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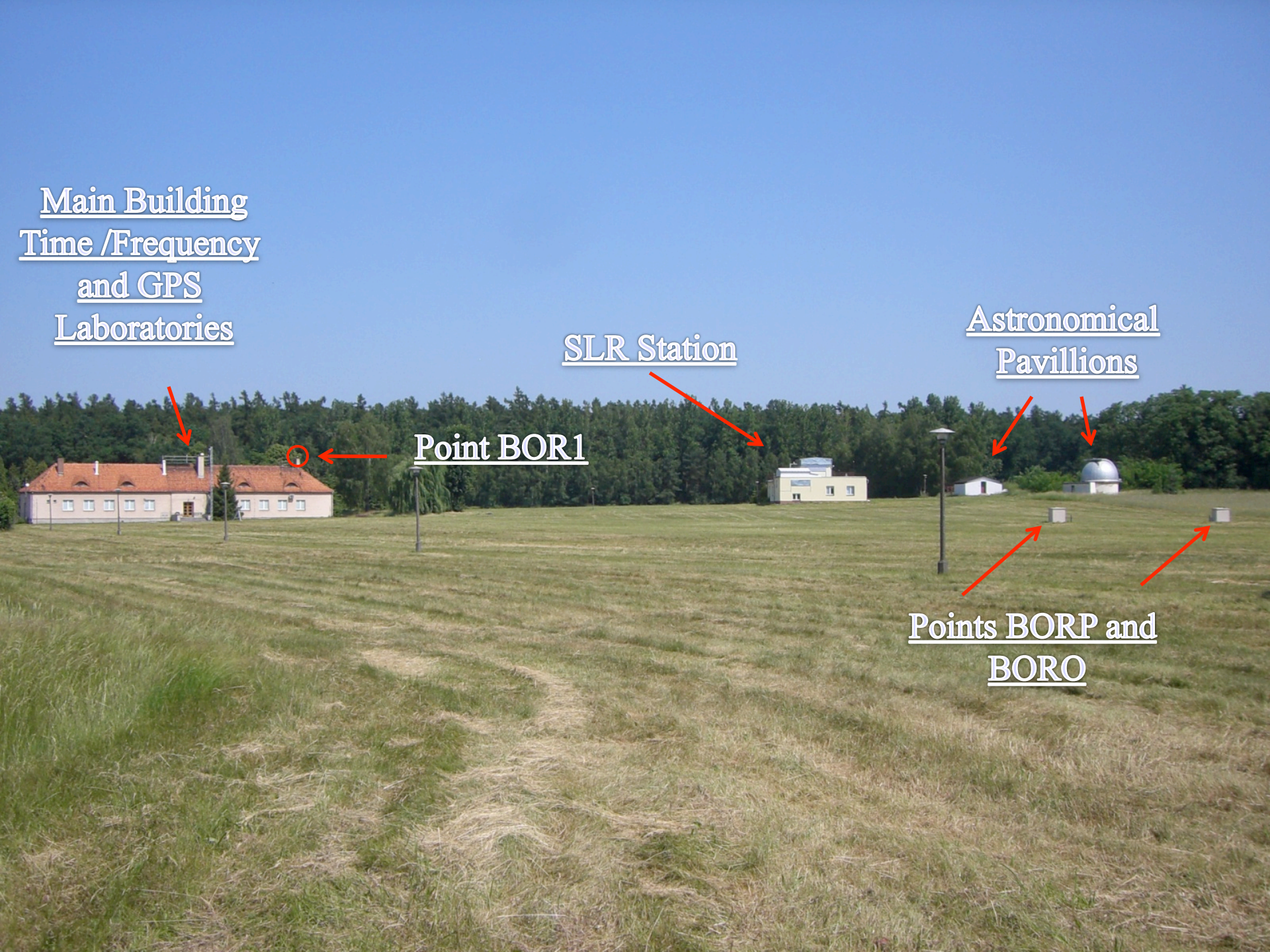
Upgrading of the Borowiec SLR station

S. Schillak, J. Bartoszak, P. Michałek

e-mail: sch@cbk.poznan.pl

Space Research Centre, Polish Academy of Sciences
Astrogeodynamic Observatory
Borowiec


Main Building
Time /Frequency
and GPS
Laboratories
Point BOR1
SLR Station
Astronomical
Pavillions
Points BORP and
BORO

Main goals

Better efficiency
Improvement of the single shot precision and accuracy of the satellite passes
Observations of the high satellites
Participation in T2L2

Modernization of the optical parts of the telescope:

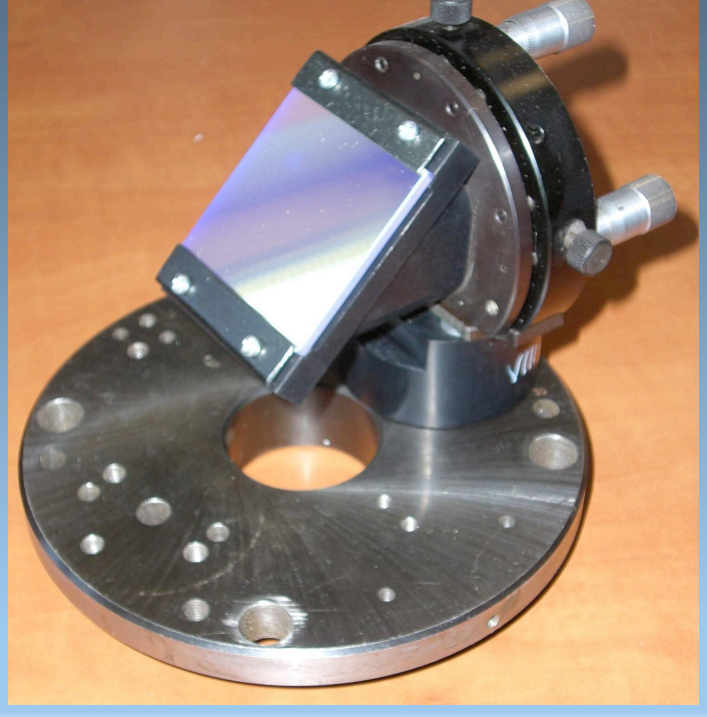
New cover of the main and secondary mirrors

Installation of the new dielectric mirrors in Coude path

Tests of two transmitting telescopes 10 cm and 20 cm

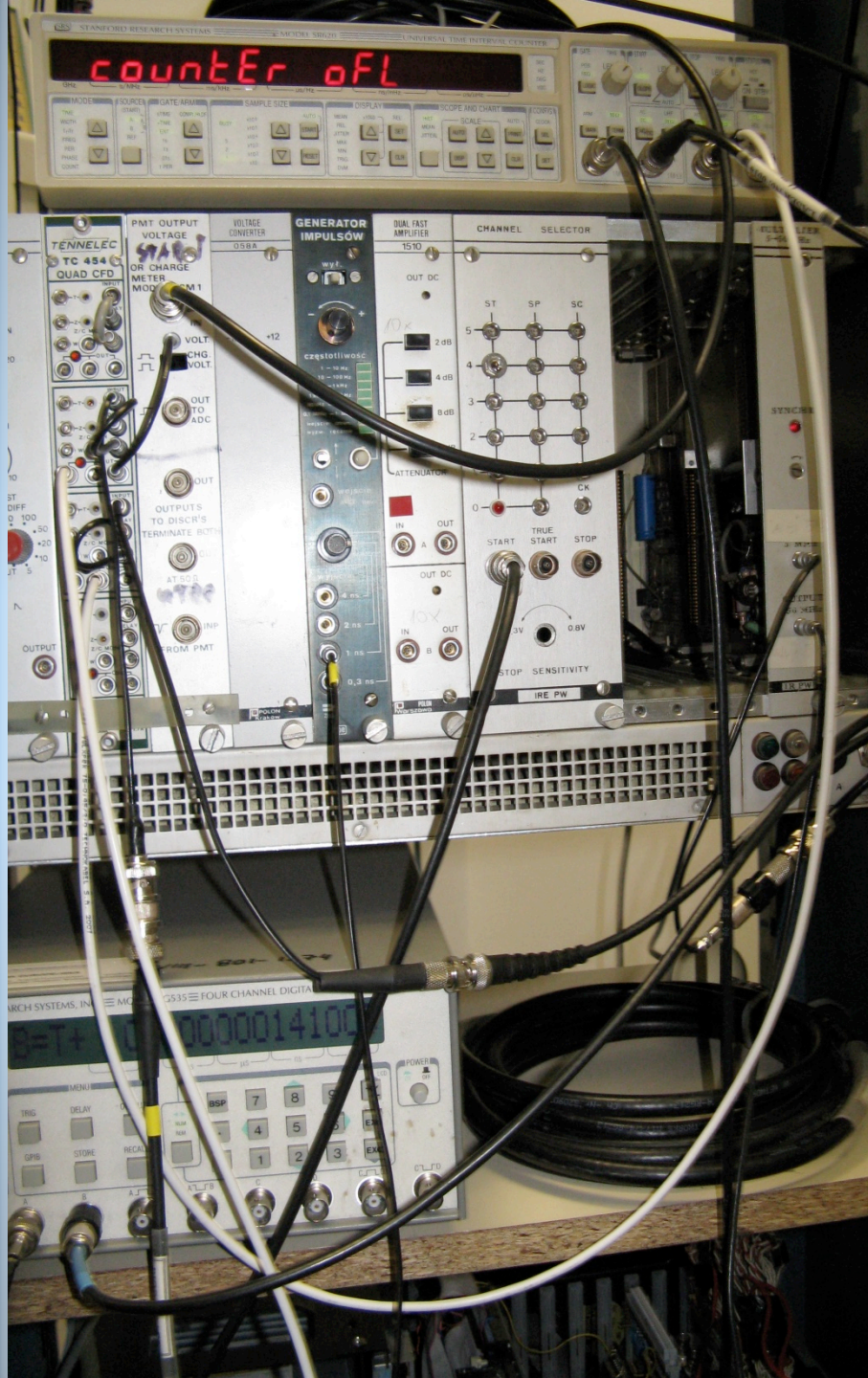
New optical elements in receiving part (interference filter, neutral filters, collimation lenses, dielectric mirror, spatial filter)

Installation of the sensitive CCD camera for control of the laser beam position, satellites and stars by the main mirror




GATE PULSE GENERATOR
DC/DC CONVERTERS & CHARGING UNIT
POWER
BATTERY CHARGING

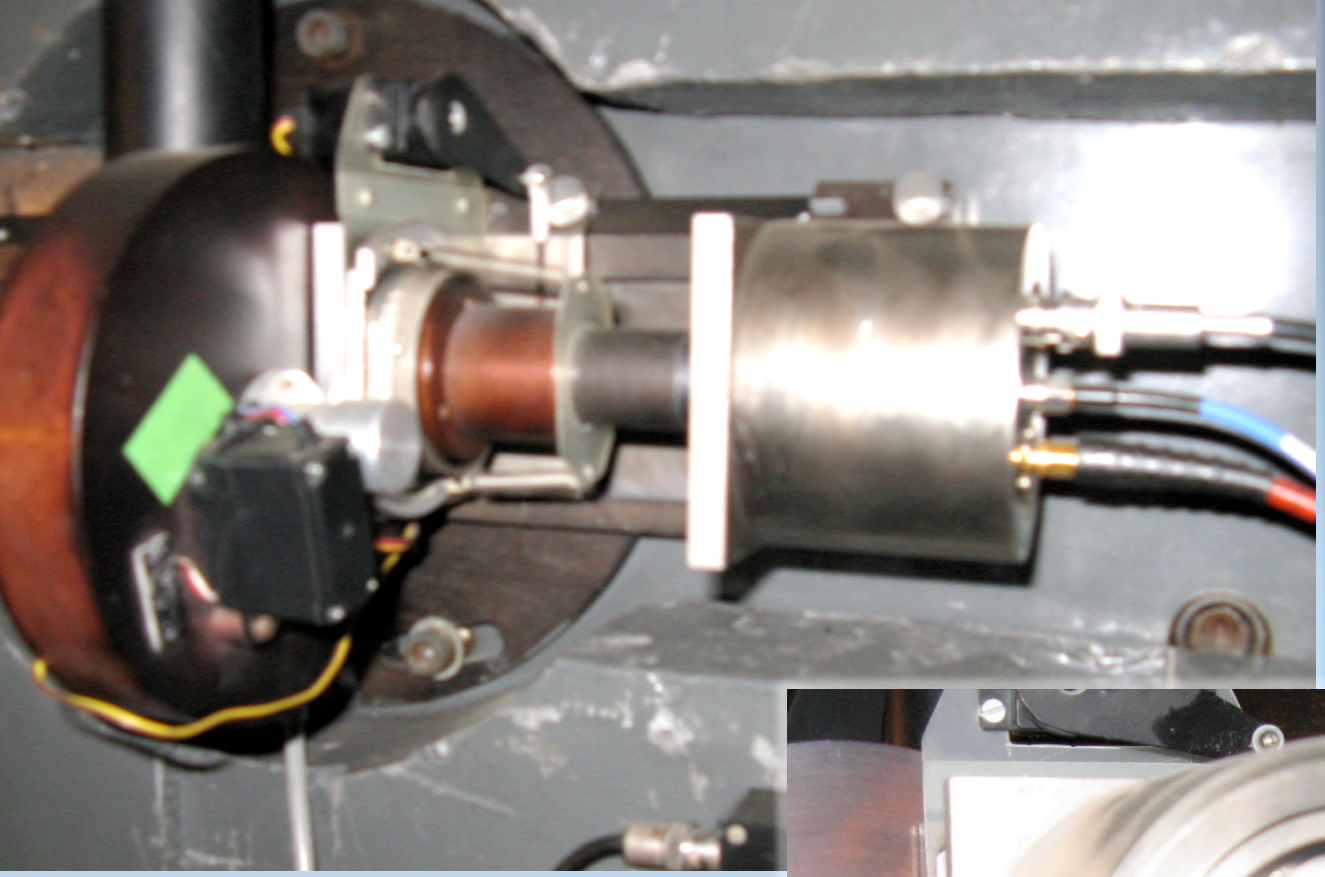

STANFORD RESEARCH SYSTEMS, INC.
Delay Range Error
TRIGGER
MENU
POWER

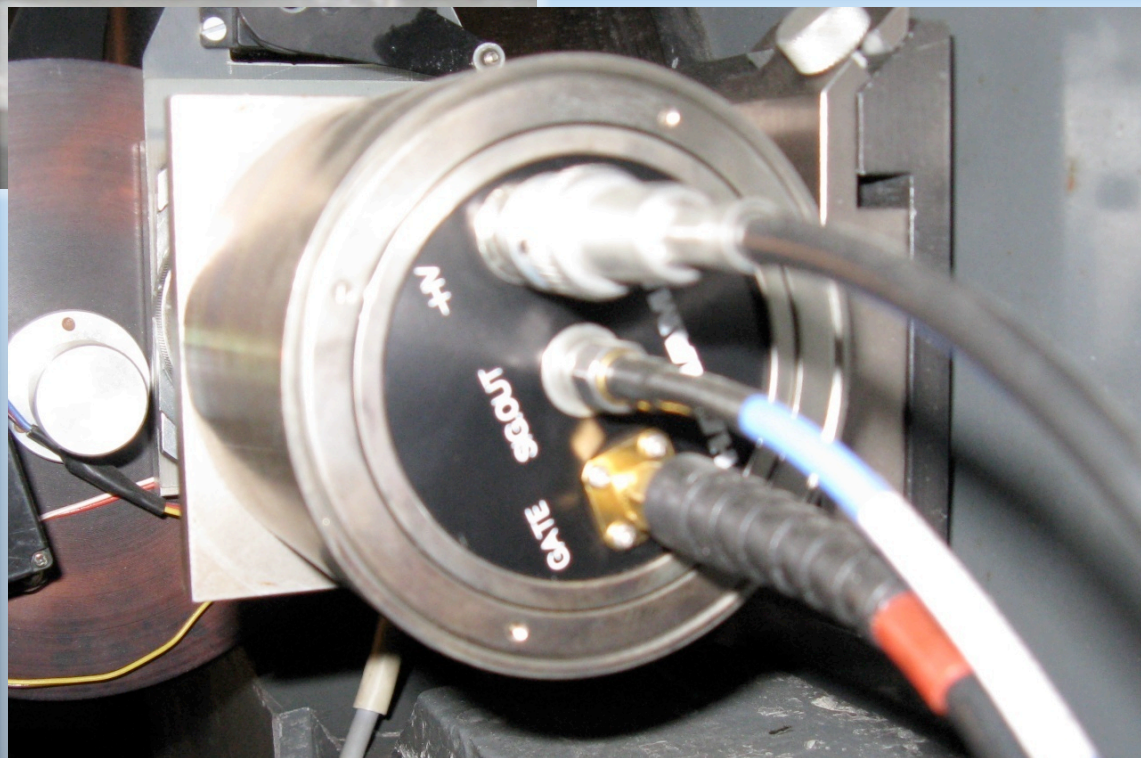

counter oFL
TENNELEC
TC 454
QUAD CFD
GENERATOR IMPULSÓW
CHANNEL SELECTOR
FOUR CHANNEL DIGITAL

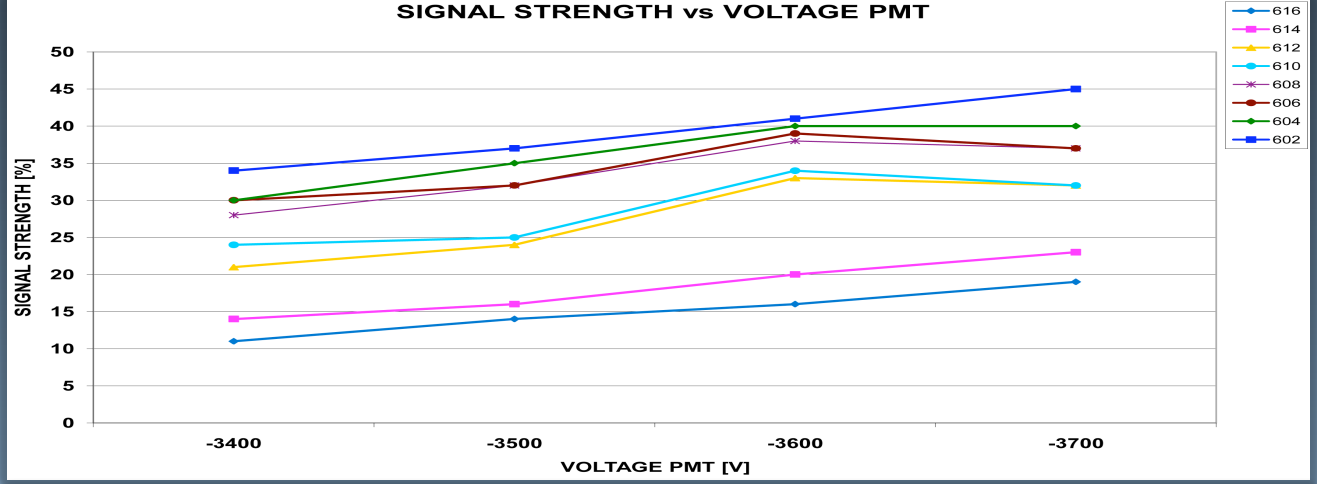
MCP PMT

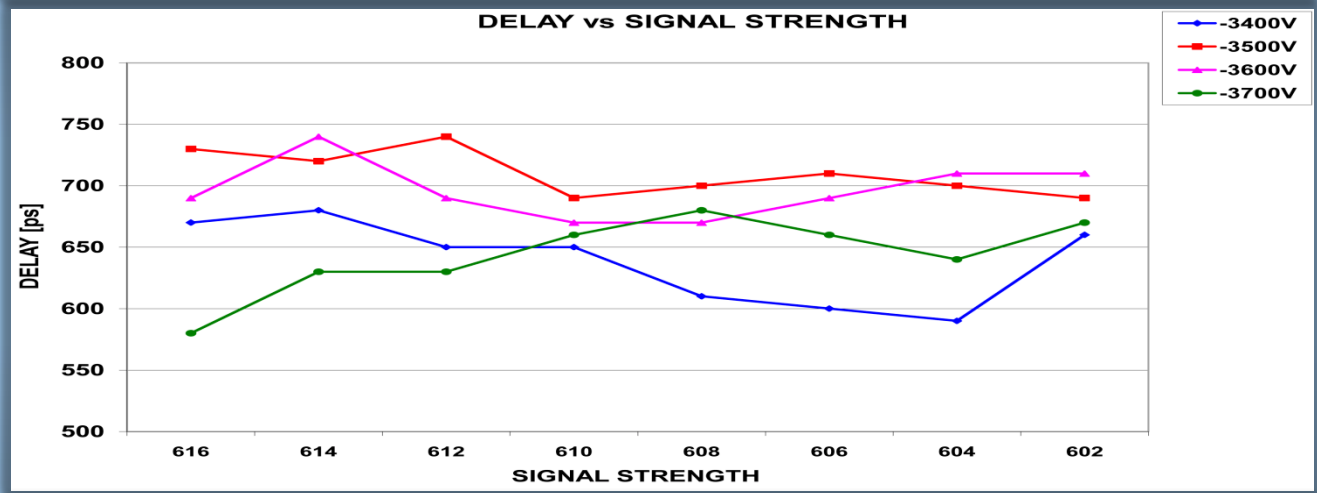
HAMAMATSU R5916U – 64 – 3MCP

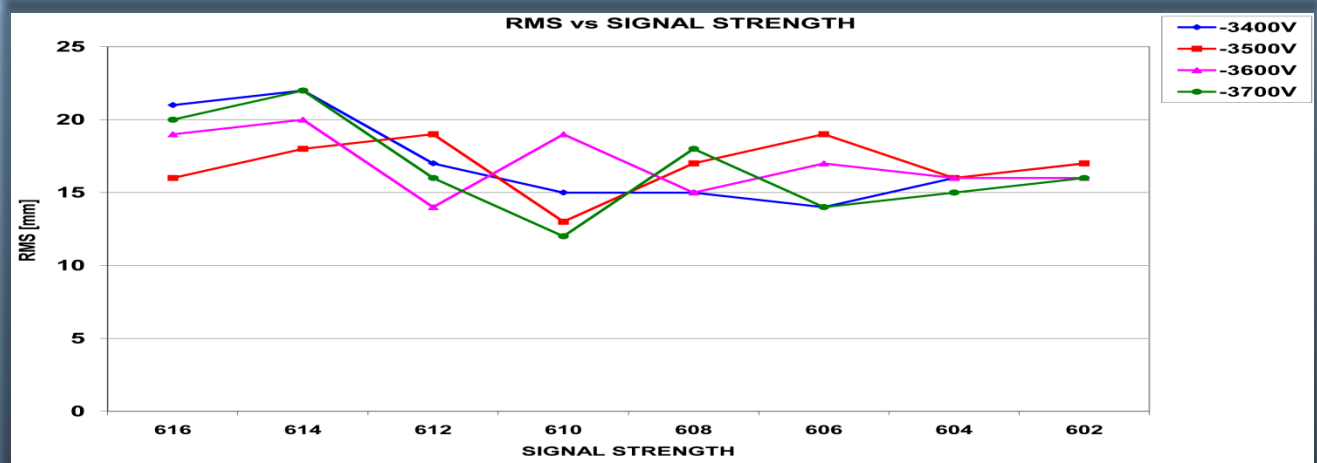
Average Current Gain at -3600V:	1.5×10^6
Average Dark Current:	0.33 nA
Quantum Efficiency at 532 nm:	30%
Rise Time:	182 ps
Transit Time Spread:	110 ps
Gate Rise Time:	687 ps
Max. voltage supply:	-4200V
Ambient Temperature in Operation:	-50 +50 ^{o}C




GATE
SHOUT


SIGNAL STRENGTH vs VOLTAGE PMT
SIGNAL STRENGTH [%]
50
45
40
35
30
25
20
15
10
5
0
-3400
-3500
-3600
-3700
VOLTAGE PMT [V]
616
614
612
610
608
606
604
602


DELAY vs SIGNAL STRENGTH
DELAY [ps]
800
750
700
650
600
550
500
616
614
612
610
608
606
604
602
SIGNAL STRENGTH
-3400V
-3500V
-3600V
-3700V


RMS vs SIGNAL STRENGTH
RMS [mm]
25
20
15
10
5
0
616
614
612
610
608
606
604
602
SIGNAL STRENGTH
-3400V
-3500V
-3600V
-3700V

NEAR FUTURE

Tests two transmitting telescopes – high satellites

Discriminator level for stop signal

Indoor calibration

Installation event timer

Software CRD

Participation in T2L2 – calibrations delay lines

kHz laser?