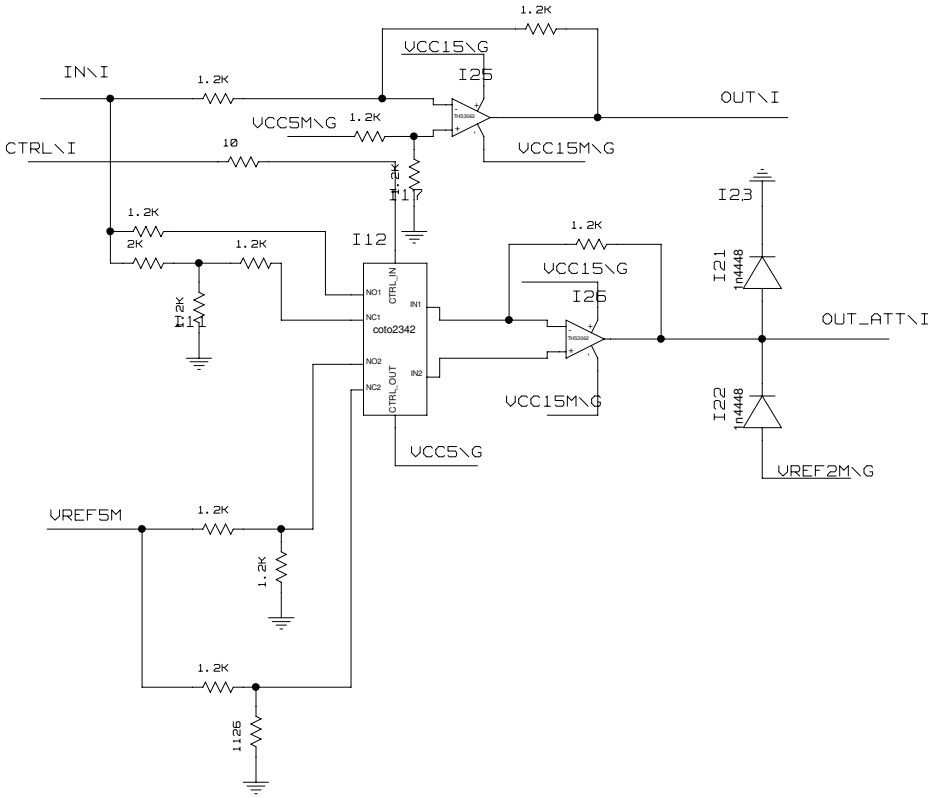
CAEN BUFFER

THE CAEN IS A PICKY BEAST
THIS CIRCUIT CLIPS A SIGNAL SO THAT IT CAN BE USED BY THE CAEN
AND BUFFERS IT FOR GOING TO THE SCOPE



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TITLE: CAEN_BUFFER	DATE: 8/18/14
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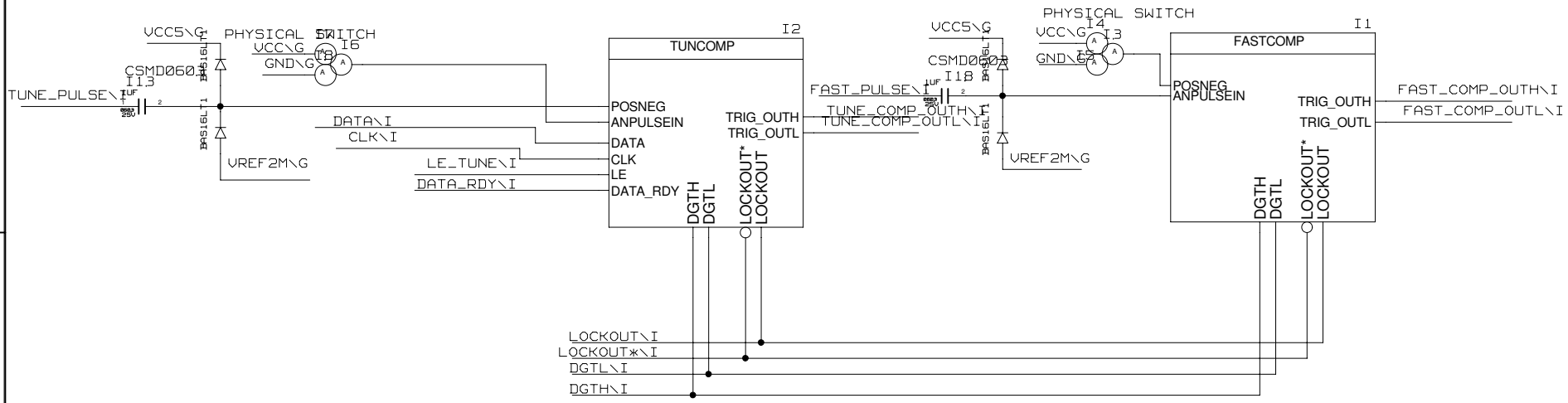
COMPARATORS

THERE ARE TWO COMPARATORS WHICH AN ANALOG SIGNAL
CAN BE COMPARED TO A TUNEABLE THRESHOLD.
THE DIFFERENCE BETWEEN THE TWO IS ONE IS FASTER AND
IT'S THRESHOLD IS SET BY A POT. THE OTHER IS SET BY A DAC



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TITLE: COMPARATORS	DATE: 9/25/14
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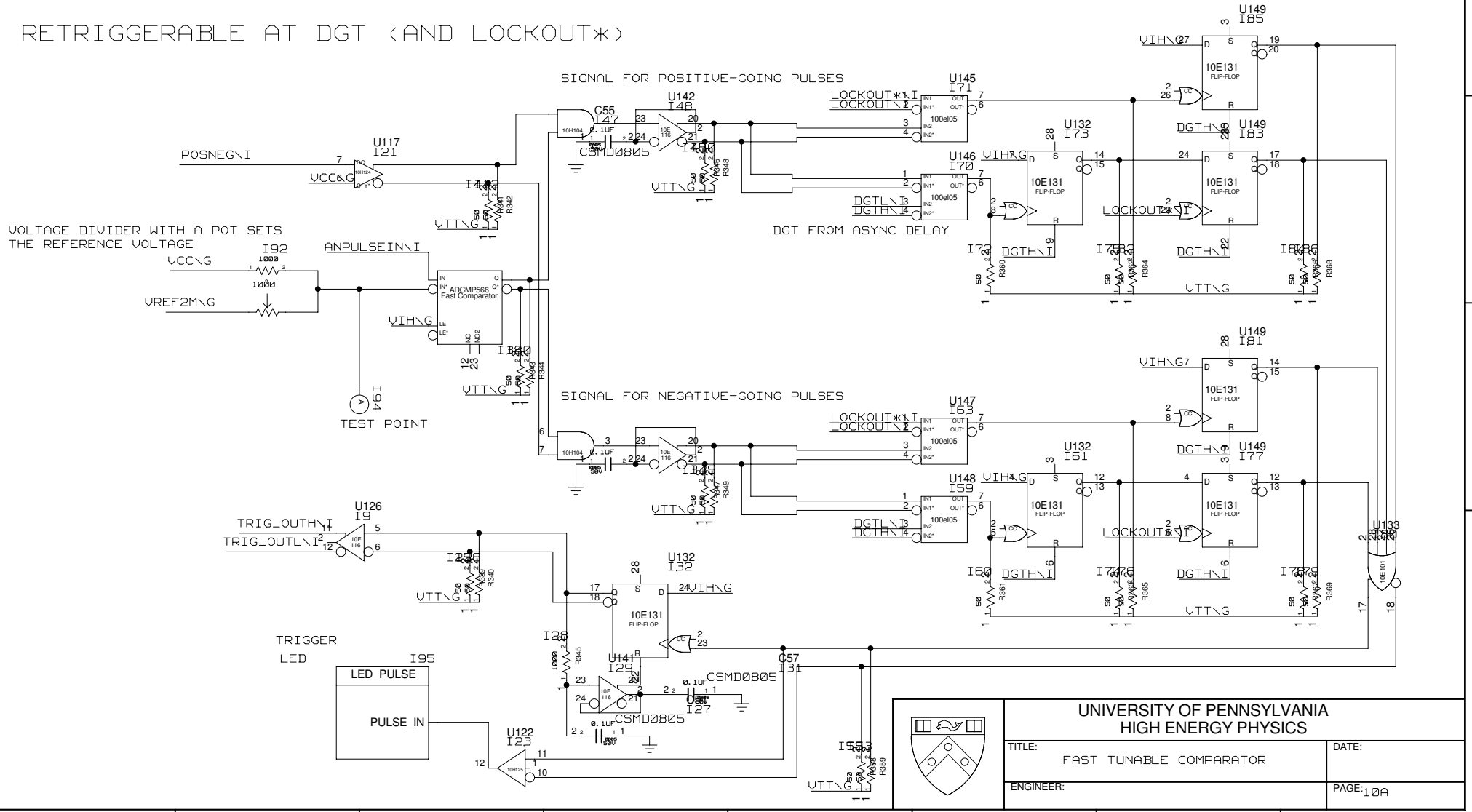
EXTRA SPEEDY TUNABLE COMPARATOR CIRCUIT
RANGE: −2.0 TO +3 V; 4.25 NS DELAY (250PS FROM COMPARATOR)

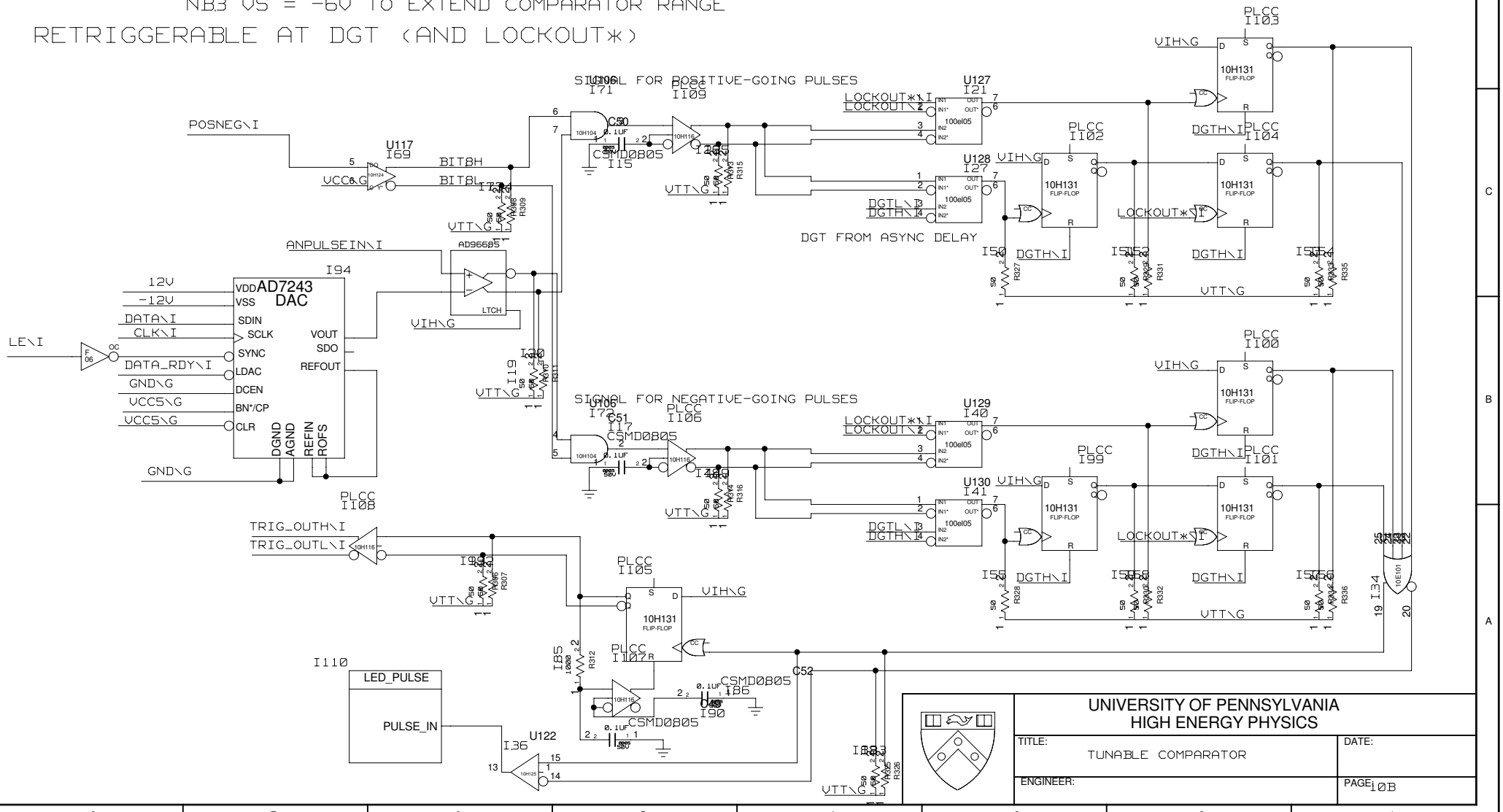


TUNABLE COMPARATOR CIRCUIT
RANGE: −3.3 TO +5 V;

NB2 VDD = +15V VSS = −15V TO SUPPLY DAC
NB3 VS = −6V TO EXTEND COMPARATOR RANGE

RETRIGGERABLE AT DGT (AND LOCKOUT*)

NOTE FROM ERIC:
THIS IS PROBABLY NO LONGER TRUE
I CHANGED 10ES TO 10HS



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TITLE: TUNABLE COMPARATOR	DATE:
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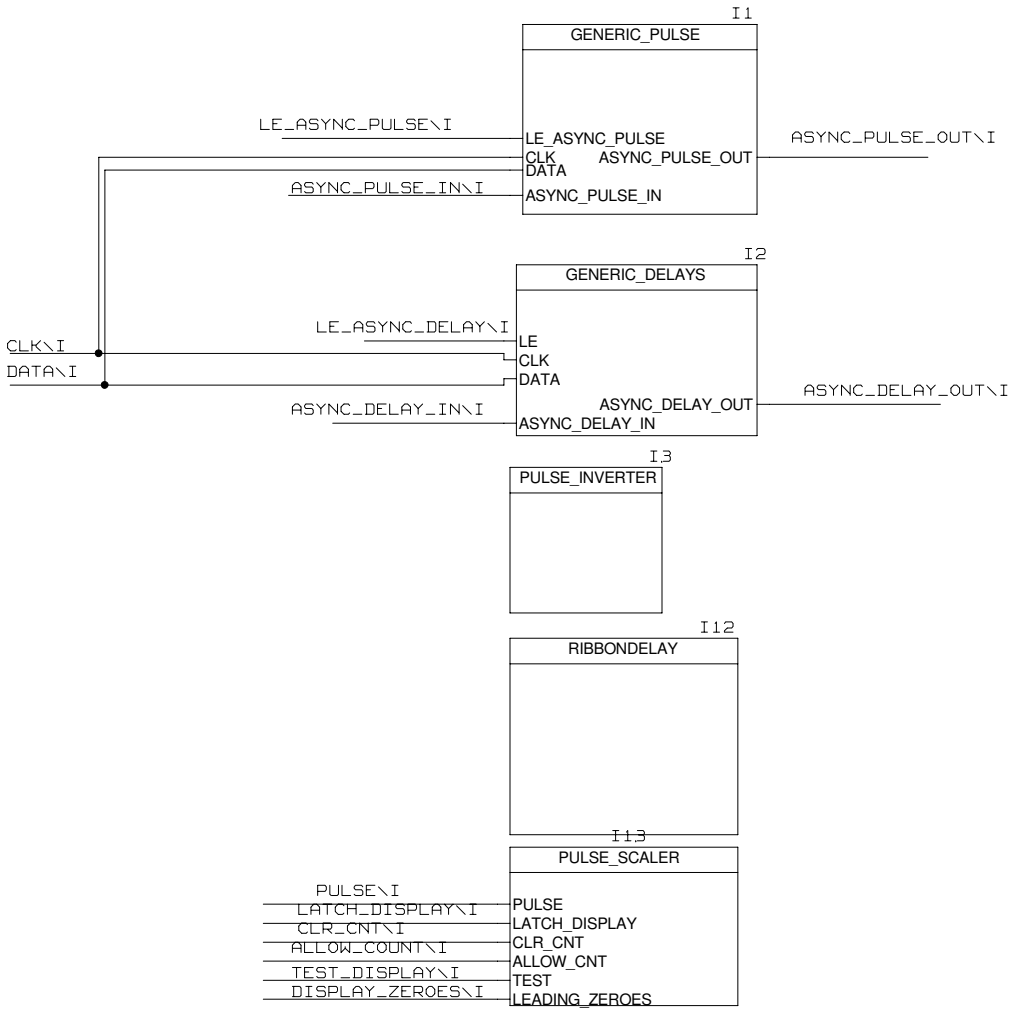
GENERIC UTILITIES

PART OF TUBII'S MISSION IS TO PROVIDE
HELPFUL FUCNTIONALITY TO IT'S USERS.
HERE IS THE HOUSING FOR ALL CIRCUITRY DESIGNED
WITH NO PURPOSE IN MIND EXCEPT FOR THAT
SOMEBODY SOMEDAY MIGHT WANT TO DO SOMETHING



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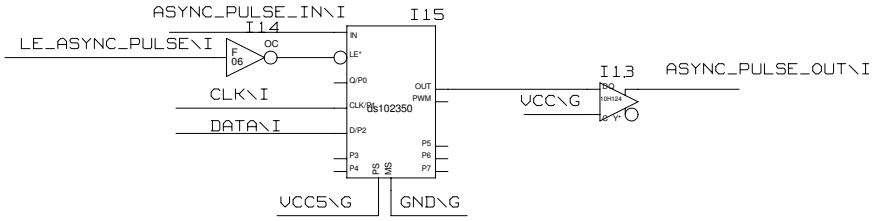
GENERIC PULSE

A PULSE COMES FROM THE MZ AT SOME RATE.
THIS CIRCUIT OFF SETS THAT RATE BY SOME SMALL
ASYNCHROUNOUS AMOUNT.



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TITLE: GENERIC PULSE	DATE:
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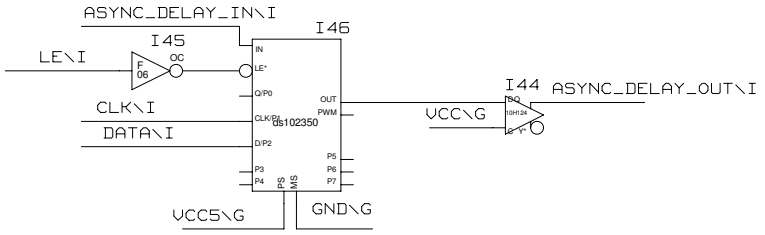
GENERIC DELAYS

SIMPLY DELAYS AN INCOMING
PULSE BY SOME TUNEABLE
ASYNCHRONOUSE AMOUNT



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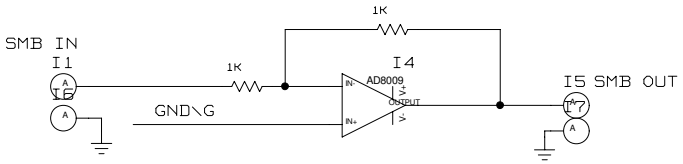
PULSE INVERTER



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TITLE: PULSE_INVERTER	DATE: 9/8/14
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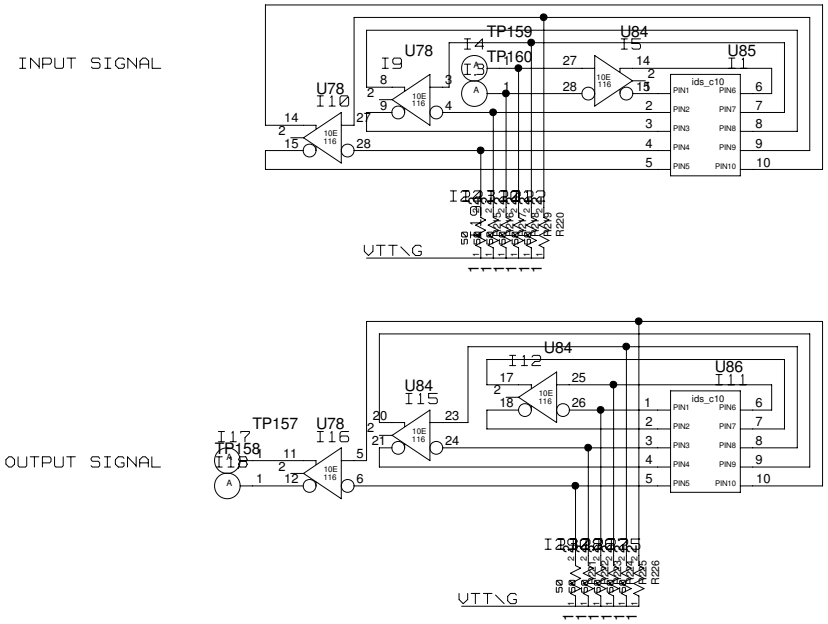
RIBBON-CABLE DELAY



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TITLE: RIBBON DELAY	DATE:
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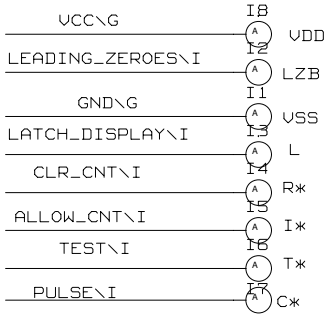
PULSE SCALER

OUTPUTS GO TO A DISPLAY THAT'S MOUNTED ON THE FRONT PANEL



TEST POINTS WITH WIRES
THAT GO TO THE FRONT PANEL

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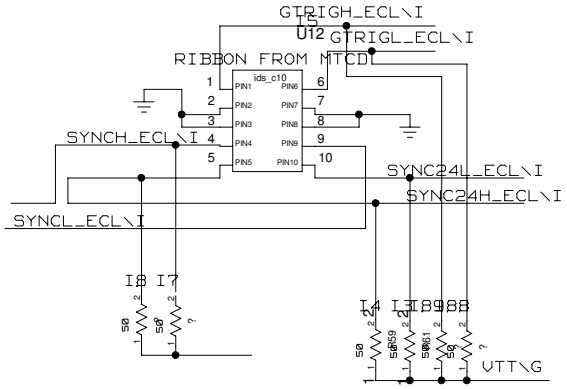
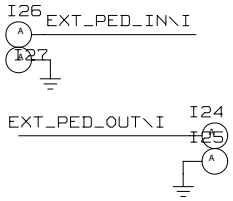
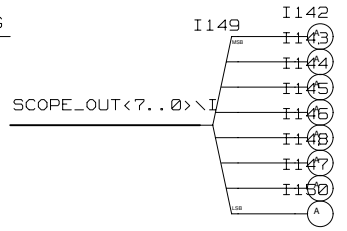
TITLE: PULSE_SCALER		DATE: 10/2/14
ENGINEER: ERIC M		PAGE: 11E

PORTS

PORTS IN/OUT OF TUBII







I151

TRANSLATORS

I152

CAEN_PORTS	
CAEN_OUT<7..0>\I	CAEN_OUT<7..0>
SYNCH_LVDS\I	SYNCH_LVDS
SYNCL_LVDS\I	SYNCL_LVDS
SYNC24H_LVDS\I	SYNC24H_LVDS
SYNC24L_LVDS\I	SYNC24L_LVDS

I153

COMPARATOR_PORTS	
TUNE_COMP_OUTH\I	TUNE_COMP_OUTH
TUNE_COMP_OUTL\I	TUNE_COMP_OUTL
FAST_COMP_OUTH\I	FAST_COMP_OUTH
FAST_COMP_OUTL\I	FAST_COMP_OUTL
FAST_ANPULSE\I	FAST_ANPULSE
TUNE_ANPULSE\I	TUNE_ANPULSE

I155

GT_DELAYS_PORTS	
DGTH\I	DGTH
DGTL\I	DGTL
LOCKOUT*\I	LOCKOUT*
LOCKOUT\I	LOCKOUT
MTCD_LO*\I	MTCD_LO*

I154

GENERIC_UTILITIES_PORTS	
SYNC_PULSE_OUT\I	SYNC_PULSE_OUT
ASYNC_PULSE_OUT\I	ASYNC_PULSE_OUT
SYNC_DELAY_IN\I	SYNC_DELAY_IN
ASYNC_DELAY_IN\I	ASYNC_DELAY_IN
SYNC_DELAY_OUT\I	SYNC_DELAY_OUT
ASYNC_DELAY_OUT\I	ASYNC_DELAY_OUT

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TITLE: PORTS	DATE: 9/26/14
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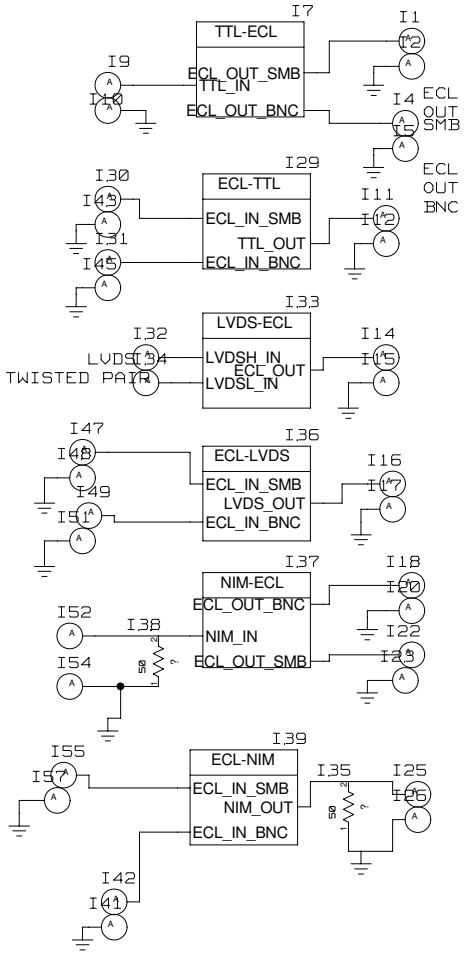
TRANSLATORS



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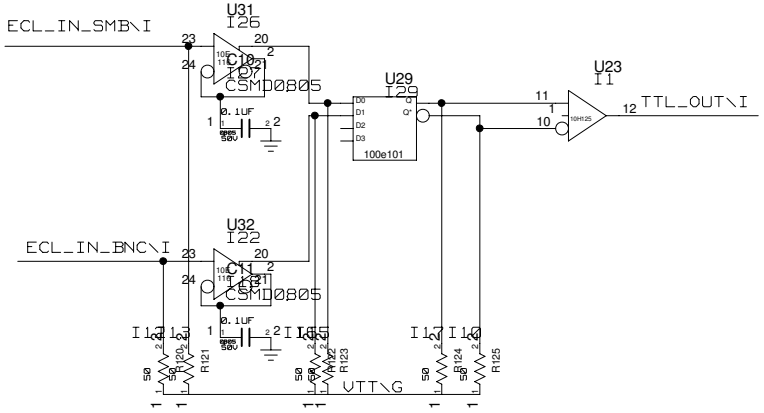
TITLE: TRANSLATORS	DATE: 10/9/14
ENGINEER: ERIC M	PAGE:

ECL-TTL



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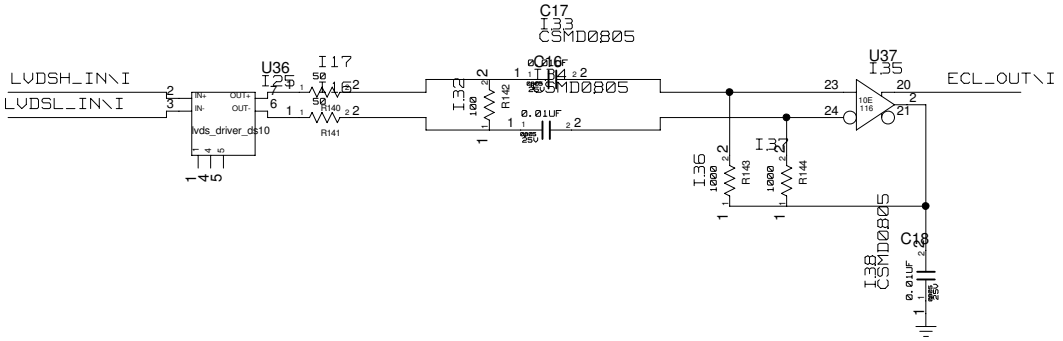
TITLE: ECL-TTL CONVERSION	DATE:
ENGINEER:	PAGE: 12F

LVDS-ECL



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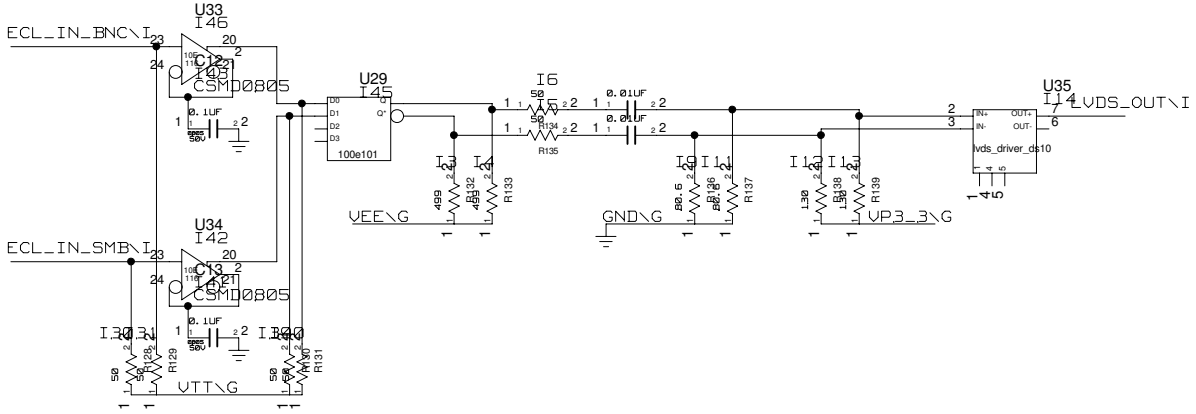
HIGH ENERGY PHYSICS

TITLE: LVDS-ECL CONVERSION	DATE:
ENGINEER:	PAGE: 12B

ECL-LVDS



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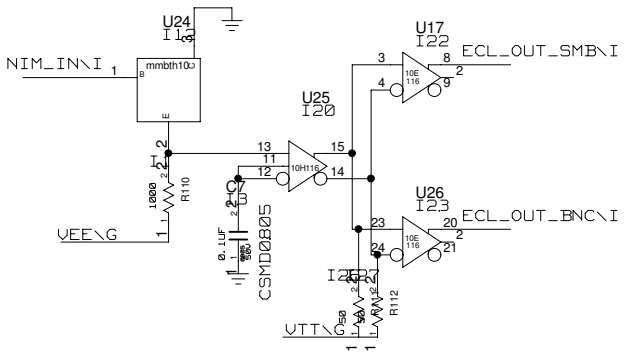
TITLE: ECL-LVDS CONVERSION	DATE:
ENGINEER:	PAGE: 12C

NIM-ECL



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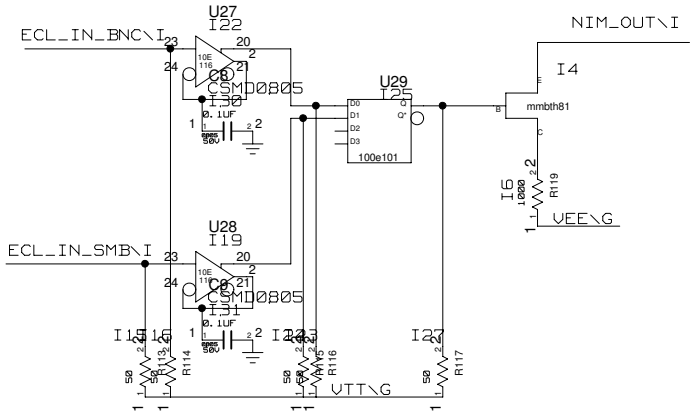
TITLE: NIM-ECL CONVERSION	DATE:
ENGINEER:	PAGE: 12A

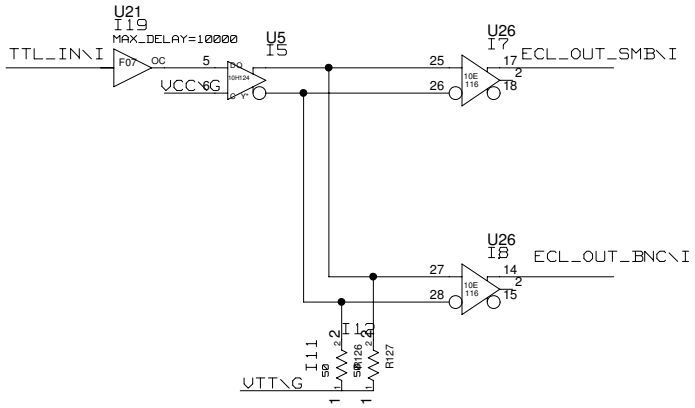
ECL-NIM



UNIVERSITY OF PENNSYLVANIA
HIGH ENERGY PHYSICS

TITLE: ECL-NIM CONVERSION	DATE:
ENGINEER:	PAGE: 12D

TTL-ECL



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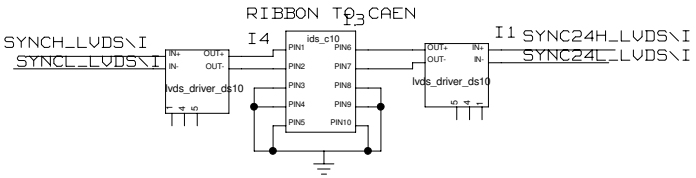
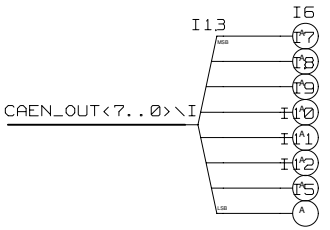
HIGH ENERGY PHYSICS

TITLE: TTL-ECL CONVERSION	DATE:
ENGINEER:	PAGE: 12E

CAEN PORTS

OUTPUTS THAT GO TO THE CAEN BOARD





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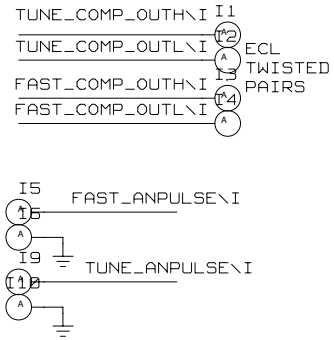
TITLE: CAEN_PORTS	DATE: 10/9/14
ENGINEER: ERIC M	PAGE: 12G

COMPARATOR PORTS

SIGNALS TO & FROM THE TUNE/FAST COMPARATOR



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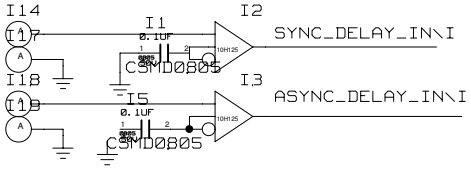
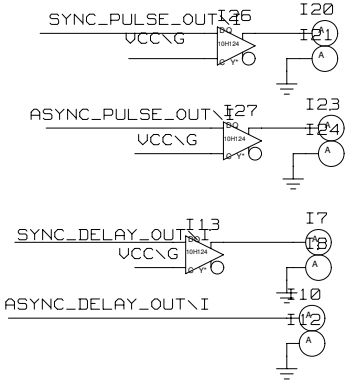
HIGH ENERGY PHYSICS

TITLE: COMPARATOR PORTS	DATE: 10/9/14
ENGINEER: ERIC M	PAGE: 12H

GENERIC UTILITIES PORTS

PORTS TO/FROM THE TUBII
THAT ARE FOR GENERIC PURPOSES





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TITLE: GENERIC_UTILITIES_PORTS	DATE: 10/9/14
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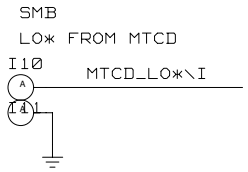
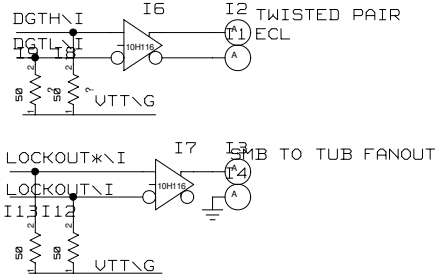
GT_DELAYS_PORTS

PORTS TO/FROM TUBII THAT ARE USED BY THE GT DELAYS SYSTEM





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TITLE: GT DELAYS PORTS		DATE: 10/9/14
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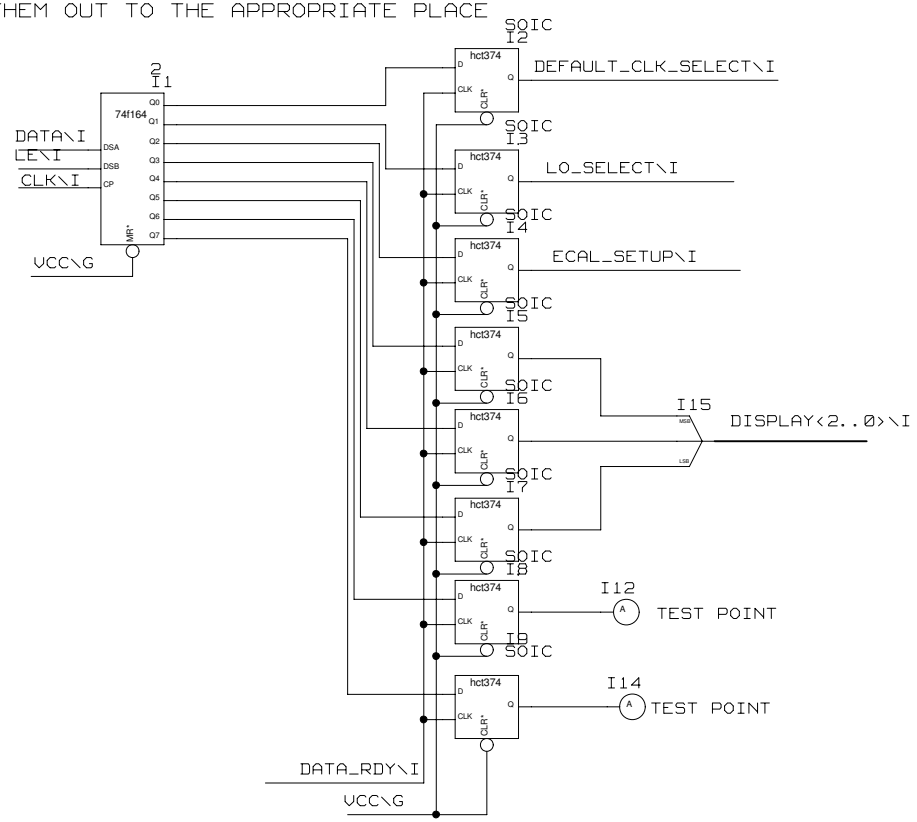
CNTRL REGISTER

ANY SET-IT-AND-FORGET-IT TYPE SIGNALS
GET LOADED INTO A SHIFT REGISTER WHICH
SENDS THEM OUT TO THE APPROPRIATE PLACE



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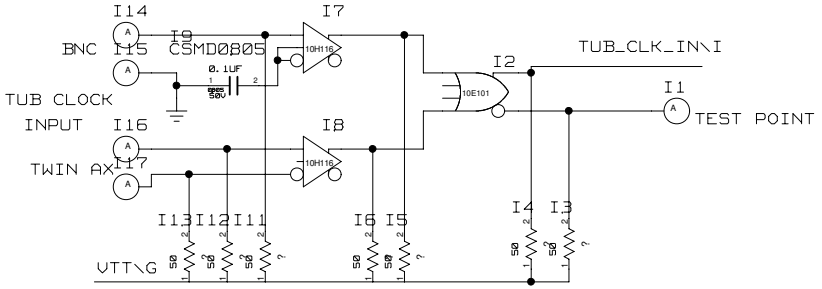
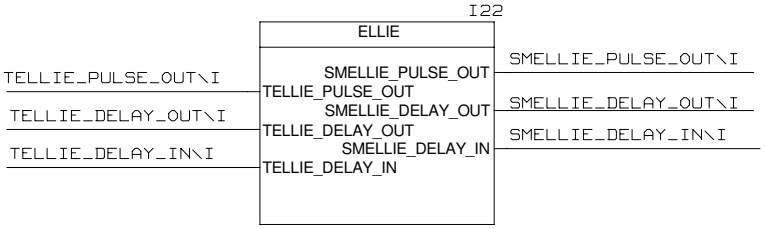
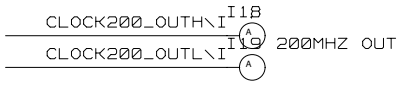
TITLE: CNTRL_REGISTER	DATE: 9/30/14
ENGINEER: ERIC M	PAGE: 13

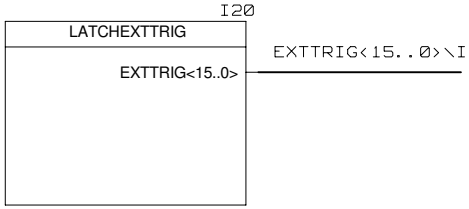
PORTS2

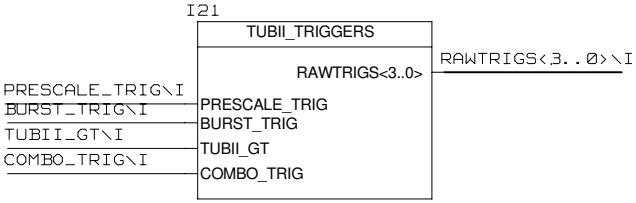
PORTS IN TO & OUT OF TUBII











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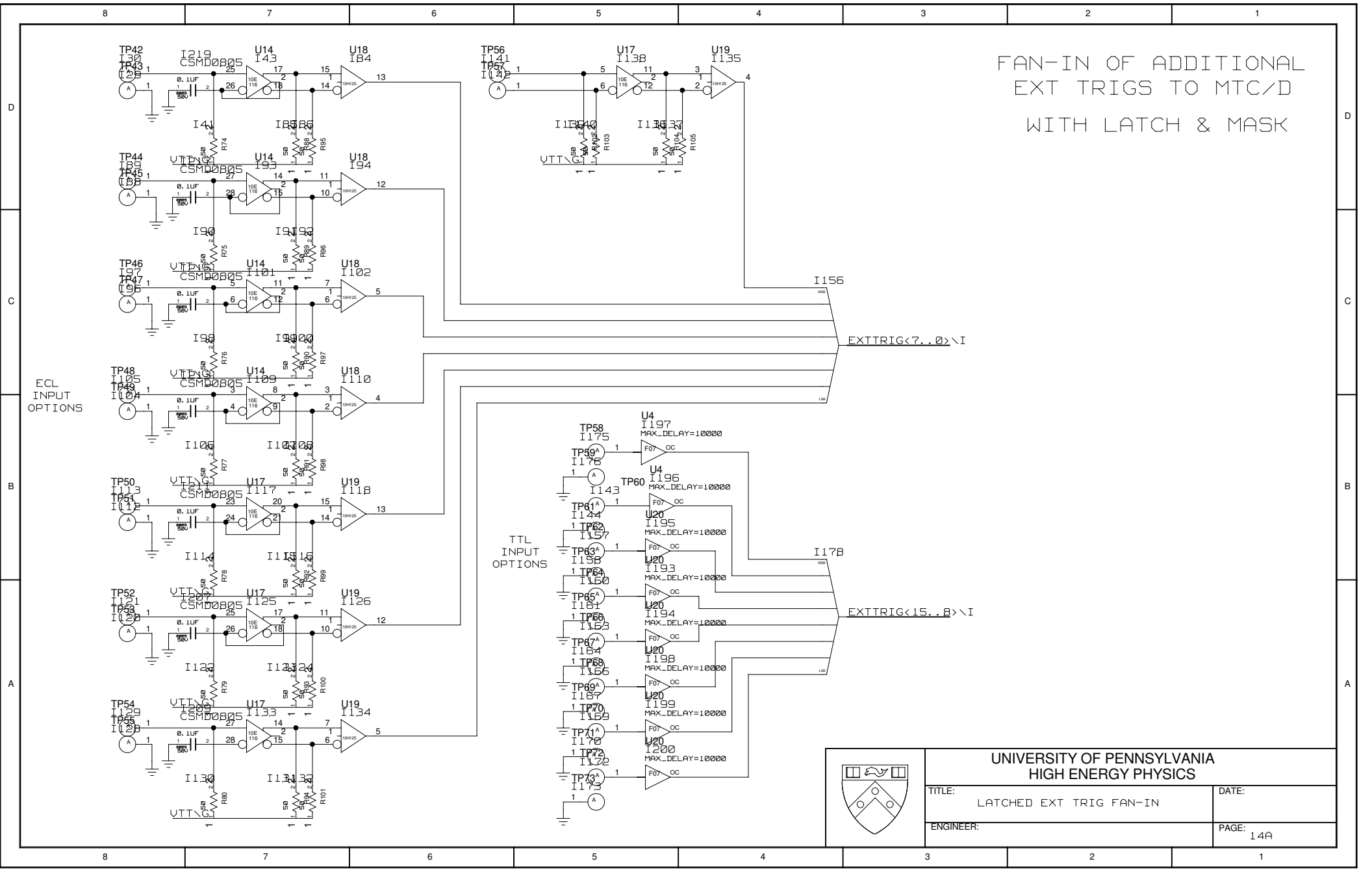
FAN-IN OF ADDITIONAL
EXT TRIGS TO MTC/D
WITH LATCH & MASK
ECL
INPUT
OPTIONS
TTL
INPUT
OPTIONS
EXTTRIG<7..0>\I
EXTTRIG<15..8>\I
I156
I178
TP42
TP43
TP44
TP45
TP46
TP47
TP48
TP49
TP50
TP51
TP52
TP53
TP54
TP55
TP56
TP57
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TP59
TP60
TP61
TP62
TP63
TP64
TP65
TP66
TP67
TP68
TP69
TP70
TP71
TP72
TP73
U14
U17
U18
U19
U4
U20
VTTVG
CSMD0805
0.1UF
50V
10E116
10H125
MAX_DELAY=10000
F07
OC
MSB
LSB
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LATCHED EXT TRIG FAN-IN
DATE:
ENGINEER:
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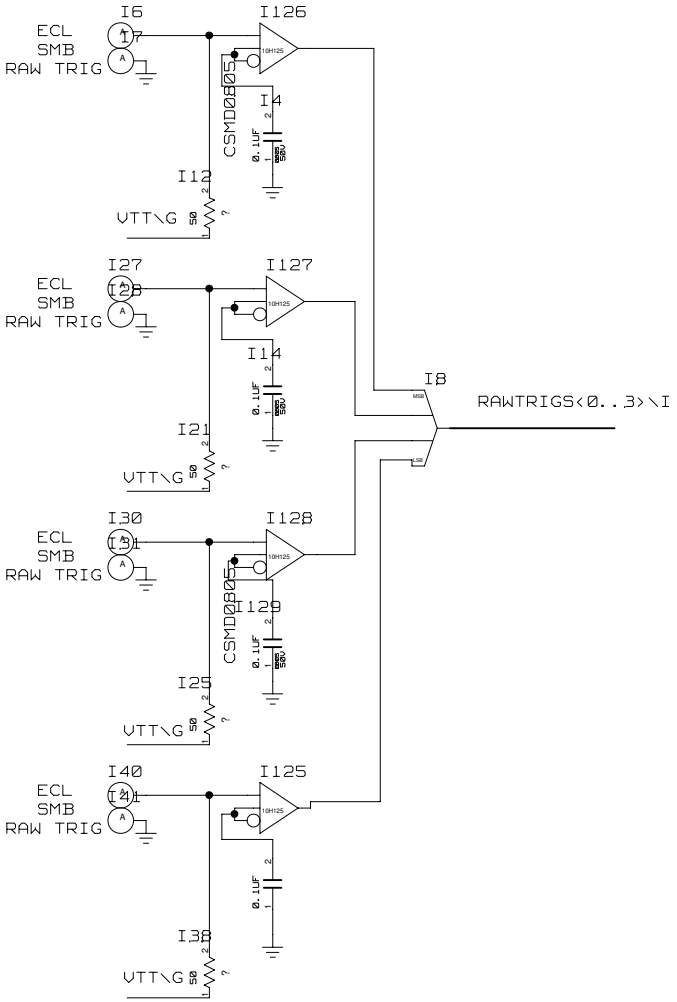
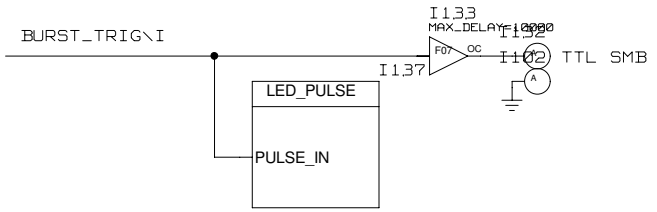
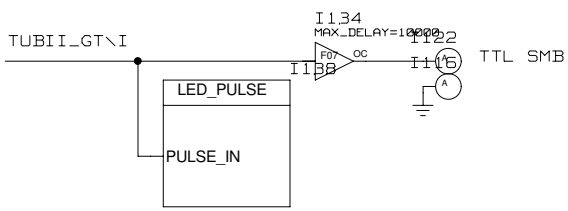
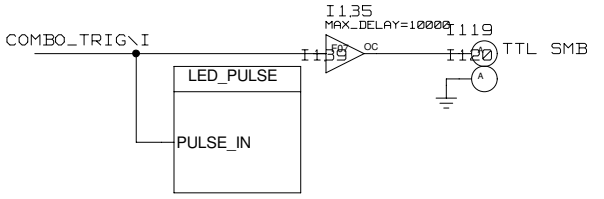
14A

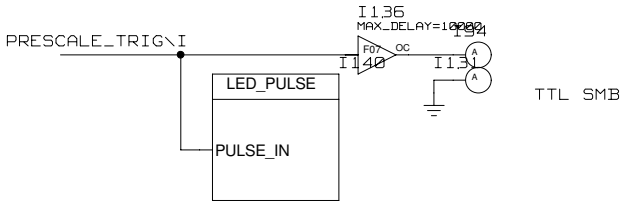
TUBII TRIGGERS
INPUTS AND OUTPUTS TO/FROM MICRO ZED











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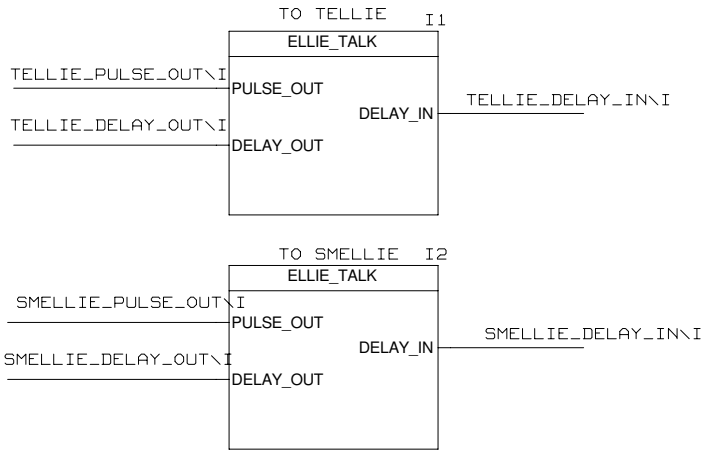
TITLE: TUBII TRIGGERS	DATE: 9/22/14
ENGINEER: ERIC M (ALSO GDOG)	PAGE: 14B

ELLIE

PORTS FOR COMMUNICATING WITH TELLIE/SMELLIE



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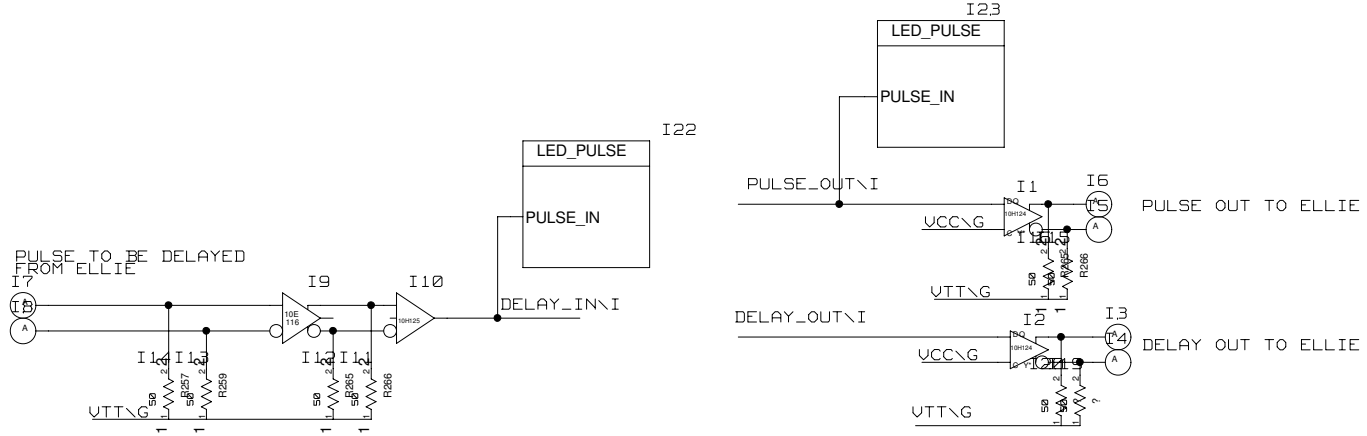
TITLE: ELLIE	DATE: 9/24/14
ENGINEER: ERIC M	PAGE: 14C

ELLIE TALK

COMMUNICATIONS TO/FROM ELLIE



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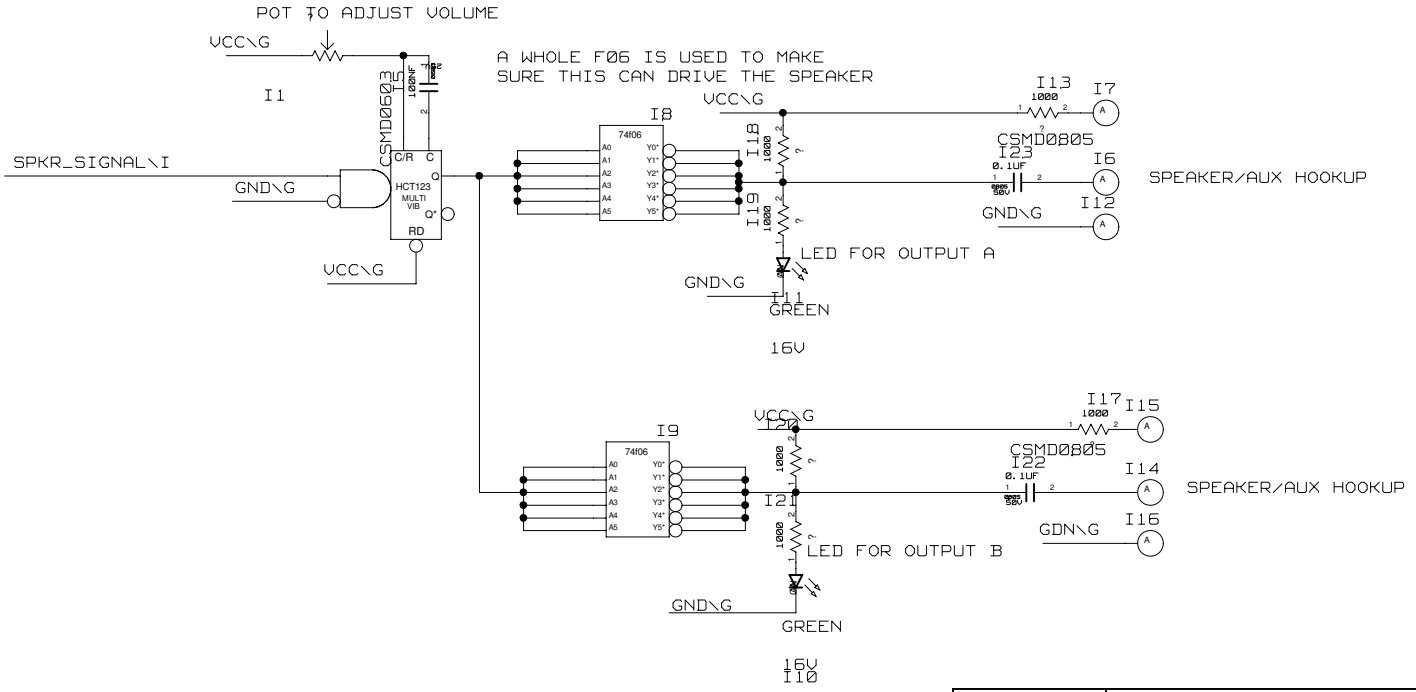
TITLE: ELLIE TALK	DATE: 9/19/14
ENGINEER: ERIC M	PAGE: 14D

TUBII SPEAKER



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TITLE: TUBII_SPKR	DATE: 10/2/14
ENGINEER: ERIC M	PAGE: 15