XDL DETECTOR FUNCTIONAL PROCEDURE

UCB/SSL THERMAL VAC

IMAGE-FUV-SI

Document # 8304-W6 Rev. C

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Approved: _____

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Revision History:

4/6/98	A	initial release
5/4/98	B	Misc. updates of procedure. Convert to MSWord doc.
5/30/98	C	Misc. minor changes for new T/V following detector rework

1.0 Scope:

1.1. This document is intended to provide procedures and log sheet for operating the IMAGE-FUV XDL detectors in the RM 20 Thermal Vac Chamber at SSL/UCB.

1.2 _____	This means log data here.
(xxxxx)_____	Nominal value xxxxx is included for ref.
x.x___Blah blah blah	Check __√__when done

1.3 Procedure is identical for 1218 and 1356 detectors; both detectors have nearly identical microchannel plate and electronic responses. Differences between detectors are indicated.

Detector I.D._____ Nominal Test Temp._____Date_____

BEGIN FUNCTIONAL

Operator_____

Data directory_____

2.0 EGSE Power Up (no HV turn on):

2.1___ The Sun Workstation is to be left on at all times. Set up the data acquisition program and IDL session in the directory of interest.

2.2 While both detectors may be running (high voltage on) only one detector is to be (and can be) tested at a time.

2.3___Switch on the HP power supply for the amplifier and -17V for the HVPS's. This one supply will power both detectors.

2.4___ Switch on the 2 Power Designs power supplies that supply +/- 12V for the HVPS's.

2.5___ Switch on the oscilloscope and NIM electronics. Set the counter gate to 1 second.

2.6___ Hook up the amplifier (of the detector to be tested) outputs into the CFD. Follow the same standardized hookup convention as all previous testing for the flight detectors, in sect. 2.7.

2.7___ Ensure that the DAQ electronics settings are nominal. Record any changes.

CFD:	CH. A (top) J22 (YBegin)	LT: -35mV (-350mV at test pt.)
	CH. B J23 (YEnd)	LT: -35mV
	CH. C J20 (XBegin)	LT: -35mV
	CH. D (Bottom) J21 (XEnd)	LT: -35mV

Do not adjust the walk; it has been set to acceptable levels per earlier tests.

Delay box: Y 20nS (top)
X 20nS (bot.)

TAC: X- LHS, Y-RHS Range: Both 100 nS, Mult. = 1.00 (10.00 on dial)
___ Change Mult. to 1.00 for both X and Y (may have been set to 1.10 for prev. flat field)

ADC: OMNIBOX #2 CH. A - Gnd. Plug CH. B - X CH. C - Y
DAQ: DIB box #2 Input #1 - B(X) Input #2 - C(Y) Input #3 - A(N/U)

Changes:_____

_____

2.9___ Log temperature, pressure, and TQCM readings on log sheet. Record begin of functional.

3.0 Detector HV turn on:

3.1___ Ensure chamber pressure is in safe operating range, P < 1 x 10^{-5} Torr.

3.2 Operating Voltage: Conversion for HVc (=HVmon) is approx. **HV = HVc*1300**.
Operating Current: Conversion for Imon is approx. **I** (uA) **= Imon*20**

+25C: Nominal voltages are **HVc =3.50V** (HV=4500v) for both detectors.

+40C: At warmer temperatures MCP gain may be lower and the operating voltage may need to be slightly higher to operate at same gain (i.e., to get same amplitude on amplfier outputs). Operate detector with caution as MCP resistance is lower.

-30C: At colder temperatures MCP gain may be higher and the operating voltage may need to be lower to operate at same gain. Operate detector with caution as MCP resistance may be significantly higher, resulting in a higher MCP voltage for the same HVc.

___ Turn on photons and slowly turn up HV (the lower knob on the Power Designs unit) on the detector of interest until desired voltage is reached. Monitor counter and amplifier outputs while approaching desired voltage.

3.3 Record operating parameters:

HVmon (3.50V)_____

Imon: (2.50V)_____(note: varies with temp.)

UV rate: (10-15Kcps) _____cps

Background rate: _____cps (clean room lights off)

XE amplitude: (750mV)_____mV (hint: use “averaging” feature of o’scope)

YE amplitude: (125mV)_____mV

3.4 Notes:

_____

_____

_____

4.0 Acquiring data:

4.1 Summary of images to acquire and filename conventions (example for HVc=3.50V):

3.50HVc.stim	Stim images	"xyp" photon list mode	5Kcnts
3.50HVc.bkg	Background images	"xyp" photon list mode	1Kcnts
3.50HVc.phot	Photons	"xyp" photon list mode	20Kcnts
3.50HVc.ff	Photons, flat field	"image" mode	15Mcnts
3.50HVc.xxx.n	nth repetition of acquired image		

4.2 Set DAQ program to "xyp input" mode.

Acquire background image for 1Kcnts for background rates 10cps or less. Increase number of counts acquired proportionately with count rate (e.g. 4 Kcnts for 40 cps.).

Filename: (3.50HVc.bkg)_____count rate:_____cps

Hot spot activity: (record location and count rate) ___None (bkg. diffuse)

_____

4.3___ Turn on pulser that triggers stim generator. Keep detector HV on.

___Use nominal CFD threshholding (sect. 2.7), or

___Change to custom settings to ensure no discrimination of counts and proper imaging.
Custom: YB lt:_____YE lt:_____XB lt:_____XE lt:_____

Acquire 5K data set. Measure spot sizes in FWHM bins and positions in bin coords.

Filename: (3.50HVc.stim)_____

Xfwhm:_____microns XPos:_____

Yfwhm:_____microns YPos:_____

Scale factors: 1218X - 1.35 um/bin 1218Y - 1.40 um/bin
1356X - 1.30 um/bin 1356Y - 1.15 um/bin

___Store all 4 amplifier output signals onto disk from digital oscilloscope.

4.4 ___Turn on UV lamp. Turn off pulser.

___Use nominal CFD threshholding (sect. 2.7), or

___Change to custom settings to ensure no discrimination of counts and proper imaging:
Custom: YB lt:_____ YE lt:_____ XB lt:_____ XE lt:_____

Acquire 20K photon image.

Filename: (3.50HVc.phot)_____ Count rate:_____cps

___Store all 4 amplifier output signals onto disk from oscilloscope.

4.5 Change DAQ program to “image” output mode. Acquire flat field for 15000Kcnts.

1218: zoom=2 (n=1), xoff=250, yoff=270, TAC mult =1.00 both X and Y (no change)
1356: zoom=2 (n=1), xoff=250, yoff=200, TAC mult=1.00 X, 1.10 Y (change)

Filename:(3.50HVc.ff)_____Count rate:_____cps

___Change TAC mult. back to 1.00 for Y.

4.6___ Log temperatures, etc. Note end of functional on log sheet.

4.7 Notes: