Direct Drive Experiments on the OMEGA Laser at the Laboratory for Laser Energetics of the University of Rochester



SEM of Gold Foam Surface

Pre-Shot Report Direct Drive Cylinder Mix (DDCYLMIX) 00-1 and Backlighter Studies January 17-21, 2000





TABLE OF CONTENTS

OVERVIEW	
DIAGNOSTIC LIST FOR WEEK	4
CYLMIX EXPERIMENT	5
GOALS OF THE EXPERIMENT:	
MIX TARGET CALCULATIONS	6
Experimental Template	7
LASER BEAM POINTING BY BEAM GROUPS	
TARGETS	
Standard Target Drawing and Photo	
Pinhole Apertured Point Backlighter (PAPBL) Tests	
Target Table for DDCYL targets	
SHOT SCHEDULES	
SHOT SCHEDULE: Tuesday, January 18, 2000	
SHOT SCHEDULE: Wednesday, January 19, 2000	
DIAGNOSTICS	
DIAGNOSTIC SETTINGS, Tuesday:	
Diagnostic Timing Diagrams, Tuesday	
DIAGNOSTIC SETTINGS, Wednesday	
Diagnostic Timing Diagrams, Wednesday	
TIM Setup Sheets	
BACKLIGHTER STUDIES	
EXPERIMENTAL PROPOSAL TEMPLATE	
TARGETS	
CONFIGURATION FOR LAPC	
CONFIGURATION FOR HENWAY SPECTROMETER	
Transmissions for the various filters	
SUMMARY OF SHOT SCHEDULE AND DIAGNOSTICS	
TIM SETUP SHEETS	
Film to be used at OMEGA 1-18/19-00	
Film to be used at OMEGA 1-20-00	
CONTACT LIST OF KEY PERSONNEL	

This document is intended to give an overview of this experimental campaign. Where information conflicts with experimental configurations submitted by official methods, those configurations take precedence. Contact the Principal Investigators prior to making any changes in the configuration to accommodate conflicts of information based on this document.

This document was produced by the Los Alamos National Laboratory under the auspices of the United States Department of Energy under contract No. W-7405-ENG-36.

OVERVIEW

LANL Experimental Week on OMEGA January 17-21, 2000 (DDCYLMIX 00-1 and Backlighters)

Super PI: Cris Barnes (505)665-5687, <u>cbarnes@lanl.gov</u>

Tuesday&Wednesday, January 18-19, 2000: DDCYL Mix PI: Steve Batha, (505)665-5898, <u>sbatha@lanl.gov</u> PD: (Mike Dunne, AWE, 011-44-1189-824258, <u>mdunne@awe.co.uk</u>)

Thursday, January 20, 2000: Backlighters PI: Jonathan Workman, (505)665-1784, <u>workman@lanl.gov</u>

OMEGA will be configured for direct drive (distributed phase plates, LLE blast shields) and the beams pointed for the direct drive cylinder experiments. In addition to the usual 55 beams setup for DDCYLs, the 5 beams around Pent 6 will have their DPPs removed and pointed for use as point backlighters.

At the end of Wednesday, overnight 12 beams around Hex 7 will be repointed and retimed and have their DPPs removed. Four TIM-based diagnostics will have to be setup: the XRFC4 in TIM4 at 12X re-aligned, a streak camera and XRFC2 already aligned both installed, and a low (or no) mag pinhole camera (LAPC) with film-pack.

Diagnostic List for Week

			Campaign Segment	
			DDCYL (Point	
T	М	DDCYL Mix	Backlighter)	Backlighter
1	(Pent 3)			XRFC2 @ 6X
2	(Hex 7)	LXS (CI)	LXS (CI)	LAPC @ 2X
3	(Hex 18)	XRFC3 @ 6X	XRFC3 @ 6X	1
4	(Pent 6)	XRFC4 @ 12X	XRFC4 @ 12X	
5	(Hex 14)			XRFC4 @ 12X and 6X
6	(Pent 7)	LAPC @ 2X, QXI @ 8X	QXI	SSCA (Fe & Ge)
P	ent 2b	Henway	Henway	Henway
		Pinhole Cameras	Pinhole Cameras	Pinhole Cameras
		P510s	P510s	P510s
		"FFLEX"	"FFLEX"	"FFLEX"
		Backscatter Calorimetry	Backscatter Calorimetry	
		Prepulse monitors	Prepulse monitors	-
		IXRSC	IXRSC	

CYLMIX Experiment

January 18 & 19, 2000

Experimental Team: Steve Batha (P-24), Cris Barnes (P-24), Steve Rothman (AWE) Design Team: Mike Dunne (AWE), Graham Dillon (AWE)

Goals of the experiment:

Primary:

- Radiograph small diameter static targets for image analysis evaluation
- Observe Richtmeyer-Meshkov induced mix in a compressible material in a convergent geometry

Secondary:

- Initiate LANL program in pinhole-apertured point backlighters (PAPBL)
- Spectroscopy of chlorine-doped foams and marker layers

Bibliography

U 1 I	
LA-UR-99-2180	LANL Campaign DD-99-1, May 1999 preshot report
LA-UR-99-6446	LANL Campaign DD-99-1, May 1999 postshot report
LA-UR-99-6286	"AWE Experiments on Laser-Driven Mix in Planar and
	Convergent Geometry"
P-24-2000-009	"Final Target Request for Direct Drive Cylindrical Mix
	Experiment on OMEGA the week of January 17, 2000"

Mix Target Calculations



Experimental Template

• Experiment title, principal investigator's name, and, if related to LLE direct-drive experimental program, which category (i.e., ISE, RTI, etc.) the experiment falls under, and planned shot dates.

Title:CYLMIX: Richtmyer-Meshkov Induced MixPI:Steve BathaDate:January 18 & 19, 2000

• Summary of the experiment's objectives.

Primary Objectives:

1. Radiograph small diameter static targets for image analysis evaluation

2. Observe Richtmyer-Meshkov induced mix in a compressible material in a convergent geometry.

Secondary Objective:

3. Initiate LANL program in pinhole-apertured point backlighter (PAPBL) technology.

- Laser conditions required for the experiment:
 - Pulse shape SG1011 (1 ns square) and RM2001 (2.5 ns ramp)
 - SSD, DPP, and DPR conditions
 - *Remove DPPs from 5 beams around P6 (10, 15, 28, 31, 37)*
 - All other DPPs in
 - DPR in beam 50 remains in
 - *Maximum SSD available (1.5Å x 3Å).* Use no SSD on PAPBL targets with focussed backlighter beams.
 - Power/energy balance Nominal 450 J/beam, reasonable effort on beam balance
 - Number of beamlines and target pointing summary requirements
 - 50 beamlines in cylindrical illumination geometry timed at t₀
 - 5 beams (42, 44, 53, 57, 62) pointed 1.625 mm towards $P7(\theta = 116.6^{\circ}, \phi = 162.0^{\circ})$
 - 5 beams (10, 15, 28, 31, 37) pointed 16.4 mm towards P6 (θ=63.44°, φ=342°), with three beams (10, 28, 31)up 0.5 mm (θ=61.70°) and two beams (15, 37) down 0.5 mm (θ=65.20°).
 - Backlighting requirements and beam timing delays
 - 2 sets of backlighter beams with different delays on each day
 - January 18: BL set 1 (42, 44, 53, 57, 62) delayed 4.0 ns
 - January 18: BL set 2 (10, 15, 28, 31, 37) delayed 4.0 ns
 - January 19: BL set 1 (42, 44, 53, 57, 62) delayed 2.0 ns
 - January 19: BL set 2 (10, 15, 28, 31, 37) delayed 4.0 ns
 - Special laser conditions *None*.

1) Diagnostics required and target chamber port assignments (indicate any non-LLE-provided diagnostics).

LANL will supply the QXI and LAPC diagnostics. Other Diagnostics requested:

- The IXRSC in port H3F is a primary diagnostic on all shots with drive beams on. Minimal filtration required, starting at 0 ns.
- Static PHCs are required with minimal filtration.
- SBS backscatter calorimeters on both beamlines.
- P510 pulse shape measurements on all shots.

TIM	PORT	Diagnostic	Priority/Purpose
1	P3		
2	H7	LSX	2/Cl lines
3	H18	XRFC3	2/Transverse view
4	P6	XRFC4	1/Primary end-on view
5	H14		
6	P7	QXI (2x, 8x, no snout), LAPC	QXI primary for PAPBL shots. LAPC priority 2.
		IXRSC	1/implosion trajectory
		Henway	2/backlighter spectra

2) Type and number of targets including number of spares (this section must be completed even if using non-LLE-provided targets). NOTE: if special targets are required, they must be specified more than two months in advance. Additionally, special target geometries may require metrology prior to delivery to LLE and verification after arrival at LLE using LLE's Powel scope.

Two pointing targets will be required from LLE target fabrication.

All other targets will be constructed by LANL. Twenty (20) new cylinder targets have been requested. In addition, up to 6 "old" targets will be remounted. Cylinder targets consist of three pieces: a cylinder approximately 1 mm OD and 2 mm long, a 2 mm OD backlighter disk cantilevered off one end, and a view-blocking aperture cantilevered from the opposite end.

Since these targets have not been used with the H2 target positioner, a test target was delivered to LLE for alignment tests. These tests have been completed satisfactorily.

3) Number of required laser shots.

20 laser shots will be required. This experiment has been allotted 2 full days minus any facility time needed to prepare for the backlighter experiments on January 20.

VII. Special shot schedule considerations associated with experiment.

Diagnostics will not change port locations during these two days of shots. However, TIM 6 will be a very active location. The QXI will need to be timed at several different magnifications, including without a snout. QXI is the primary diagnostic for the pinhole-apertured point backlighter (PAPBL) shots.

When the PAPBL targets are shot, they face the opposite direction from the rest of the targets. That is, the backlighter is on the P6 end of the target rather than on the P7 end. Different backlighter beams will be used for those shots as well.

Also, the LAPC (Los Alamos Pinhole Camera) will replace the QXI for a few shots

1/18/00

Laser Beam Pointing by beam groups

Beam Pointing by beam groups									
CYLMIX Experiments: January 18 & 19, 2000									
Group #	Beams	Focus	Direct ion	R (mm)	Theta (deg)	Phi (deg)	Delay (ns)		
2	40,45,47,51,69	0.0	P6	0.720	63.4	342.0	0.0		
2'	16,17,20,33,35	0.0	P7	0.720	116.6	162.0	0.0		
3	11,21,22,26,27,32,34,36,39,46	0.0	P6	0.108	63.4	342.0	0.0		
3'	25,50,54,58,59,60,63,64,65,67	0.0	P7	0.108	116.6	162.0	0.0		
4	12,13,23,24,29,38,41,48,56,61	0.0	P6	0.108	63.4	342.0	0.0		
4'	14,18,19,30,43,49,52,55,66,68	0.0	P7	0.108	116.6	162.0	0.0		
BL1	42,44,53,57,62	0.0	P7	1.625	116.6	162.0	4.0 (Tues)		
		0.0	P7	1.625	116.6	162.0	2.0 (Weds)		
BL2	15,37	400 μm spot	P6	16.408	65.2	342.0	4.0		
BL2'	10,28,31	400 μm spot	P6	16.408	61.7	342.0	4.0		

Page 10

Standard CYLMIX (high-mix) target showing backlighter at upper left, marker/mix layer band in center, and leaded-acrylic aperture at lower right end. The mounting stalk going to the H2 TPS2 is attached to the aperture. The XYZ alignment fiber is on the aperture near the bottom in back.

Pinhole Apertured Point Backlighter (PAPBL) Tests

During the DDCYL00-1 campaign in January 18-20, 2000 we are planning a test of x-ray imaging using LLNL-designed Pinhole-Apertured Point BackLighter (PAPBL) arrays. To detect these x-rays we will use the QXI two-strip module; each strip will fire at some time during the emission from the appropriate PAPBL to create a single image. The shots will image a direct-drive cylinder undergoing implosion.

The cylinder image is up to 1014 microns in diameter; however the key physics region that we can backlight through is approximately 800 microns in diameter. I want to keep the parallax from the two point sources relative to the cylinder axis to less than 2 degrees. The QXI strips are a bit over "double-wide" and are 15 mm across. There is a 2.78-mm gap between the strips. The five beams around Pent6 on OMEGA (beams 10, 15, 28, 31, and 37) can only be focussed a distance approximately 17.9 mm from TCC, and this number varies up to a millimeter and a half in time^{*}, which is a significant design constraint. I design to a 16.4-mm defocus distance which should be good over time. The distance F of the pinhole to TCC is going to be 16.4-1=15.4 mm assuming a 1.0-mm distance from backlighter foil to pinhole substrate. Since the height of the center of the image H needs to be above the centerline by $(0.8 \times M + 2.78)/2$, and the detector distance D must be greater than H/tan2°, and the magnification itself is (D+F)/F, then the magnification needs to be greater than $[2.78+2Ftan2^{\circ}]/(2Ftan2^{\circ}-0.8)=13.99$ for F=15.4. So we will operate actually at (200+15.4)/15.4=14X magnification with the detector 200 mm from TCC. In keeping with the preliminary design for a NIF point backlighter, I wanted to operate at a magnification M of about 12, so this works out well (but choosing a reduced image region closer to the centerline). The point backlighter array is then placed 15.4 mm on the other side. The image center will be H=(0.8*14+2.78)/2=6.99 mm above the centerline. Each pinhole should be 6990/14=499 microns from the center line, or 998 microns between them (call it a round 1000 microns).

At 20 cm from TCC the detector just barely violates the TIM diagnostic envelope. We will be using TIM6 in Pent 7; by "turning the cylinder around" and mounting the backlighter in the opposite direction we don't affect the XRFC4 in TIM4, and we can have the otherwise unused beams pointed at this 1.64 cm away location for the point backlighter. In either case the 5 laser beams around the pent port of the diagnostic are not fired and hence do not affect the envelope. According to the review no other diagnostics will conflict with this setup.

^{*} Phone conversations with Keith Thorp, November, 1999.

Violation of TIM-diagnostic envelope for detector at 15 cm (5.9"). Diagnostic space envelope defined by 16° solid angle set back 1.6". There is no interference when defined at TCC. At 20 cm things are even less problematic.

Now I calculate the size of the leaded-acrylic aperture needed. It will be located at the far end of the cylinder from the backlighter, on the side towards QXI as usual.[#] Thus it will be 15.4+1.125=16.525 mm from the backlighter. The top of the QXI strip is 15+2.78/2=16.39 mm from the centerline, or 16.39-0.499=15.89 mm above the offset position of the PAPBL, and is 200+15.4=215.4 mm from the PAPBL. Thus the aperture shield needs to block a ray that is

0.499 + (16.525/215.4)*15.89 = 1.72 mm

above the centerline. Thus we need a leaded-acrylic aperture that, instead of the usual 1500 micron diameter, is actually 3440 microns in .

Addition by SHB (12/3/99): The inner diameter of the aperture must be small enough to block light from the wrong pinhole hitting the bottom of the strip, but must be large enough so that it does not obscure the desired image. The minimum ID of the washer is:

 $2*{[(16.525+0.2)/(16.525-1.125)]*[0.5+(0.8/2)]-0.5} = 0.955 \text{ mm},$

where I assume that the cylinder is 0.8 mm in diameter at the time of interest and the point of interest is the center of the cylinder, 1.125 mm from the aperture. The aperture is assumed to be 0.2 mm thick. The maximum ID of the aperture is:

 $2*{0.5+(16.525/215.4)*[(2.78/2)-0.5]} = 1.137 \text{ mm}$

[#] There was a major problem with this design. This oversized (compared to standard DDCYL targets) leadedacrylic aperture needs to be offset from the cylinder towards the camera, or it blocks drive beams. For the January 2000 shots we will have to turn off cone 2' beams from that side and possibly cone 3'.

Therefore, choose an inner diameter of 0.98 ± 0.01 mm and an outer diameter of 3.50 ± 0.01 mm.

The PAPBL alignment target showing, starting at the right, the leaded-acrylic washer, the high-mix cylinder, the alignment fiducial (at the top left corner of the cylinder), the mounting stalk (directed to the bottom of the figure), the rotation flag on the mounting stalk, and the backlighter boom extending off to the left.

The PAPBL alignment target showing, starting at the right, the backlighter boom, the square Ta foil that has the pinholes in it, the 1 mm spacer, and the Ti backlighter foil at the far left.

Target Table for DDCYL targets

DYNAMIC Targets:

Target	Target	descriptor	Perturbation	Tracer	foam fill	Flash	backlighter	aperture
	Name					Coating		
#1-2	DDCYL	73 µm CH	unperturbed	4 µm	60 mg/cc	Yes	6 μm Ti/1 mil Be	Pb-plastic washer
low mix	1 Gold	(1014 μ m		C8H6Cl2	СН		(cyl. side)	XRFC side
	1-2Yellow	OD)					Axial mount	
#3	DDCYL	73 µm CH	unperturbed	4 µm	60 mg/cc	Yes	6 μm Fe /1 mil Be	Pb-plastic washer
low mix	1 Gold	(1014 μ m		C8H6Cl2	СН		(cyl. side)	XRFC side
	3 Yellow	OD)					Axial mount	
#4-6	DDCYL	60 µm CH	unperturbed	1 μm Au	60 mg/cc	Yes	6 μm Ti/1 mil Be	Pb-plastic washer
high mix	2 Gold	(980 µm		over	СН		(cyl. Side)	XRFC side
	1-3Yellow	OD)		foam			Axial mount	
#7-9	DDCYL	60 µm CH	w/wire defect	1 μm Au	60 mg/cc	Yes	6 μm Ti/1 mil Be	Pb-plastic washer
high mix	3 Gold	(980 µm	unperturbed	over	СН		(cyl. Side)	XRFC side
defect	1-3Yellow	OD)		foam			Axial mount	
#10-12	DDCYL	60 µm CH	unperturbed	1 μm Au	60 mg/cc	Yes	PAPBL TBD	Pb-plastic washer
high mix	1 Blue	(980 µm		over	СН			XRFC side
PAPBL	1-3Yellow	OD)		foam				
#13	Be Cyl	Dropped						
#27	Plain	60 µm CH	unperturbed	None	60 mg/cc	Yes	6 μm Ti/1 mil Be	Pb-plastic washer
	2 Blue	(980 µm			СН		(cyl. Side)	XRFC side
	1 Yellow	OD)					Axial mount	

STATIC Targets:

Target	Target	Outer	Inner	Perturbations	Attenuator	backlighter	aperture
	name	Diameter	Diameter				
#14-15	DDCYL	525 µm	400 µm	25 μm grooves,	250 µm	6 μm Ti/1 mil Be	Pb-plastic washer
	1 Silver			m=14	thick CH	(cyl. Side)	XRFC side
	1-2Yellow					Axial mount	
#16	DDCYL	525 µm	400 µm	25 μm grooves,	None	6 μm Ti/1 mil Be	Pb-plastic washer
	2 Silver			m=14		(cyl. Side)	XRFC side
	3Yellow					Axial mount	
#17-20	DDCYL	325 µm	200 µm	25 μm grooves,	250 µm	6 μm Ti/1 mil Be	Pb-plastic washer
	3 Silver			m=14	thick CH	(cyl. Side)	XRFC side
	1-4Yellow					Axial mount	

Target	Target name	descriptor	Perturbation	Tracer	foam fill	Flash	backlighter	aperture
						Coating		
#21,28	DDCYL	16 µm CH	unperturbed	4 µm	60 mg/cc	Yes	6 μm Ti/1 mil Be	Pb-plastic washer
	1 Red	(900 µm		C8H6Cl2	CH		(cyl. side)	XRFC side
	2,5 Yellow	OD)					Axial mount	
#22,	DDCYL	26 µm CH	unperturbed	4 µm	60 mg/cc	Yes	6 μm Ti/1 mil Be	Pb-plastic washer
24, 25	1 White	(920 µm		C8H6Cl2	CH		(cyl. side)	XRFC side
	2,4,7 Yellow	OD)					Axial mount	
#26	DDCYL	20 µm CH	unperturbed	No	60 mg/cc	Yes	none	Pb-plastic washer
	1 Green	(900 µm		marker	CHCl			XRFC side
	3 Yellow	OD)						

REMOUNT Old Targets:

1/18/00

Shot Schedules SHOT SCHEDULE: Tuesday, January 18, 2000

	Target	Pulse Shape	Drive Beams	BL Set 1	BL Set 2	TIM 6
1	Pointing	1 ns square (SG1011)	On	Off	Off	QXI @ 2x
2	Pointing	1 ns square (SG1011)	On	Off	Off	QXI @ 2x
3	AWE Low Mix	1 ns square (SG1011)	On	4.0 ns delay	Off	QXI @ 8x
4	AWE High Mix	1 ns square (SG1011)	On	4.0 ns delay	Off	QXI @ 8x
5	AWE defect	1 ns square (SG1011)	On	4.0 ns delay	Off	QXI @ 8x
6	Pause	Pause	Pause	Pause	Pause	Pause
7	PAPBL	1 ns square (SG1011)	On, set 2'&3' off	Off	4.0 ns delay	QXI no snout
8	AWE Low	1 ns square (SG1011)	On	4.0 ns delay	Off	LAPC – Fe
	Mix/Fe					
9	AWE defect	1 ns square (SG1011)	On	4.0 ns delay	Off	LAPC – Ti
10	Static – large dia.	Ramp (RM2001)	Off	4.0 ns delay	Off	QXI @ 8x
11	Static – small dia.	Ramp (RM2001)	Off	4.0 ns delay	Off	QXI @ 8x

* Contingency shots at end of day will be more static targets.

Page 17

1/18/00

Between Tuesday and Wednesday, the timing of BL set 1 (beams 42, 44, 53, 57, and 62) changes to a delay of 2.0 ns (from a delay of 4.0 ns).

SHOT SCHEDULE: Wednesday, January 19, 2000

Page 18

	Target	Pulse Shape	Drive Beams	BL Set 1	BL Set 2	TIM 6
1	PAPBL	1 ns square (SG1011)	On, set 2' off	Off	4.0 ns delay	QXI no snout
2	PAPBL	1 ns square (SG1011)	On, set 2' off	Off	4.0 ns delay	QXI no snout
3	AWE High Mix	1 ns square (SG1011)	On	2.0 ns delay	Off	QXI @ 8x
4	Static – small dia.	Ramp (RM2001)	Off	2.0 ns delay	Off	QXI @ 8x
5	Pause	Pause	Pause	Pause	Pause	Pause
6	Static – large dia.	Ramp (RM2001)	Off	2.0 ns delay	Off	QXI @ 8x
7	Static – small dia.	Ramp (RM2001)	Off	2.0 ns delay	Off	LAPC – Ti
8	May target	Ramp (RM2001)	On	2.0 ns delay	Off	LAPC – Ti
9	May target	Ramp (RM2001)	On	2.0 ns delay	Off	QXI @ 8x
10	May target	Ramp (RM2001)	On	Off	Off	Off
11	Static.	Ramp (RM2001)	Off	2.0 ns delay	Off	QXI @ 8x

* Contingency shots at end of day will be more static targets.

DIAGNOSTICS DIAGNOSTIC SETTINGS, Tuesday:

Day	1: Janu	ary 18, 2000		
Shot	Туре	XRFC3/TIM3	XRFC4/TIM 4	TIM 6
1	Pointing	2x, 10 μm pinhole, 10 mil Be,	2x, 10 μm pinhole, 10 mil Be,	QXI, 2x, 10 µm pinhole, 7 mil Be,
		bias=+100V, interstrip 0.25 ns, T0-	bias=+100V, interstrip 0.25 ns, T0-	12 μ m Ti, bias=+200V, interstrip 0.2
		0.5 ns	0.5 ns	ns, T0-0.1 ns
2	Pointing	same	same	same
3	AWE Mix	6x, 10 μm pinhole, 10 mil Be,	12x, 8 μ m pinhole, 5 mil Be + 6 μ m	QXI, 8x, 10 μm pinhole,
		bias=+100V, strips fire at 0.3, 0.9,	Ti + 1 mil Be, bias=+100V,	bias=+200V, 7 mil Be, 12 μm Ti,
		4.5, & 4.9 ns	interstrip 0.25 ns, T0+4.2 ns	strip 1 @ 4.65; strip 2 @ 4.95 ns
4	AWE Mix	same	same	same
5	AWE Mix	same	same	same
6	Pause	Pause	Pause	Pause
7	PAPBL	same	same	QXI, no snout or pinholes, 20 mil
				Be, 12 μm Ti, bias=+100V, strip 1
				@ 4.65; strip 2 @ 4.95 ns
8	AWE	same	12x, 8 µm pinhole, 5 mil Be + 12.5	LAPC – Fe
	Mix/Fe		μ m Fe + 1 mil Be, bias=+100V,	
			interstrip 0.25 ns, T0+4.2 ns	
9	AWE Mix	same	12x, 8 μ m pinhole, 5 mil Be + 6 μ m	LAPC – Ti
			Ti + 1 mil Be, bias=+100V,	
			interstrip 0.25 ns, T0+4.2 ns	
10	Static	6x, 10 μm pinhole, 10 mil Be,	12x, 8 μ m pinhole, 5 mil Be + 6 μ m	QXI, 8x, 10 µm pinhole, 7 mil Be,
		bias=+100V, strips fire at 4.2, 4.8,	Ti + 1 mil Be, bias=+100V,	12 μm Ti, bias=+200V, interstrip 0.4
		5.4, & 6.0 ns	interstrip 0.4 ns, T0+5.1 ns	ns, strip 1 @ 5.5 ns; strip 2 @ 5.9 ns
11	Static	same	same	same

Diagnostic Timing Diagrams, Tuesday

DIAGNOSTIC SETTINGS, Wednesday

Day	2: Janu	ary 19, 2000		
Shot	Туре	XRFC3/TIM3	XRFC4/TIM 4	TIM 6
1	PAPBL	6x, 10 μm pinhole, 10 mil Be,	12x, 8 μ m pinhole, 5 mil Be + 6 μ m	QXI, no snout or pinholes, 20 mil
		bias=+100V, strips fire at 0.3, 0.9,	Ti + 1 mil Be, bias=+100V,	Be, 12 μm Ti, bias=+100V, strip 1
		4.5, & 4.9 ns	interstrip 0.25 ns, T0+4.2 ns	@ 4.65; strip 2 @ 4.95 ns
2	PAPBL	same	same	same
3	AWE Mix	6x, 10 μm pinhole, 10 mil Be,	12x, 8 μ m pinhole, 5 mil Be + 6 μ m	QXI, 8x, 10 μm pinhole,
		bias=+100V, strips fire at 0.3, 0.9,	Ti + 1 mil Be, bias=+100V,	bias=+200V, 7 mil Be, 12 μm Ti,
		2.5, & 2.9 ns	interstrip 0.25 ns, T0+2.2 ns	strip 1 @ 2.6; strip 2 @ 2.9 ns
4	Static	6x, 10 μm pinhole, 10 mil Be,	12x, 8 μ m pinhole, 5 mil Be + 6 μ m	QXI, 8x, 10 µm pinhole, 7 mil Be,
		bias=+100V, strips fire at 2.2, 2.8,	Ti + 1 mil Be, bias=+100V,	12 μm Ti, bias=+200V, interstrip 0.4
		3.4, & 4.0 ns	interstrip 0.4 ns, T0+3.1 ns	ns, strip 1 @ 3.5 ns; strip 2 @ 4.3 ns
5	Pause	Pause	Pause	Pause
6	Static	same	same	LAPC – Ti
7	Static	same	same	LAPC – Ti
8	May target	6x, 10 μm pinhole, 10 mil Be,	12x, 8 μ m pinhole, 5 mil Be + 6 μ m	QXI, 8x, 10 μm pinhole, 7 mil Be,
		bias=+100V, interstrip 0.4 ns,	Ti + 1 mil Be, bias=+100V,	12 μm Ti, bias=+200V, interstrip 0.4
		T0+3.1 ns	interstrip 0.4 ns, T0+3.1 ns	ns, strip 1 @ 3.5 ns; strip 2 @ 4.3 ns
9	May target	same	same	same
10	May target	same	same	same
11	Static	6x, 10 μm pinhole, 10 mil Be,	12x, 8 μ m pinhole, 5 mil Be + 6 μ m	QXI, 8x, 10 μm pinhole, 7 mil Be,
		bias=+100V, strips fire at 2.2, 2.8,	Ti + 1 mil Be, bias=+100V,	12 μm Ti, bias=+200V, interstrip 0.4
		3.4, & 4.0 ns	interstrip 0.4 ns, T0+3.1 ns	ns, strip 1 @ 3.5 ns; strip 2 @ 4.3 ns

Page 21

Diagnostic Timing Diagrams, Wednesday

Page 22

OPS	TIM Set	up Sheet			V 2.0
1 #	4	Pointing Shots T	ues 1-2		
	Paylo	bad: XRF 4	Date:		1/18/00
		Compoin			
	Ontics [.]	Campaig			
	optiool	Unimount Type	LLE std.		
		Nosecone S/N			
		Magnification	2	X	
		Pinhole Size	10	μm	
		Blast Shield	0.010" Be		
		Rear Filter Carrier S/N			
		Rear Filter	none		
		Film Back S/N			
		Pinhole Substrate	2 mil Ta LANL		
		Frame	LLE std.		
	Internal	Settings:		11/	
		Output 1 (Phosphor):		KV	Blas Offs
		Output 2 (Povorao Piao):	100	V	Strip 1
		Output 4 (PCD Bias):	100	V	Strip 2
		Reverse Bias Range		V	Strip 3
		PEN Type		ns	Strip 4
	Interstri	n Timina:		p3	
	interetin	Strip #	Setting	Delav	
		1		0	nS
		2		0.25	nS
		3		0.5	nS
		4		0.75	nS
	Steering	1			
		Points to:	тсс	,	
		φ	=	ł	
		<u>θ</u>	=	4	
	Devree C		=	1	
	Power S				
		voltage.		VDC	
	Timing:				
		Channel:			
		Inserted Delay:		nS	
		ΔT to fiducial		nS	
		Timed at	T0-0.5	nS	
	Monitor	Output			

4	Target Shots Tues	s 3-11; Weds	s 1-11			
Paylo	ad: XRF 4	Date:		1/18/00		
				1/19/00		
Ontion	Campaigr	1 CYLMIX				
Optics:			<u> </u>			
	Magnification	12				
	Pinhole Size	8				
	Blast Shield	0.005" Bo	μπ			
	Pear Filter Carrier S/N	0.005 De				
	Rear Filter	6 μm Ti + 0.001" Be				
	Film Back S/N	1				
	Pinhole Substrate	2 mil Ta LANL				
	Frame	LLE std.				
Internal S	Settings:	-				
	Output 1 (Phosphor):		kV		Bias Offse	t:
	Output 2		V		Strip 1	
	Output 3 (Reverse Bias):	100			Strip 2	
	Output 4 (PCD Bias):		V		Strip 3	
	Reverse Bias Range		V		Strip 4	
	PFN Type		ps			
Interstrip	Timing:					
	Strip #	Setting	Delay		l	
	11	_	0	nS		
	2		0.25	nS		
	3	_	0.5	nS		
	4		0.75	nS		
Steering						
	Points to:		1			
	φ =	=	ł			
	θ =	=	ł			
D	I =	=]			
Power St						
	voltage:		VDC			
Timing:						
-	Channel:					
	Inserted Delay:		nS			
	ΔT to fiducial		nS			
	Timed at	T0+4.2	nS			
Monitor C)utput					
	Scope #	Channel #		Atten:		
	Paylo Optics: Internal S Interstrip Steering Power Su Timing:	Payload: XRF 4 Campaign Optics: Unimount Type Nosecone S/N Magnification Pinhole Size Blast Shield Rear Filter Carrier S/N Rear Filter Carrier S/N Rear Filter Film Back S/N Pinhole Substrate Frame Internal Settings: Output 1 (Phosphor): Output 2 Output 3 (Reverse Bias): Output 4 (PCD Bias): Reverse Bias Range PFN Type Interstrip Timing: Iterstrip Timing: Points to:	Payload: XRF 4Date:Campaign CYLMIXOptics:Unimount TypeLLE std.Nosecone S/NMagnification12Pinhole Size8Blast Shield0.005" BeRear Filter Carrier S/N6 µm Ti +Rear Filter0.001" BeFilm Back S/NPinhole SubstratePinhole Substrate2 mil Ta LANLFrameLLE std.Internal Settings:Output 1 (Phosphor):Output 2Output 3 (Reverse Bias):Output 4 (PCD Bias):Reverse Bias RangePFN TypeInterstrip Timing:Steering12343Steering0Power SupplyVoltage:Voltage:Timing:Channel:Inserted Delay:AT to fiducialTo+4.2Monitor OutputChannel #	Payload: XRF 4 Date: Campaign CYLMIX Optics: Unimount Type LLE std. Image: Cylmic structure Magnification 12 X Magnification 12 X Pinhole Size 8 µm Blast Shield 0.005" Be 8 µm Blast Shield 0.005" Be 8 µm Blast Shield 0.005" Be Rear Filter Carrier S/N 6 µm Ti + Rear Filter 0.001" Be Film Back S/N 1 Pinhole Substrate 2 mil Ta LANL Frame Internal Settings: Output 1 (Phosphor): kV Output 2 V Output 1 (Phosphor): kV Output 2 V PFN Type ps Interstrip Timing: Strip # Setting Delay 1 0 0 0.5 4 0.75 Steering Points to: TCC Image: The setting Delay 1 0 0 1 0 0 Voltage: VDC VDC Tech Image: Tech 0 1 0 0 1 0 0 1<	Payload: XRF 4 Date: 1/18/00 Campaign CYLMIX Optics: Unimount Type LLE std. 1/19/00 Magnification 12 X 1/19/00 Magnification 12 X 1/19/00 Pinhole Size 8 µm 8 µm Blast Shield 0.005" Be 1/19/00 Rear Filter Carrier S/N 6 µm Ti + 1/19/00 Pinhole Substrate 2 mil Ta LANL 1/19/00 Internal Settings: 0utput 1 (Phosphor): KV Output 1 (Phosphor): KV 0utput 3 (Reverse Bias): 100 Output 3 (Reverse Bias): 100 00 0utput 4 (PCD Bias): V PFN Type ps 1 0 nS 2 0.25 nS 1 0 nS 2 0.25 nS 3 0.5 nS 3 0.5 nS 3 0.5 nS 1 Power Supply Voltage: VDC Timing: Channel: Inserted Delay: nS nS AT to fiducial nS nS 1 nS Timed at	Payload: XRF 4 Date: 1/18/00 Campaign CYLMIX Optics: Unimount Type LLE std. Nosecone S/N 12 X Pinhole Size 8 µm Blast Shield 0.005" Be Rear Filter Carrier S/N 6 µm Ti + Rear Filter Carrier S/N 6 µm Ti + Pinhole Substrate 2 mil Ta LANL Frame LLE std. Internal Settings: 0 Output 1 (Phosphor): kV Output 2 (Reverse Bias): 100 Output 3 (Reverse Bias): 100 Output 4 (PCD Bias): V Reverse Blas Range V PFN Type ps Interstrip Timing: 1 0 nS Strip 4 0.75 nS Steering Points to: TCC 0 0 0 8 0 0 1 0 nS 1 2 0.25 nS 3 3 0.5 nS 4 0.75 nS 1 0 9 Voltage: VDC </td

1 #	6	Pointing: Shots T	ues 1-2			-
	Paylo	ad: QXI	Date:		1/18/00	
		Campaig	n CYLMIX			
	Optics:	· · · · · · · · · · · · · · · · · · ·				
		Unimount Type	LLE std.			
		Nosecone S/N				
		Magnification	2	Х		
		Pinhole Size	LANL - 10	μm		
		Blast Shield	0.007" Be			
		Rear Filter Carrier S/N				
		Rear Filter	none			
		Film Back S/N				
		Pinhole Substrate	2 mil Ta LANL			
		Frame	LLE std.			
	Internal S	Settings:				•••
		Output 1 (Phosphor):		kV	Bias	Offset
		Output 2		V	Strip	1
		Output 3 (Reverse Bias):	200		Strip	2
		Output 4 (PCD Bias):		V	Strip	3
		Reverse Blas Range		V	Strip	4
	I			ps		
	Interstrip	I Iming:	Catting	Delay		
					<u> </u>	
		1			<u>s</u>	
		2		0.2 11	<u>s</u>	
				n -	<u>s</u>	
		4		<u> </u>	3	
	Steering					
		Points to:	Backlighter	1		
		ф =		1		
		на н				
	Power Si		-	l		
		Voltage:		VDC		
	Timing:					
	-	Channel:				
		Inserted Delay:		nS		
		ΔT to fiducial		nS		
		Timed at	T0-0.1	nS		
	Monitor C	Dutput	-			
		0	Channel #		A ++ a a	

#	6	Racklighter Monit	or: Shots Tu	105 3-1	LL 5 10_11·	E Mode
π	Davia				<i>J</i> , <i>IU</i> - <i>II</i> ,	W eus
	Faylo		Date:		1/18/00	
		Campaign			1/19/00	
	Optics:	pg				
	•	Unimount Type	LLE std.			
		Nosecone S/N				
		Magnification	8	Х		
		Pinhole Size	10	μm		
		Blast Shield	0.007" Be			
		Rear Filter Carrier S/N				
		Rear Filter	12 μ m Ti			
		Film Back S/N				
		Pinhole Substrate	2 mil Ta LANL			
		Frame	LLE std.			
	Internal S	Settings:				
		Output 1 (Phosphor):		kV	Bi	as Offse
		Output 2		V	St	rip 1
		Output 3 (Reverse Bias):	200		St	rip 2
		Output 4 (PCD Bias):		V	St	rip 3
		Reverse Bias Range		V	St	rip 4
		PFN Type		ps		
	Interstrip	Timing:				
		Strip #	Setting	Delay		
		1		0 r	۱S	
		2		0.3 r	1S	
		3		r	1S	
		4		r	ıS	
	Steering					
	5	Points to:	Backlighter			
		φ =	= 162.0°	ļ		
		θ =	= <u>116.6°</u>	ļ		
		T =	= 1.625 mm			
	Power Su	ipply				
		Voltage:		VDC		
	Timina					
		Channel:				
		Inserted Delay:		nS		
		ΔT to fiducial	_	nS		
		Timed at	T0+4.65	nS		
	Monitor C	Output				
		Scope #	Channel #		Atton:	

ш	6		- 7 14/ /			
Ħ	0	PAPBL: Shots Tu	es 7; Weds 1	1-2		
	Paylo	ad: QXI	Date:		1/18/00	
		no pinhole array			1/19/00	1
		Campaigr	n CYLMIX			
	Optics:		1		1	
		Unimount Type	LLE std.			
		Nosecone S/N				
		Magnification	NA	Х		
		Pinhole Size	NA	μm		
		Blast Shield	0.020" Be			
		Rear Filter Carrier S/N				
		Rear Filter	12 μm Ti			
		Film Back S/N				
		Pinhole Substrate	2 mil Ta LANL			
		Frame	LLE std.			
	Internal S	Settings:			I	
		Output 1 (Phosphor):		kV		Bias Offse
		Output 2		V		Strip 1
		Output 3 (Reverse Bias):	100			Strip 2
		Output 4 (PCD Bias):		V		Strip 3
		Reverse Bias Range		V		Strip 4
		PFN Type		ps		
	Interstrip	Timing:				
		Strip #	Setting	Delay		-
		1		0	nS	4
		2		0.3	nS	4
		3			nS	4
		4			nS]
	Steering					
	U	Points to:	тсс	-		
		φ =	=	1		
		θ =	=	1		
		T =	= 200 mm	Locati	on of	
	Power Su	ıpply		micro	channel pl	ate
		Voltage:		VDC		
	-					
	i iming:	Ohannah			l	
		Inserted Delay:	_	<u>ns</u>		
			T0 1 4 65	ns		
	Mariller		10+4.65	ทธ		
	Monitor C		Charact #		۸ ۲۲ -	
			iiinannel #			

Ω XOPS	TIM Setu	ıp Sheet			L	V 2.0	10/7/00
TIM #	3	Pointing Shots 1-	2				
	Paylo	ad: XRF 3	Date:		1/18/00		
		Campaig					
	Optics:	Campaig					
	• • • • • •	Unimount Type	LLE std.				
		Nosecone S/N					
		Magnification	2	X			
		Pinhole Size	10	μm			
		Blast Shield	0.010" Be				
		Rear Filter Carrier S/N					
		Rear Filter	none				
		Film Back S/N					
		Pinhole Substrate	2 mil Ta LANL				
		Frame	LLE std.				
	Internal S	Settings:					
		Output 1 (Phosphor):		kV		Bias Offset	t:
		Output 2		V		Strip 1	
		Output 3 (Reverse Bias):	100			Strip 2	
		Output 4 (PCD Bias):		V		Strip 3	
		Reverse Bias Range		V		Strip 4	
		PFN Type		ps	1		
	Interstrip	Timing:					
		Strip #	Setting	Delay			
		1		0 n	S		
		2		0.25 n	S		
		3		0.5 n	S		
		4		0.75 n	S		
	Steering						
	J	Points to:	тсс	-			
		φ =	=	1			
		θ =	=	1			
		T :	=				
	Power S	upply					
		Voltage:		VDC			
	Timing:						
		Channel:					
		Inserted Delay:	_	nS			
		ΔT to fiducial		nS			
		Timed at	T0-0.5	nS			
	Monitor C	Dutput					
		Scope #	Channel #		Atten:		
	Authorize	d by G. Pien	Confirmed by:				

KOPS	TIM Setup	o Sheet			V 2.0 10/7
M #	3	Target Shots Tues	3-11; Weds	; 1-1 :	1 1
	Payloa	ad: XRF 3	Date:		1/18/00
	•				1/19/00
		Campaign	CYLMIX		
	Optics:				1
		Unimount Type	LLE std.		4
		Nosecone S/N			4
		Magnification	6	Х	4
		Pinhole Size	10	μm	4
		Blast Shield	0.010" Be		4
		Rear Filter Carrier S/N			4
		Rear Filter	none		4
		Film Back S/N			4
		Pinhole Substrate	2 mil Ta LANL		4
		Frame	LLE std.]
	Internal Se	ettings:			1
		Output 1 (Phosphor):		kV	Bias Offset:
		Output 2		V	Strip 1
		Output 3 (Reverse Bias):	100		Strip 2
		Output 4 (PCD Bias):		V	Strip 3
		Reverse Bias Range		V	Strip 4
		PFN Type		ps]
	Interstrip	Timing:	• • • •		
		Strip #	Setting	Delay	
		1		0	nS
		2		0.6	nS
		3		4.2	nS
		4		4.6	nS
	Steering				
		Points to:	тсс		
		φ =			
		θ =			
		T =			
	Power Su	pply		-	_
		Voltage:		VDC	
	Timing:				7
		Channel:			4
		Inserted Delay:	-	nS	4
		ΔT to fiducial		nS	4
		Timed at	T0+0.3	nS	J
	Monitor Ou	utput			· · · · · · · · · · · · · · · · · · ·
		Scope #	Channel #		Atten:
	Authorized	by G. Pien	Confirmed by		

X-ray Streak Came	era Con	figurat	tion Re	quest	Date	12/22/99
-		-	request #		For official	use only
Date needed Requester Campaign	1/18/00 Steve Batl CYLMIX; L	ha; (505) 6 ANL ID-00	65-5898)-01			
Purpose of Diagnostic Streak Camera TIM#	Observe C SSC1 2	Cl emission SSC4	from mark SSCA	er layer LXS		
Pointing	TCC					
Photocathode substrate	parylene	.5 mil Be	1 mil Be	other		
fluffv	Au	N	available	only for Cs	and KBr	
fiducial	Ý	N	not availa	ble with 50	00 μm slit	
slit width	250 μm	330 µm	500 µm	1500 µm	5000 µm	
grid (1.5 mm spacing)	none	50 µm	75 µm			
Imager SMP	Y 10x	N 20x	fiducial no	ot available	with Imager	S
other requirements	V	N				
Preferred Spectrometer	Ar	Xe	a	Al-1 Al-2	LXS-1 LXS-2	don't care
Preferred Crystal	RbAP	ADP	PET	Quartz	other:	don't care
Desired Range:	Min. 2.5	center	Max. 3.6	keV	NOTE: if w	ider
				Ang.	coverage a	available
Blast Shield	Po	othor			want more	to red.
Thickness	00//"	other:	3 mil			
Filtering	.004	ouner.	JIII			
Material	Be	AI	Fe	Ti	other:	Be
Thickness	.001"	.002"	.0005"	<mark>9μm</mark>	other:	0.0005"
Intensifier Gain	max					
Sweep Speed	3.2 ns/full	sweep				
Timing wrt T0	1.5	ns	at center	of sweep		
X-ray Streak Camera Co	nfiguratio	n Reques	st (cont.)		Date	12/22/99
To be completed by assemb	lor:		request #		_ For official	use only
Photocathode installed Photocathode ID #	/_/	:		-		
Fiducial fiber installed	//	:				
comments						
Spectrometer complete spectrometer name	// Ar	: Xe	Q	Al-1	LXS-1	
crvstal	RbAP	ADP	PET	Quartz	other:	
expected range:	Min.	center	Max.		5	
				keV		
comments				Angstrom	s	
Imager complete comments	//	:		-		
Front end attached to str Fiducial fiber secured wit Sweep Speed set to: Switches set? (electron	reak camera hin limits of 1 optics on, b	a with mini TIM boat? 2 ias on, inte	mum of 3 s 3 ensifier on,	screws? 4 gain set)	Y Y 5 Y	N N N
comments	//	`		-		

Backlighter Studies

Experimental Proposal Template

• Experiment title, principal investigator's name, and, if related to LLE direct-drive experimental program, which category (i.e., ISE, RTI, etc.) the experiment falls under, and planned shot dates.

Title: X-ray Backlighter Development

PI: Jonathan Workman

Date: January 20, 2000

• Summary of the experiment's objectives.

The X-ray Backlighter Development shots will have as their objective measurements of x-ray yield at high x-ray energies. In particular, the yield of 6.7 keV x-ray emission from iron disk targets will be measured as a function of laser intensity. In addition, we will study the yield of 10.3 keV x-ray emission from Ge disk targets at high laser irradiance.

- Laser conditions required for the experiment:
 - Pulse shape

•

SG1011 (1 ns square)

nominal 450 J/beam

- SSD, DPP, and DPR conditions No phase plates, No SSD (use Main Driver)
- Power/energy balance
- Number of beamlines and target pointing summary requirements *12 beams should be configured in two cones around H7 all pointed to TCC.*
- Backlighting requirements and beam timing delays *None. Main beams will be used for target illumination.*
- Special laser conditions *None*.
- 4) Diagnostics required and target chamber port assignments (indicate any non-LLE-provided diagnostics).

TIM#1: TIM#2:	XRFC2@6X LAPC@2X (Los Alamos Pinhole Camera) non-LLE, previously used on OMEGA in July '99.
TIM#3:	Empty
TIM#4:	Empty
TIM#5:	<u>XRFC4@12X</u> and @6X
TIM#6:	SSCA

In addition: P2B

Henway Spectrometer All XRPHCs P510s Plasma calorimeters

DDCYLMIX 00-1 and Backlighter Studies

5) Type and number of targets including number of spares (this section must be completed even if using non-LLE-provided targets). NOTE: if special targets are required, they must be specified more than two months in advance. Additionally, special target geometries may require metrology prior to delivery to LLE and verification after arrival at LLE using LLE's Powel scope.

All targets will be provided by LANL. 20 disk targets will be constructed for the 12 laser shots. 12 of these targets will be 1 mm disks with alignment flags, either Fe or Ge. 6 targets will consist of 3 mm Fe disks with a half-circle of Au used for MTF measurements. The remaining targets are 3 mm Ti disks. All targets will be of thickness 0.5 to 3.0 mil. Targets will be oriented normal and centered with the H7-H14 axis.

6) Number of required laser shots.

12 laser shots will be required. This experiment has been allotted 1 full day.

7) Special shot schedule considerations associated with experiment.

There will not be any diagnostic port changes during this day of shots. There will be at most 2 filter and diagnostic snout changes during the day. As shown in the summary, XRFC4 changes from 12X to 6X before and during shot 5. In addition, there will be a filter change and SSC snout change at this time (shot 5). Finally there will be a filter change after shot 11.

Beams Used for Backlighter Studies TARGETS Fe targets with MTF edge for OMEGA Jan.FY'00

Construction Type	Quantity Needed	Already Available
Fe disk (2.5 mm) with MTF	6	NO
Fe disk (1.0 mm) with flags	3	NO
Ge disk (1.0 mm) with flags	9	NO
Ti disk (3 mm)	2	YES

Configuration for LAPC for the week of 1-17-00 on OMEGA

The LAPC will be used on OMEGA to measure absolute x-ray yield. In order to make these measurements we will use an x-ray step wedge in front of the film pack. Below will be described the various thickness of materials as well as the pre and post filters used to minimize fluorescence. The LAPC is being used in a *non-standard* configuration. There will be no pinhole/ collimator array at the front of the device rather an open snout with filter materials. We use the 2X nosecone as a pre-filter holder located at some distance from the main filter array.

Below is sketched the general configuration of the LAPC. The first filter in the 2x nosecone is a piece of plastic. This will help mitigate hot-electrons and is designed to be 100 μ m thick. The next filter element is a thick piece of Be (20 mil) used as a blast shield but also as an attenuator for low energy x-rays (<2.0 keV). The final element in the nosecone is an Fe filter (this should be Ti for Ti emission) which will be used both for Fe and Ge emission. This filter helps select the He-like emission from Fe and helps eliminate moderate energy emission from Ge. This high-Z filter is placed in the nosecone with the consideration that the fluorescence will be significant. Because the fluorescent emission goes into 4π the distance from the DEF film will reduce the fluorescent irradiance by $1/r^2$.

The Al step wedge comes next. This is comprised of 16 channels with varying attenuation for the emission of interest. Al has been chosen over Ti due to the much lower fluorescent yield. This, however, leads to large thicknesses of Al in order to have an appropriate dynamic range of transmission. Another

thick Be filter is placed behind the Al step wedge. This Be filter reduces any fluorescence from the Al filter wedge. A 10 mil piece of Be will reduce the Al K_{β} at 1.557 keV by a factor of 1500 and will reduce the K_{α} at 1.486 keV by a factor of 5300. A separate 1 mil piece of Be is used simply as a light-tight filter for the DEF film. Finally, 5 pieces of DEF film will be stacked in the film holder. In the July '99 shots (as well as previous work in Zn by Chrien et. Al) this film stacking was found to reduce fluorescence significantly.

In the tables below are listed the thicknesses of Al to be used in the step wedges and alongside the transmissions of the energies of interest. The array for Ge is essentially the same as for Fe with an additional 8 mil of Al over the entire array. The array for Ti will need to be separate as the thicknesses required are significantly less. Г

12

20

28

36

16

24

32

40

1/18/2000

Transmission @6.7 keV Fe

Fe emission array

Ge emission array

4	8	12	16	mil Al
12	16	20	24	
20	24	28	32	
28	32	36	40	

20

28

36

44

24

32

40

48

mil Al

Т

Т

Т

1.12E-01	1.24E-02	1.39E-03	1.55E-04
1.39E-03	1.55E-04	1.72E-05	1.92E-06
1.72E-05	1.92E-06	2.14E-07	2.39E-08
2.14E-07	2.39E-08	2.67E-09	2.97E-10

Transmission @10.35 keV Ge

1.54E-01	8.28E-02	4.44E-02	2.38E-02
4.44E-02	2.38E-02	1.28E-02	6.85E-03
1.28E-02	6.85E-03	3.67E-03	1.97E-03
3.67E-03	1.97E-03	1.06E-03	5.67E-04

Transmission @4.75 keV Ti

2.28E-01	5.20E-02	1.18E-02	2.70E-03
1.18E-02	2.70E-03	6.16E-04	1.40E-04
6.16E-04	1.40E-04	3.20E-05	7.29E-06
3.20E-05	7.29E-06	1.66E-06	3.79E-07

Ti emission a	array
---------------	-------

1	2	3	4	mil Al
3	4	5	6	
5	6	7	8	
7	8	9	10	

Materials and thicknesses to be used in LAPC Jan 2000 on OMEGA

Target	CH prefilter	Be prefilter	Other Prefilter	Wedge	Rear Be filter
Fe	100 µm	20.0 mil	Fe 0.5 mil	Al 4 mil steps	20 mil
Ge	100 µm	20.0 mil	Fe 0.5 mil	Al 4 mil steps +8	20 mil
Ti	100 µm	20.0 mil	Ti 0.5 mil	Al 1 mil steps	20 mil

Page 37

<u>Channel</u>	<u>Prefilter</u>	Crystal Mount	<u>Crystal</u>
А	Be 1mil	А	RAP
В	Al 6um	А	PET
С	Al 6um	Р	KAP
D	Be 1mil	Q	KAP

As far as I am aware the Henway has been left in the configuration below:

I would like the configuration changed as follows:

Channel	Prefilter	Crystal Mount	<u>Crystal</u>	Spectra
А	Be 1mil	А	RAP	Ti
В	Al 6um	А	PET	Ti+Fe
С	Al 6um	Q	PET	Ti+?Fe
D	Be 1mil	А	Si<111>	Ge

The A and B channels remain unchanged while the C and D channels require new crystal mounts. The Q/PET crystal to go into channel C is out at Rochester. The A/Si crystal is being mounted by LANL and will be brought out for installation on Friday or Monday.

There will be additional prefilters in order to increase the dynamic range of the instrument. The additional prefilters will consist of three equal size channels oriented along the width of the crystal. The first channel will be open.

Henway channel	Filter channel #1	Filter channel #2	Filter channel #3
А	Open	1.5 mil Al	3.0 mil Al
В	Open	4.0 mil Al	9.5 mil Al
С	Open	1.5 mil Al	3.0 mil Al
D	Open	2.0 mil Ti	4.0 mil Ti

The filter holder is 3/4"x1/2". Therefore, each filter channel should be ~1/4"x1/2".

DDCYLMIX 00-1 and Backlighter Studies

Filter	Ti trans (4.75)	Fe trans (6.70)	Ge trans (10.28)
1.5 mil Al	.112	.444	
2.0 mil Al	5.20e-2	.334	
3.0 mil Al	1.25e-2	.197	
4.0 mil Al	2.70e-3	.112	
4.5 mil Al			
5.0 mil Al	6.16e-4	6.44e-2	
8.0 mil Al		1.24e-2	
9.5 mil Al		5.51e-3	
10.0 mil Al	3.79e-7	4.15e-3	0.211
2.0 mil Ti		4.56e-4	9.11e-2
4.0 mil Ti		2.08e-7	8.31e-3

Transmissions for the various filters at Ti, Fe and Ge He-like emission energies

Summary of Shot Schedule and Diagnostics

Shot Schedule for FY'00 Backlighter Development on OMEGA v2.1

Shot #	Target	beamlines	Focus	Pulse	Res Targ	Purpose	Laser Intensity X10 ¹⁵ W/cm ²	Diagnostics
1	Fe	13,18,24, 59,66,67	defocused to 600 μm	1 ns	MTF	Intensity scaling, spatial resolution	0.94	LAPC,Henway,SSCA, XRFC2@6X,XRFC4@12X
		Check filn	n and diagnos	tics (point	ing,timing,filt	ration)		
2	Fe	13,18, 66,67	defocused to 600 μm	1 ns	MTF	Intensity scaling, spatial resolution	0.63	LAPC,Henway,SSCA, XRFC2@6X,XRFC4@12X
3	Fe	13,67	defocused to 600 μm	1 ns	MTF	Intensity scaling, spatial resolution	0.32	LAPC,Henway,SSCA, XRFC2@6X,XRFC4@12X
4	Fe	13,18,24, 59,66,67	defocused to 300 μm	1 ns	MTF	Intensity scaling, spatial resolution	3.8	LAPC,Henway,SSCA, XRFC2@6X,XRFC4@12X
	XRF	C4 change fro	om 12X to 6X (low priorit	y: before and	during shot 5)		
5	Fe	13,18,24, 59,66,67	tight focus- overlaped	1 ns		Intensity scaling, energy scaling, spatial resolution	54	LAPC,Henway,SSCA, XRFC2@6X,XRFC4@6X
Streak snout change during shot #6, filter changes between shots								
Shot #	Target	No. beams	Focus	Pulse	Res Targ	Purpose	Laser Intensity X10 ¹⁵ W/cm ²	Diagnostics
6	Ge	13,18,24, 59,66,67, 11,14,32, 47,68,69	tight focus- overlaped	1 ns		Intensity scaling, high- energy	107.0	LAPC,Henway,SSCA, XRFC2@6X,XRFC4@6X
7	Ge	13,18,24, 59,66,67	tight focus- overlaped	1 ns		Intensity scaling, high- energy	53.7	LAPC,Henway,SSCA, XRFC2@6X,XRFC4@6X
8	Ge	13,18,24, 59,66,67, 11,14,32, 47,68,69	tight focus- overlaped	1 ns		Intensity scaling, high- energy	107.0	LAPC,Henway,SSCA, XRFC2@6X,XRFC4@6X
9	Ge	13,18,24, 59,66,67	tight focus- overlaped	1 ns		Intensity scaling, energy scaling, high-energy	53.7	LAPC,Henway,SSCA, XRFC2@6X,XRFC4@6X
10	Ge	13,67	tight focus- overlaped	1 ns		Intensity scaling, high- energy	17.9	LAPC,Henway,SSCA, XRFC2@6X,XRFC4@6X
11	Ge	13	tight focus- overlaped	1 ns		Intensity scaling, high- energy	9.0	LAPC,Henway,SSCA, XRFC2@6X,XRFC4@6X
			Filter changes	Not run	ning SSC			
12	Ti	13	defocused to 300 μm	1 ns		Compare to Trident 2ω vs 3ω	6.4x10 ¹⁴ W/cm ²	LAPC,Henway, XRFC2@6X,XRFC4@6X

TIM Setup Sheets

#	6	Shots 1-5			-
	Pavlo	ad: SSC A	Date		1/20/00
	i ajio	Previous Shot	#	•	1/20/00
		Campaigr	" I ANI Backlig	hter Dev	elonment
	Optics:	Campaig			Jopinoin
		Nosecone S/N			
		Tune for	F	e	
		Blast Shield	0.004" Be		
		Photocathode Assy. #			
		Photocathode Type	Au		
		Photocathode Slit	250	μm	
		Rear Filter Carrier S/N			
		Rear Filter	0.001" Be		
	Internal S	ettings:		4	
		Sweep Speed Setting		1	
		Deflection Plates	0	N	
		MCP Power	0	N	
		Electron Optics Power	Uiah	N	
	Esternal	Gain	High		
	External	Settings:			
		Steering	TCC		
				-	
		<u> </u>		_	
		T	<u> </u>	_	
		L I			
		Power Supply			
		Voltage:		VDC	
		<u> </u>			
		Timing:			
		Channel:			
		Inserted Delay:		nS	
		ΔT to fiducial		nS	
		Timed at	T-0	nS	
		Monitor Output			
		Scope # TDS 684 CPIP	2 Channel #		
		Input Attenuation:			
	.		0 1 1		

		ngurat	request #	quest	Date For official	use only
Date needed Requester Campaign	1/20/99 Mo Jonathan V X-ray Back	orning Vorkman dighters	1040001			
Purpose of Diagnostic Streak Camera	Time Histo	ry of Fe ba	cklighter en	nission L XS		
TIM# Pointing	6 TCC					
Photocathode						
substrate material	paralene Au	.5 mil Be Csl	1 mil Be KBr	other: other:		
fluffy fiducial	Y	N	available c	only for CsI a	and KBr 0 um slit	
slit width	250 μm	330 μm	500 µm	1500 μm	5000 μm	
grid (1.5 mm spacing)	none	50 μm	75 μm	t available v	with Imagors	
SMP other requirements	10x	20x	nuuciai no		nur imagers	
Spectrometer	Y	N	Q			
Preferred Spectrometer	Ar RhAP		PET	AI-1 AI-2 Quartz	LXS-1 LXS-2	don't care
	1.07.1	7,01		Quartz	ourier.	don't care
Desired Range:	Min.	center 6.7	Max.	keV Angstroms		
Blast Shield				, angoa onno		
Material Thickness Filtering	Be .004"	other: other:				
Material	Be	AI	Fe	Ті	other:	
Thickness Intensifier Gain	.001" max	.002"	.0005"	9µm	other:	
Sweep Speed Timing wrt T0	1 0.5	ns	centered			
-ray Streak Camera Co	nfiguratio	n Reques	t (cont.)		Date	
a ha completed by accomb	lor	-	request #		For official	use only
Photocathode installed Photocathode ID # comments	/_/ 	<u>:</u>				
Fiducial fiber installed comments	/_/	:				
Spectromator complete	//	:		AL 1		
	AI	ve	u	AI-1	1 X S-2	
spectrometer name				AI-2	L/(0-2	
spectrometer name crystal	RbAP Min	ADP center	PET Max	Quartz	other:	
spectrometer complete spectrometer name crystal expected range:	RbAP Min.	ADP center	PET Max.	AI-2 Quartz keV Angstroms	other:	
crystal expected range:	RbAP Min.	ADP center	PET Max.	AI-2 Quartz keV Angstroms	other:	
crystal expected range: comments	RbAP Min. 	ADP center	PET Max.	AI-2 Quartz keV Angstroms	other:	
crystal expected range: comments Imager complete comments Front end attached to str	RbAP Min. 	ADP center	PET Max.	AI-2 Quartz keV Angstroms 	other:	 N
crystal expected range: comments Imager complete comments Front end attached to str Fiducial fiber secured wit	RbAP Min.	ADP center	PET Max.	AI-2 Quartz keV Angstroms 	Y 5	 N

	The Setup	Sheet			V 2.0 10/7
ГІЛЛ #	6	Chata 6 11			
<i></i>	U .	Snots 6-11			
	Payloa	ad: SSC A	Date	e:	1/20/00
		Previous Shot #	ŧ		
		Campaign	: LANL Backlig	ghter Develo	opment
	Optics:				
		Nosecone S/N		2.	
		Plast Shield	0.004" Po	5e	
		Photocathode Assy #	0.004 De		
		Photocathode Type	Διι		
		Photocathode Slit	250	μm	
		Rear Filter Carrier S/N	200		
		Rear Filter	0.001" Be		
	Internal Se	ettings:			
		Sweep Speed Setting		1	
		Deflection Plates	(N	
		MCP Power	(DN	
		Electron Optics Power	(DN	
		Gain	High		
	External	Settings:			
		Steering	TCC		
		TO BL1			
		φ =	:		
		$\theta = -$	=		
] =			
		Power Supply			
		Voltage:		VDC	
		Voltage.		VDC	
		Timina:			
		Channel:			
		Inserted Delay:		nS	
		ΔT to fiducial		nS	
		Timed at	T-0	nS	
		Monitor Output	1		
		Scope # TDS 684 GPIB 2	Channel #		
		Input Attenuation:			
	Authorized	by G. Pien	Confirmed by	:	

···· , ·····			request #		For official	use only
Date needed Requester	1/20/99 At Jonathan \	fternoon Norkman				,
Campaign	X-ray Bac	klighters				
Purpose of Diagnostic	Time Histo	ory of Ge ba	acklighter er	mission		
Streak Camera	SSC1	SSC4	SSCA	LXS		
TIM#	6 T00					
Pointing	ICC					
Photocathode						
substrate	paralene	.5 mil Be	1 mil Be	other:		
material	Au	Csl	KBr	other:		
fluffy	Y	Ν	available o	only for Csl	and KBr	
fiducial	Y	N	not availab	ole with 500	00 μm slit	
slit width	250 μm	330 µm	500 µm	1500 µm	5000 µm	
grid (1.5 mm spacing)	none	50 µm	75 µm			
Imager	Y	N	fiducial not	available	with Image	s
SMP	10x	20x				
other requirements						
Spectrometer	Y	N				
Preferred Spectrometer	Ar	Xe	a	Al-1	LXS-1	don't care
				AI-2	LXS-2	
Preferred Crystal	RbAP	ADP	PET	Quartz	other:	
						don't care
Desired Range:	Min.	center	Max.	11/		
	9.8	10.3	10.8	Kev An antronoo		
Plant Shield			·/	Angstroms		
Material	Bo	other				
Thickness	004"	other:				
Filtering	.004	ouner.				
Material	Be	AI	Fe	Ті	other:	
Thickness	.001"	.002"	.0005"	9μm	other:	
Intensifier Gain	max			•		
Sweep Speed	1					
Timing wrt T0	0.5	ns	centered			
5						
X-ray Streak Camera Co	nfiguratio	n Reques	st (cont.)		Date	
			request #		For official	use only
To be completed by assemb	ler:					
Photocathode installed	//	:				
Photocathode ID #						
comments						
Fiducial fiber installed	/_/	:				
comments						
Sportromator complet-	, ,					
spectrometer complete	// A r	:		ΔΙ 1		
spectrometer name	AI	VE	u	ΔI-2	1 20-1	
crystal	Rh∆₽		PET	AI-Z	chor	
expected range.	Min	center	Max	Qualtz	ouiei.	
expected range.		oontoi	Max.	keV		
				Anastroms		
comments						
Imager complete	/_/	:				
comments						
Front end attached to st	reak camer	a with mini	imum of 3 s	crews?	Y	N
Fiducial fiber secured wit	thin limits of	TIM boat?	?		Y	N
Sweep Speed set to:	. 1	. 2	3	4	5	N
- WITCHCO COT / (CLOOTTOP	· · · ·				~	
Switches set? (election	optics on, t	bias on, inte	ensilier on,	gain set)	T	IN
Streak Camora delivered		bias on, inte	ensiner on,	gain set)	T	IN

X-ray Streak Camera Configuration Request Date

XOPS	TIM Setu	p Sheet				V 2.0	10/7/00
					<u>L</u>	A	
IM #	1	Shots 1-5			L		
	, Davlo	ad: XRE #2	Deter		1/20/00		
	i ayio		Dale.		1/20/00		
		Previous Shot #	LANI Deeklight	ar Dav	alanmant		
	Ontics	Campaign	LANL Dacklight	ler Dev	elopment		
	Oplics.		I I E std		l		
		Nosecone S/N					
		Magnification	6	x			
		Pinhole Size	10	μm			
		Blast Shield	0.010" Be				
		Rear Filter Carrier S/N	anv				
		Rear Filter	12 μm Fe				
		Film Back S/N	·				
		Pinhole Substrate	2 mil Ta LANL				
		Frame	LLE std.				
	Internal S	ettings:					
		Output 1 (Phosphor):		kV		Bias Offse	et:
		Output 2		V		Strip 1	
		Output 3 (Reverse Bias):	100			Strip 2	
		Output 4 (PCD Bias):		V		Strip 3	
		Reverse Bias Range		V		Strip 4	
		PFN Type		ps			
	Interstrip	Timing:	•				
		Strip #	Setting	Delay			
		1	00		nS		
		2	00	0.4	nS		
		3	00	0.8	nS nS		
		4	00	<u> </u>	15		
	Steering						
	Steering	Points to:	TCC				
		$\phi =$		1			
		$\varphi = \theta$		1			
		T =		1			
	Power Su			1			
		Voltage:	15	VDC			
	Timing:						
	U	Channel:					
		Inserted Delay:	_	nS			
		ΔT to fiducial		nS			
		Timed at	T-0.1	nS			
	Monitor O	output			-		_

XOPS	TIM Setu	p Sheet				V 2.0	10/7/00
						F	
M #	1	Shots 6-11					
1 V 1 TT	, Dovlo	onois 0-11	Deter		4/00/00		
	Faylo		Date:		1/20/00		
		Previous Shot #					
	Ontion	Campaign	LANL Backlight	ter Dev	elopment		
	Optics:		LLE atd		1		
		Magnification	6	x			
		Pinhole Size	10	um			
		Blast Shield	0.010" Be	μ			
		Rear Filter Carrier S/N					
		Rear Filter	12 μm Fe				
		Film Back S/N		1			
		Pinhole Substrate	5 mil Ta LANL				
		Frame	LLE std.				
	Internal S	ettings:					
		Output 1 (Phosphor):		kV		Bias Offse	t:
		Output 2		V	[[Strip 1	
		Output 3 (Reverse Bias):	100			Strip 2	
		Output 4 (PCD Bias):		V		Strip 3	
		Reverse Bias Range		V		Strip 4	
		PFN Type		ps			
	Interstrip	Timing:					
		Strip #	Setting	Delay	-		
		1	00	0	nS		
		2	00	0.4	nS		
		3	00	0.8	nS		
		4	00	1.2	nS		
	Stearing						
	Steering	Points to:	TCC				
				1			
		$\psi = 0$		-			
		T =		-			
	Power Su			1			
	1 01101 00	Voltage:	15	VDC			
	Timing:						
	5	Channel:					
		Inserted Delay:		nS			
		ΔT to fiducial	•	nS			
		Timed at	T-0.1	nS			
	Monitor O	utput			•		_

OPS	TIM Setup	Sheet			V 2.0 10/7/00
1 #	1	Shot 12			
	Payloa	nd: XRF #2	Date:		1/20/00
		Previous Shot #			
	0	Campaign	LANL Backlight	ter Dev	elopment
	Optics:				
			LLE SIU.		
		Nosecone S/N	6		
		Ripholo Sizo	10		
		Plast Shield	0.010" Bo	μπ	
		Poor Filter Carrier S/N	0.010 Be		
		Real Filter Carrier 3/N	12 µm Ti		
		Film Back S/N			
		Pinhole Substrate	2 mil Ta I ANI		
		Frame	LIF std		
	Internal Se	attings:	LLL Stu.		
	internal Se	Output 1 (Phosphor):		k\/	Bias Offset
		Output 2		V	Strip 1
		Output 3 (Reverse Bias):	100	V	Strip 2
		Output 4 (PCD Bias):	100	V	Strip 2
		Reverse Bias Range		v	Strip 4
		PFN Type		ps	
	Interstrip 1	limina:			
	•	Strip #	Settina	Delav	
		1			nS
		2		0.4	nS
		3		0.8	nS
		4		1.2	nS
	Steering				
		Points to:	ТСС	-	
		φ =		4	
		$\theta =$		4	
	-	T=			
	Power Sup	oply			
		Voltage:	15	VDC	
	Timing:				
		Channel:			
		Inserted Delay:		nS	
		ΔT to fiducial		nS	
		Timed at	T-0.1	nS	
		itout			
	Monitor OL				

						V 2.0	10/7/0
#	5	Shots 1-4				- 71	
	Payloa	nd: XRF #4	Date:		1/20/00		
		Previous Shot #					
	Ontion	Campaign	LANL Backlight	er Dev	elopment		
	Oplics.	Unimount Type	IIE etd				
		Nosecone S/N					
		Magnification	12	x			
		Pinhole Size	12	um			
		Blast Shield	0.010" Bo	μπ			
		Rear Filter Carrier S/N					
		Rear Filter	12 µm Fe				
		Film Back S/N					
		Pinhole Substrate	2 mil Ta I ANI				
		Frame					
	Internal Sc		LLE SIU.				
	internal Se	Output 1 (Phosphor):		W/	Bi	as Offen	
		Output 7 (Filosphor).				as Olise rin 1	:
		Output 2 (Reverse Bias):	100	v		$\frac{11p}{rin}$	
		Output 4 (PCD Bias):	100	V		rip 2	
		Reverse Bias Pange		V		rip 1	
				v ne	101		
	Intoretrin 1	[FFN Type [imina:		με			
	interstrip	Strip #	Setting	Delay			
		1	0etting 00		nS		
		2	00		nS		
		3	00	0.4	nS		
		4	00	1.2	nS		
	Steering						
	-	Points to:	тсс	_			
		φ =					
		θ =]			
		T =					
	Power Sup	oply					
	-	Voltage:	15	VDC			
	Timing:						
	_	Channel:					
		Inserted Delay:		nS			
		ΔT to fiducial	- 	nS			
		Timed at	T-0.1	nS			
	Monitor Ou	Itput			·		_

PS	TIM Setup	Sheet			V 2.0	10/7/0
					<u>LIA 💥</u>	
#	5	Shat 5				
#	5	51101 5				
	Payloa	nd: XRF #4	Date:		1/20/00	
		Previous Shot #				
	•	Campaign	LANL Backlight	ter Dev	elopment	
	Optics:	Lining a such True a		1	1	
		Unimount Type	LLE Sta.			
		Nosecone S/N	C			
		Magnification	10	A A A A A A A A A A A A A A A A A A A		
		Plast Shield	0.010" Bo	μπ		
		Poor Filter Carrier S/N				
		Rear Filter	12 µm Fe			
		Film Back S/N	12 µ111 0			
		Pinhole Substrate	2 mil Ta I ANI			
		Frame	LLE std.			
	Internal Se	ettinas:			1	
		Output 1 (Phosphor):		kV	Bias Offse	et:
		Output 2		V	Strip 1	
		Output 3 (Reverse Bias):	100		Strip 2	
		Output 4 (PCD Bias):		V	Strip 3	
		Reverse Bias Range		V	Strip 4	
		PFN Type		ps		
	Interstrip 1	Fiming:				
		Strip #	Setting	Delay	-	
		1	00	0	nS	
		2	00	0.4	nS	
		3	00	0.8	nS	
		4	00	1.2	ns	
	Steering					
	J	Points to:	тсс			
		φ =]		
		$\theta =$				
		T =				
	Power Sup	pply				
		Voltage:	15	VDC		
	T :					
	Timing:	Channel			1	
		Insorted Delay:		nç		
		AT to fiducial		<u>n</u> 9		
		Timed at	T-0 1	nS		
	Monitor O	Itnut	1 0.1	110	l	
						1
		Scope #	Channel #		Atten: db	

						F/.
#	5	Shots 6-11			2	T,
	Paylo	ad: XRF #4	Date:		1/20/00	
	•	Previous Shot #				
		Campaign	LANL Backlight	ter Deve	elopment	
	Optics:					
		Unimount Type	LLE Std.	+		
		Nosecone S/N	C			
		Dishala Size	0	N		
		Pinnole Size		μπ		
		Blast Shield	0.010 Be			
		Rear Filter Carrier S/N	12 um Eo			
		Film Back S/N	ι μπ Γσ	┥──┤		
		Pinhola Substrata	5 mil To LANI			
		Frame		╀──┤		
	Internal S	ettings:				
		Output 1 (Phosphor):		kV/	Bias ()	ffeat
		Output 2		V	Strip 1	
		Output 3 (Reverse Bias):	100	, v	Strip 2	
		Output 4 (PCD Bias):		V	Strip 3	
		Reverse Bias Range		V	Strip 4	
		PFN Type		ps	<u></u>	
	Interstrip	Timing:				
	•••••	Strip #	Setting	Delay		
		1	00	0	nS	
		2	00	0.4	nS	
		3	00	0.8	nS	
		4	00	1.2	nS	
	Steering					
	oteening	Points to:	тсс			
		φ =				
		θ =				
		T =				
	Power Su	pply				
		Voltage:	15	VDC		
	Timina:					
		Channel:				
		Inserted Delay:		nS		
		ΔT to fiducial	-	nS		
		Timed at	T-0.1	nS		
	Monitor O	utput	-	-		
		Scope #	Channel #		Atten: db	

OPS	TIM Setup) Sheet				V 2.0	10/7/00
					<u> </u>		
M #	5	Shot 12					
	Pavloa	ad: XRF #4	Date:		1/20/00		
		Previous Shot #			1/20/00		
		Campaign	LANL Backlight	ter Deve	elopment		
	Optics:		5		•		
	-	Unimount Type	LLE std.				
		Nosecone S/N					
		Magnification	6	Х			
		Pinhole Size	10	μm			
		Blast Shield	0.010" Be				
		Rear Filter Carrier S/N	any				
		Rear Filter	12 μm Τ Ι				
		Film Back S/N					
		Pinhole Substrate	2 mil Ta LANL				
		Frame	LLE std.				
	Internal Se	ettings:			-		4.
		Output 1 (Phosphor):		KV		Mas Offse	:
		Output 2 (Reverse Rise):	100	V		Strip 2	
		Output 3 (Reverse Blas).	100	V		$\frac{100 2}{10 3}$	
		Reverse Bias Range		V		Strip Λ	
		PEN Type		ns			
	Interstrin 1	Timina:		p3			
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		3		0.8	nS		
		4		1.2	nS		
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	Power Sup	pply					
		Voltage:	15	VDC			
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	Timing:	Channel					
		Inserted Delay:		ne			
		AT to fiducial		<u>ns</u>			
		Timed at	T_0 1	nS			
	Monitor O	utnut	1 ⁻ V. I	10			
		Scope #	Channel #		Atten: d	b	
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	Authorized	by G. Pien	Confirmed by:				

Film and Development

Diagnostic	Film	Format	Developer	Time	Temp
XRFC/SSC	TMAX	35mm	LLE	LLE*	LLE*
XRPHC	DEF	LLE	LLE	LLE*	LLE*
LAPC	DEF	2" diam	GBX	5 min	68 F
Henway	DEF	35mm	GBX	5 min	68 F

Film to be used at OMEGA 1-18/19-00

The LAPC and Henway will be ride-alongs on these two days for a few shots.

There will not be any 2484 run on Tuesday and Wednesday.

Diagnostic	Film	Format	Developer	Time	Temp
XRFC/SSC	2484	35mm	D19	7 min	75 F
XRPHC	DEF	LLE	LLE	LLE*	LLE*
LAPC	DEF	2" diam	GBX	5 min	68 F
Henway	DEF	35mm	GBX	5 min	68 F

Film to be used at OMEGA 1-20-00

2484 will be provided by LANL and will be wedged at LANL. 2" diameter DEF will also be provided by LANL.

*It is my understanding from a conversation with Eugene (1/10/00) that the standard LLE process for TMAX3200 is 24 deg C (75 deg F) for 7.5 min. The standard process for DEF at LLE is 20 deg C (68 deg F) for 5 min.

Although the standard LLE development for DEF is the same as I have specified for other DEF processes I am explicitly specifying these values so that there is no confusion.

Film personnel:

Eugene Kowaluk Stephanie Dent Steve Zipeto

Contact List of Key Personnel

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War Room -8360 WarRmComputers -7663 Ray Bahr -9443 Tom Boehly -0254 David Bradley - 5769 Paul Jaanamagi-5515 Jim Knauer -2074 Pat McKenty -3865 Sam Morse -9672 Greg Pien -5848 Wolf Seka -3815 John Soures -3866 Jean Steve -5286 Keith Thorp -7603

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