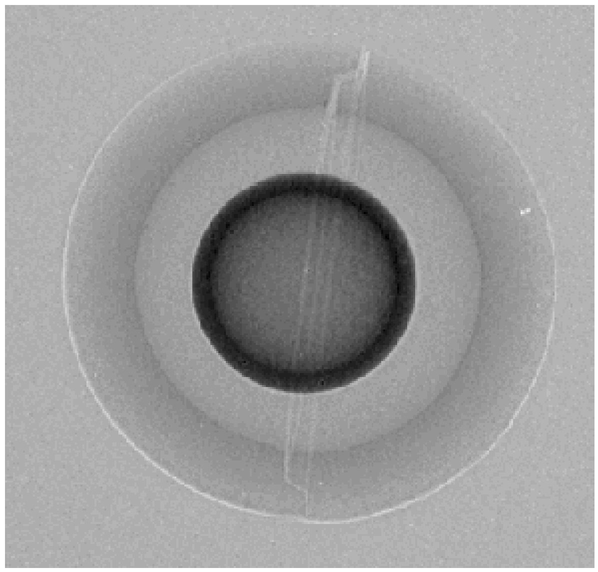
LA-UR-99-5744

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



Pre-Shot Report
Double Shells and ACE
LANL ID 00-1
October 25-29, 1999

Los Alamos
ICF and Radiation Physics

AWE
HUNTING-BRAE

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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 October 25-29, 1999 (ID 00-1)

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

Tuesday, October 26: Double Shell Implosions
PI: Bob Watt, (505)665-2310, watt_r@lanl.gov
PD: Bill Varnum, (505)667-2803, wsv@lanl.gov

Wednesday&Thursday, October 27-28: ACE Experiment
PI: Steve Caldwell, (505)667-2487, scaldwell@lanl.gov
PD: Glenn Magelssen, (505)667-6519, grm@lanl.gov

OMEGA will be configured for indirect drive (no phase plates, national lab blast shields) and the beams pointed for the tetrahedral hohlraum experiments of the double shell campaign. All diagnostics for the whole week can be set up and aligned, with unused diagnostics retracted for later use.

At the end of Tuesday, overnight 35 beams will be repointed. All but 5 will be repointed to TCC; the remaining 5 beams will need SG8 DPPs (for smooth, flat backlighter), repointing, and re-timing for the ACE experiment. Diagnostics should be ready for implementation immediately.

In this package are included:

- The experimental proposals for both campaigns, and
- A list of diagnostics for both campaigns.

Please note we should be able to use Target Positioning Procedure # TPS-ID8-7-99 for alignment of the double shell implosions. A mockup target will be used during Steve Caldwell's late September visit to create a Target Positioning Procedure for the ACE experiment.

DOUBLE SHELLS (Tuesday, October 26, 1999)

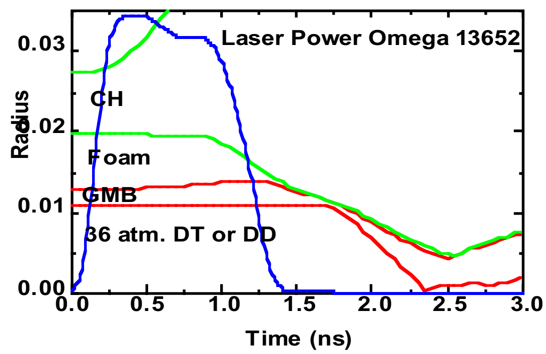
Goals for October Double-Shell Shots

- For October we plan on target comparisons between a “standard target” and a brominated target at identical convergences to eliminate performance differences due only to convergence. The CR will be 32.
- We will also repeat the GMB+CH inner shell target at 3 different convergences (27,32, and 37) to look for changes in symmetry and performance as the convergence increases. There is a tie-in with the standard and brominated targets at the convergence of 32.
- The above experiments should shed a great deal of light on whether M-band asymmetry is responsible for poor capsule performance at high convergence. This should be strong evidence, but one could still possibly argue that something else is responsible. The only other evidence that could provide further proof is to reduce the M-band asymmetry and/or magnitude by clever hohlraum design. We should perhaps try this for another round of experiments.
- The M-band issue really needs resolution, since it may also be responsible for poor performance of single shells, and ultimately for ignition designs.

HYADES Calculations

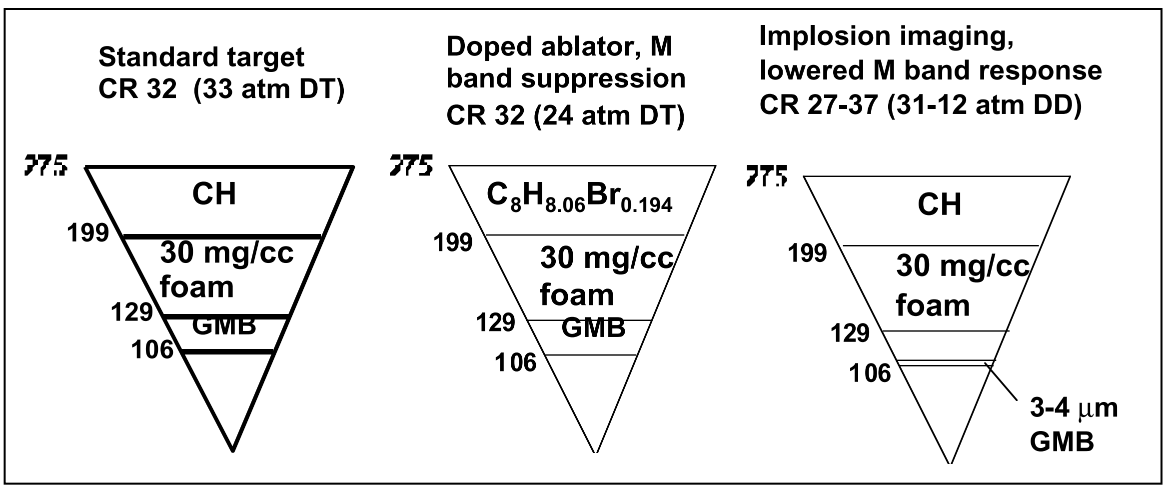
HYADES 1D calculations show some general implosion characteristics for the experiments

- Bangtime around 2.3 ns
- Ablator - GMB collision time ~1.3 ns, << bangtime
- Some decompression of the GMB due to M band x-ray penetration through the ablator
- Velocity multiplication of order 1.3
  - ratio of the maximum velocity of the peak density layer in the GMB to that in the ablator



This calculation is for the thick GMB+foam+CH ablator (standard) double shell used exclusively prior to March 1999

Target Design and Nomenclature



 Los Alamos

Experimental Proposal Template for Double Shells

- 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.

Double shell indirect drive implosions #3. R. G. Watt/W. S. Varnum, C. W. Barnes super-PI, Oct 26, 1999

- Summary of the experiment's objectives.

Verify and expand upon March 1999 results utilizing indirectly driven double shell implosions. In particular verify YOC near 1 using the "imaging double shell" target. Verify improvement, over historical behavior, of the "doped ablator double shell" target. Extend the imaging double shell data to include higher CR.

- Laser conditions required for the experiment:

    - Pulse shape - 1 ns square (SG1011)
    - SSD, DPP, and DPR conditions - March shots had the SSD driver but no DPP/DPR. Repeat that setup.
    - Power/energy balance - shot 15528 was 28 kJ on target but with 8.4% RMS spread. Reduced spread would be highly desirable. We would like 26 kJ/UV on target with 7% RMS for the imaging targets, and 28 kJ/UV on target with 8% RMS for other targets. (This translates approximately into all beams between 600 and 800 J/beam IR with a mean of about 690 J/beam IR for the imaging targets, and slightly hotter but with more spread for the other targets.)
    - Number of beamlines and target pointing summary requirements - 60 beams pointing as in July 1999 high convergence shots
    - Backlighting requirements and beam timing delays - no BL, no delays
    - Special laser conditions - none, best energy possible, best repeatability possible

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

Standard Omega neutron suite (NTD on DT shots, all scintillators (all shots), Cu activation on DT shots, Medusa [run on all shots, post-shot analysis may give Tion from first hit, possible rho-R if DD shots perform near clean for the doped ablator]), LANL BT detector, LANL QXI in TIM3 (LEH D) on all shots, CPS#2 on all imaging Double Shell (DD) shots (LEH A), GMXI (LEH B) on all shots, DANTE on all shots, all static PHC on all shots.

- 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.

A. Two LLE provided pointing spheres.
B. 12 LANL provided tetrahedral hohlraum driven double shell implosion targets (6 DT, 6 DD) in H1-H9-H11-H18 configuration identical to July 1999 ID campaign.

- Number of required laser shots.

Minimum 9, maximum 14, dependent on results and time.

- Special shot schedule considerations associated with experiment.

Tuesday, with hard cutoff at end of day for re-alignment to ACE experiment configuration (P6-P7 cylindrical halflraum).

Anticipated Shot Sequence

#	What	Calculated Yield	QXI timing
1	Pointing shot		T0-0.5 ns
2	Pointing shot (optional)		T0-0.5 ns
3	Br doped ablator (CR 32, 24 atm DT)	1.7E9	T0+0.5ns
4	Br doped ablator (CR 32, 24 atm DT)	1.7E9	T0+0.5ns
5	Br doped ablator (CR 32, 24 atm DT)	1.7E9	T0+0.5ns
6	Imaging Dshell (CR 27, 31 atm DD)	3.7E7	T0+2.3ns
7	Imaging Dshell (CR 27, 31 atm DD)	3.7E7	T0+2.3ns
8	Imaging Dshell (CR 32, 18 atm DD)	3.4E7	T0+2.3ns
9	Imaging Dshell (CR 32, 18 atm DD)	3.4E7	T0+2.3ns
10	Imaging Dshell (CR 37, 12 atm DD)	3.0E7	T0+2.3ns
11	Imaging Dshell (CR 37, 12 atm DD)	3.0E7	T0+2.3ns
12	Standard Dshell (CR 32, 33 atm DT)	1.0E10	T0+0.5ns
13	Standard Dshell (CR 32, 33 atm DT)	1.0E10	T0+0.5ns
14	Standard Dshell (CR 32, 33 atm DT)	1.0E10	T0+0.5ns

Diagnostic Build Sheets

Ω XOPS TIM Setup Sheet

V 2.0 10/7/00

TIM # 3 ***Shots 3-5, 12-14***

Payload: QXI **Date:** 10/26/99

Previous Shot # **15533**

Campaign **LANLID00-1 Double Shell**

Optics:

Unimount Type	**n/a**	
Nosecone S/N		
Magnification	**8**	X
Pinhole Size	**10**	µm
Blast Shield	**0.010" Be**	
Rear Filter Carrier S/N	**any**	
Rear Filter	**None**	
Film Back S/N		
Pinhole Substrate		
Frame	**n/a**	

Internal Settings:

Output 1 (Phosphor):	**2.5**	kV
Output 2	0	V
Output 3 (Reverse Bias):	**300**	
Output 4 (PCD Bias):	0	V
Reverse Bias Range	**500-950**	V
PFN Type	**200**	ps

Bias Offset:

Strip 1	
Strip 2	
Strip 3	
Strip 4	

Interstrip Timing:

Strip #	Setting	Delay
1	**00**	0 nS
2	**02**	0.2 nS
3	**04**	0.4 nS
4	**06**	0.6 nS

Steering

Points to:	**TCC**
ϕ =	29000
θ =	24470
T =	58,435

Power Supply

Voltage:	**15**	VDC

Timing:

Channel:	TBB 18/2	
Inserted Delay:		nS
ΔT to fiducial	27.92	nS
Timed at	T+0.5	nS

Monitor Output

Scope # TDS 684 GPIB 2	Channel #	3	Atten: -26 db

Authorized by G. Pien Confirmed by:

Ω XOPS TIM Setup Sheet

V 2.0 10/7/00

TIM # 3 Shots 6-11

Payload: QXI **Date:** 10/26/99

Previous Shot # **15566**

Campaign LANLID00-1 Double Shell

Optics:

Unimount Type	**n/a**	
Nosecone S/N		
Magnification	**12**	X
Pinhole Size	**7**	µm
Blast Shield	**0.020" Be**	
Rear Filter Carrier S/N	**any**	
Rear Filter	**None**	
Film Back S/N		
Pinhole Substrate		
Frame	**n/a**	

Internal Settings:

Output 1 (Phosphor):	**2.5**	kV
Output 2	0	V
Output 3 (Reverse Bias):	**100**	
Output 4 (PCD Bias):	0	V
Reverse Bias Range	**500-950**	V
PFN Type	**200**	ps

Bias Offset:

Strip 1	
Strip 2	
Strip 3	
Strip 4	

Interstrip Timing:

Strip #	Setting	Delay
1	**00**	0 nS
2	**02**	0.2 nS
3	**04**	0.4 nS
4	**06**	0.6 nS

Steering

Points to:	**TCC**
$\phi =$	29000
$\theta =$	24470
T =	58,435

Power Supply

Voltage:	**15**	VDC

Timing:

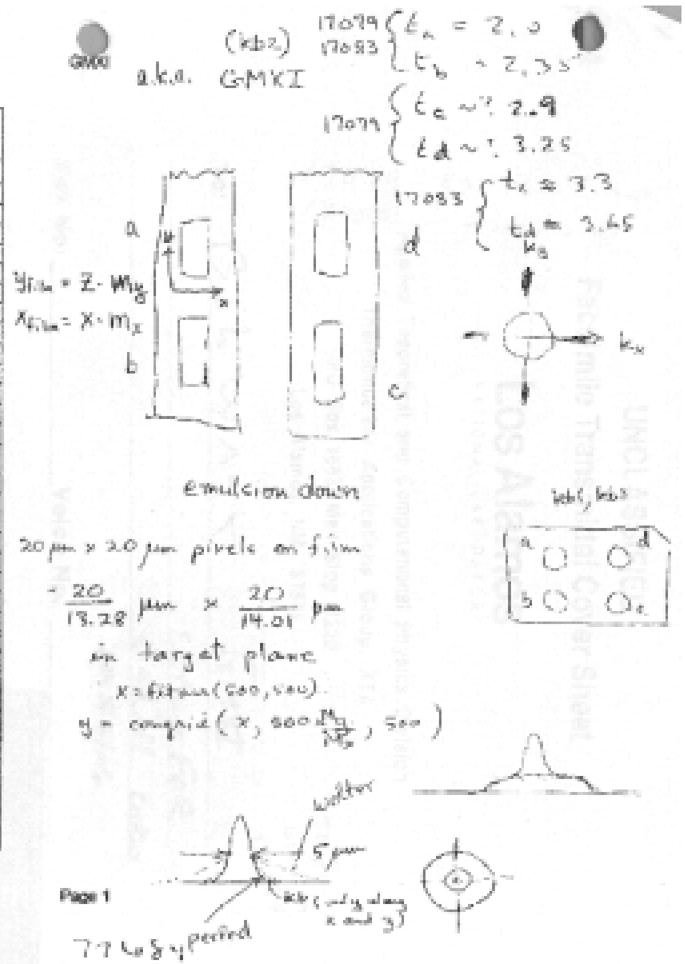
Channel:	TBB 18/2	
Inserted Delay:		nS
ΔT to fiducial	27.92	nS
Timed at	T+2.3	nS

Monitor Output

Scope # TDS 684 GPIB 2	Channel #	3	Atten: -26 db

Authorized by G. Pien Confirmed by:

OMEGA GMXI Setup Summary		
Fixed parameters		
Port location	H6	
Optic	Ir-coated #2	
Grazing angle	0.7 degrees	
Mirror thickness	9 mm	
Best resolution	5 microns	
Optic to target	180.5 mm	
Optic to image	2461.5 mm	
Magnification	x=13.28,y=14.01,ave=13.64	
Blast shield	4 mils Be	
Optic debris shield	0.5 mils Be	
Vacuum window	0.5 mils Be	
Solid angle	3.71e-7 sr	
Film	DEF/TMAX	
Changeable parameter(s)		
Crystal, side 1	WB4C	
angle	5.0 degrees	
Crystal, side 2	WB4C	
angle	5.0 degrees	
Filters		
image a	1 mil Be	
image b	1 mil Be	
image c	1 mil Be	
image d	1 mil Be	
Imagers		
side 1	DEF/TMAX	
side 2	DEF/TMAX	
Bias		
side 1	-200V	
side 2	-200V	
Delays		
Master	4669	
side 1	900./ ns	
side 2	900.0 ns	



Example Shot Request Form

Tuesday, October 19, 1999 LLE Data System/Shot Request Form Interface Page: 1

OMEGA Experiment Shot Request Form

RID#:6776

General Information

Series Name	Campaign	Planned Shot Date	Series Shot #:
LANL ID00-1 Double shell Imps	Other	10/26/99	3
		(Format: 3/18/99, 18-mar-99, etc)	

Principle Objective(s): Double shell implosions within tetrahedral hohlraums

Secondary Objective(s):

Yield: Type 6: No Yield or Low Yield, Neutron Yield predicted* to be less than 1e10

*Prediction is 1-D yield as predicted by target model, NOT the anticipated yield based on similar target performance.

Principal Investigators (Name/Phone/Pager)

PI 1	Watt/52011/
PI 2	Barnes//12-3598
PI 3	

Special Instructions

1ns SG1011 Max energy possible. Hold for PI pulse shape verification. Do not hold for film results. Calculated Yield 1.7e9, Anticipated Yield 3e8 DTN

Driver Information

Driver	Status	Pulse Shape	Leg	Timing Shift	SSD Modulation w/ X,Y coords
Backlighter	Off				
Ssd	Off				Off X: Y:
Main	On	SG1011			
Fiducial	On	Comb			

Target Information

	Target One Description	Target Two Description
ID(Model-Serial#):	Dshell_DT(capsule xx) - x	-
Type/Description:	24ATM DT	
Outside Diameter:	3004	
Shape:	Spherical	
Hazardous Materials:	Tritium	
Special Instructions:	2 gold bands on stalk	

Diagnostic Information

NOTICE: Important target chamber port update!

Primary Diagnostics: QXI/tim3/Au backlit capsule imaging; GMXI; NEUTRONICS NTD for burn history; Scintillators and Cu activiation for Y; Tion from first hit Medusa and Stoeckel Tion detector; Bang time from Omega and LANL BT detectors

Secondary Diagnostics: Dante; static Pinhole cameras; BS monitor BL25/30

http://omegawww.lle.rochester.edu/srfmgmt/

Beam Information

Total number of configured beams: 60

Beam #	Energy	Units	Pointing	DPR	DPP	Focusing	Timing	Termination
11, 13, 15, 17, 10, 22, 24, 28, 20-32, 37, 46, 56, 61	450	J/Beam (UV)	H1	No	No	hohlraum	nominal	target
12, 16, 19, 21, 23, 25, 27, 29, 34, 35, 38-30, 45, 64	450	J/Beam (UV)	H18	No	No	hohlraum	nominal	target
14, 18, 42, 44, 47, 53, 57-50, 62, 66-69	450	J/Beam (UV)	H11	No	No	hohlraum	nominal	target
26, 33, 36, 41, 43, 48-52, 54, 55, 63, 65, 60	450	J/Beam (UV)	H9	No	No	hohlruam	nominal	target

Back to General Information

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RID# 6776

Laser Beam Pointing Spreadsheet

0.02 **Tetrahedral Pointing Parameters**

Double Shell Implosions October 1999

(Static results for H1-H9-H11-H18)

config: 109

LEH	Port	Theta	Phi	unit hole vector -- kk z X	Y	Z	Sphere intercept 1400 µm from TCC X	Y	Z	LEH center 1355.544 µm from TCC X	Y	Z
A	1	37.377	18	0.577	0.188	0.795	808	263	1113	783	254	1077
B	9	79.188	234	-0.577	-0.795	0.188	-808	-1113	263	-783	-1077	254
C	11	100.812	126	-0.577	0.795	-0.188	-808	1113	-263	-783	1077	-254
D	18	142.623	342	0.577	-0.188	-0.795	808	-263	-1113	783	-254	-1077

7/9/1999 Try4

Cone	Angle	X	Y	Z
			R(LEH)	**350**
			kk offsets in µm	
1A	23.20	525	-45	256
1B	23.20	370	-50	700
2A	47.83	455	20	1035
2B	47.83	375	-170	1000
3	58.79	110	-50	1278
pent cone1	21.41			
pent cone2	42.02			

Sanity checks

R retro: 1356 RRRmax: 170.9574 1984.375 2381.25 3/16" BB 1984.375 2" BB

10/19/99 16:08

LEH	Cone	Beam	Beam Theta	Beam Phi	Focus wrt TCC X	Y	Z	Retro Dead Recon Offset XXX	YYY	ZZZ	Check Sphere theta	phi	ZZZZ focus	TCC to focus offset	LEH plane pointing offset
A	1A	31	42.0	342.0	41	562	159	51	-48	1197	38.8	8.1	-671	586	70
A	1A	22	21.4	54.0	562	-158	-49	-67	-20	1197	31.6	22.3	-671	586	70
A	1A	20	58.9	30.1	-160	-260	500	16	68	1197	42.4	23.8	-671	586	70
A	1B	17	21.4	342.0	610	366	351	6	-102	714	34.1	10.9	-674	793	102
A	1B	10	58.9	5.9	106	258	743	85	56	714	42.6	16.5	-674	793	102
A	1B	11	42.0	54.0	496	-230	575	-91	45	714	36.0	26.6	-674	793	102
A	2A	28	58.9	318.1	430	617	845	100	24	478	39.9	-6.0	-834	1131	103
A	2A	56	21.4	126.0	969	109	573	-29	-98	478	25.3	35.9	-834	1131	103
A	2A	32	81.2	41.5	394	-144	1050	-70	75	478	51.0	27.6	-834	1131	103
A	2B	46	21.4	270.0	880	313	545	-159	-64	530	26.8	-10.8	-786	1081	171
A	2B	37	81.2	354.5	299	458	933	134	-106	530	55.2	11.8	-786	1081	171
A	2B	13	58.9	77.9	553	-208	906	24	169	530	36.9	48.6	-786	1081	171
A	3_	61	21.4	198.0	836	219	949	-50	19	151	14.1	12.1	-898	1284	53
A	3_	24	81.2	66.5	685	149	1075	41	34	151	51.5	45.0	-898	1284	53
A	3_	15	81.2	329.459	692	351	1023	9	-53	151	53.4	-6.3	-898	1284	53
B	1A	41	81.2	257.5	-562	114	119	-51	48	1197	78.3	-119.7	-671	586	70
B	1A	63	98.8	221.5	160	-331	456	67	20	1197	85.0	-128.2	-671	586	70
B	1A	52	58.9	221.9	-41	-394	-432	-16	-68	1197	74.4	-130.1	-671	586	70
B	1B	49	98.8	246.5	-496	-411	463	-6	102	714	82.7	-122.0	-674	793	102
B	1B	48	58.9	246.1	-610	-478	-170	-85	-56	714	74.0	-124.9	-674	793	102
B	1B	60	81.2	210.5	-106	-780	101	91	-45	714	80.9	-131.1	-674	793	102
B	2A	36	81.2	282.541	-969	-561	158	-100	-24	478	79.6	-110.6	-834	1131	103
B	2A	51	121.1	210.1	-394	-875	598	29	98	478	92.3	-133.5	-834	1131	103
B	2A	55	42.0	198.0	-430	-1031	-174	70	-75	478	66.2	-134.2	-834	1131	103
B	2B	43	121.1	257.938	-553	-717	591	159	64	530	92.6	-113.4	-786	1081	171
B	2B	26	42.0	270.0	-880	-627	-36	-134	106	530	61.7	-120.3	-786	1081	171
B	2B	40	81.2	185.5	-299	-1039	7	-24	-169	530	84.0	-143.9	-786	1081	171
B	3_	54	138.0	234.0	-685	-1028	348	50	-19	151	102.5	-124.5	-898	1284	53
B	3_	65	58.9	174.1	-692	-1072	143	-41	-34	151	69.8	-148.3	-898	1284	53
B	3_	33	58.9	293.9	-836	-947	228	-9	53	151	67.2	-105.0	-898	1284	53
C	1A	57	121.1	138.1	-41	394	432	16	68	1197	105.6	130.1	-671	586	70
C	1A	67	98.8	102.5	-562	-114	-119	51	-48	1197	101.7	119.7	-671	586	70
C	1A	47	81.2	138.5	160	331	-456	-67	-20	1197	95.0	128.2	-671	586	70
C	1B	69	121.1	113.9	-610	478	170	85	56	714	106.0	124.9	-674	793	102
C	1B	53	98.8	149.5	-106	780	-101	-91	45	714	99.1	131.1	-674	793	102
C	1B	59	81.2	113.5	-496	411	-463	6	-102	714	97.3	122.0	-674	793	102
C	2A	62	138.0	162.0	-430	1031	174	-70	75	478	113.8	134.2	-834	1131	103
C	2A	18	98.8	77.5	-969	561	-158	100	24	478	100.4	110.6	-834	1131	103
C	2A	58	58.9	149.9	-394	875	-598	-29	-98	478	87.7	133.5	-834	1131	103
C	2B	50	138.0	90.0	-880	627	36	134	-106	530	118.3	120.3	-786	1081	171
C	2B	42	98.8	174.5	-299	1039	-7	24	169	530	96.0	143.9	-786	1081	171
C	2B	66	58.9	102.1	-553	717	-591	-159	-64	530	87.4	113.4	-786	1081	171
C	3_	14	121.1	66.1	-836	947	-228	9	-53	151	112.8	105.0	-898	1284	53
C	3_	68	42.0	126.0	-685	1028	-348	-50	19	151	77.5	124.5	-898	1284	53
C	3_	44	121.1	185.9	-692	1072	-143	41	34	151	110.2	148.3	-898	1284	53
D	1A	19	158.6	306.0	562	158	49	67	20	1197	148.4	-22.3	-671	586	70
D	1A	21	121.1	329.9	-160	260	-500	-16	-68	1197	137.6	-23.8	-671	586	70
D	1A	12	138.0	18.0	41	-562	-159	-51	48	1197	141.2	-8.1	-671	586	70
D	1B	29	138.0	306.0	496	230	-575	91	-45	714	144.0	-26.6	-674	793	102
D	1B	30	158.6	18.0	610	-366	-351	-6	102	714	145.9	-10.9	-674	793	102
D	1B	39	121.1	354.1	106	-258	-743	-85	-56	714	137.4	-16.5	-674	793	102
D	2A	64	158.6	234.0	969	-109	-573	29	98	478	154.7	-35.9	-834	1131	103
D	2A	16	98.8	318.5	394	144	-1050	70	-75	478	129.0	-27.6	-834	1131	103
D	2A	23	121.1	41.9	430	-617	-845	-100	-24	478	140.1	6.0	-834	1131	103
D	2B	38	121.1	282.1	553	208	-906	-24	-169	530	143.1	-48.6	-786	1081	171
D	2B	25	158.6	90.0	880	-313	-545	159	64	530	153.2	10.8	-786	1081	171
D	2B	35	98.8	5.5	299	-458	-933	-134	106	530	124.8	-11.8	-786	1081	171
D	3_	34	98.8	293.5	685	-149	-1075	-41	-34	151	128.5	-45.0	-898	1284	53
D	3_	27	98.8	30.5	692	-351	-1023	-9	53	151	126.6	6.3	-898	1284	53
D	3_	45	158.6	162.0	836	-219	-949	50	-19	151	165.9	-12.1	-898	1284	53

ACE Experiment (Wed.-Thurs., Oct. 27-28, 1999)

Experimental Proposal

ACE October 27 - 28, 1999
Principle Investigator: Steve Caldwell, LANL

The proposed 1-1/2 day experimental campaign consists of about 15 laser shots with two goals:

1) Characterization of a new single ended hohlraum (5 shots);
2) Development of a time resolved temperature diagnostic using an induced fluorescence technique (10 shots).

The laser beam requirements can be broken into 3 groups with each hohlraum being driven by either group 1 or group 2 and backlighting being provided by group 3. All beams are 1 ns square pulse shape with a nominal energy of 450 joules. The backlighter beams will use DPP/SG8 phase plates. The drive beams will not need phase plates. Beam requirements are contained in the attached tables.

Primary diagnostics are:

- Dante in H16
- SXRFC in P7/TIM6
- SSC1/AWE spectrometer in H7/TIM2

The SSC1/AWE spectrometer must be retracted when group 1 beams are used.
Permanently mounted pinhole cameras may be used as failure diagnostics.
ALL other system diagnostics must be cleared with Principle Investigator before use, including any optical views of target.

All targets are provided by LANL and all are aligned along the P6-P7 axis. The target inventory will consist of the following:

3 hohlraum characterization targets requiring group 1 beams;
3 hohlraum characterization targets requiring group 2 beams;
8 temperature diagnostic development targets requiring group 2 beams;
6 temperature diagnostic development targets requiring groups 2 & 3 beams.

Although the inventory consists of 20 targets, we expect to use only 15 laser shots.
Backup targets are provided in case of breakage or laser/diagnostic failure.

The ideal data set for the temperature diagnostic would require backlighter (group 3) delays of 2, 3, and 4 ns. Depending on data quality, we may request that the group 3 delays be changed, even at the cost of the total number of shots available.

The experiment will be done the week of October 25-29, 1999. It will be done on Wednesday and Thursday of that week, after the Dshell campaign of Watt & Varnum with 35 beams repointed overnight, 5 beams retimed, and diagnostics setup (they can be set up prior to Tuesday and remain retracted in TIM6 and TIM2 until needed).

Beam Requirements

Beam	Point to (r, θ, ϕ)	Focus Adjustment	Delay
group 1: 45,69,47,40,51 (42° cone), 64,25,50,67,59,58,65,60,63,54 (59° cone)	(0, 0, 0)	0	0
group 2: 17,20,35,16,33 (42° cone), 46,22,11,32,27,39,21,34,36,26 (59° cone)	(0, 0, 0)	0	0
group 3: 53,42,44,62,57 (21° cone)	(3000 μm,116.57°,162°)	0	3 ns

All beams 1 ns square pulse shape and 450 joules.

Groups 1 & 2 – no phase plates. Group 3 will use DPP/SG8 phase plates

Assumed procedure: Each beam is focused at the "Point to" position and then the focus is moved by the "Focus Adjustment" amount such that the final focus position is nearer the target chamber center.

Group 3 beams may be re-timed overnight depending on when the end-of-day break occurs.

Shot Schedule

Shot #	Target	P7	H7	H16	Beams
1	HCT/P6	SXFC	spect out	Dante	group 1
2	HCT/P7	SXFC		Dante	group 2
3	HCT/P6	SXFC	spect out	Dante	group1
4	HCT/P7	SXFC		Dante	group 2
5	HCT/P6	SXFC	spect out	Dante	group 1
6	AWET	SXFC?	AWE spect		groups 2 and 3
7	BHT	SXFC		Dante	group 2
8	AWET	SXFC?	AWE spect		groups 2 and 3
9	BHT	SXFC		Dante	group2
10	AWET	SXFC?	AWE spect		groups 2 and 3
11	BHT	SXFC		Dante	group 2
12	AWET	SXFC?	AWE spect		groups 2 and 3**
13	BHT	SXFC		Dante	group 2
14	AWET	SXFC?	AWE spect		groups 2 and 3**
15	BHT	SXFC		Dante	group 2

group 1: 45,69,47,40,51 (42° cone) and 64,25,50,67,59,58,65,60,63,54 (59° cone) 1ns sq

group 2: 17,20,35,16,33 (42° cone) and 46,22,11,32,27,39,21,34,36,26 (59° cone) 1ns sq

group 3: 53,42,44,62,57 (21° cone) 1 ns sq delayed 2, 3, or 4 ns

**group 4: 45,69,47,40,51 (42° cone) 1ns sq, delayed – could be used instead of group 3

Diagnostic Changes to SXRFC (XRFC4 in TIM6)

The primary diagnostic change from shot to shot during the ACE campaign is to translate the SXRFC along its Z axis (changing the radius of its object focus) and changing the interstrip timing and the t0 time. This table summarizes these changes for each shot:

SHOT	R (mm)	interstrip (ns)	t0 (ns)
1	0	0.5	0
2	2.8	0.5	0
3	0	1	0
4	2.8	1	0
5	0	?max	+10-max
6,8	3.1	0.2	2.6
7	0	1	0.9
9,11	2.8	1	0.9
10,12,14	3.1	0.2	see PI
13,15	2.8	0.5	0.4

Diagnostic Build Sheets

X-ray Streak Camera Configuration Request **Date** **10/14/99**

request # ________ For official use only

Date needed	10/27/99				
Requester	Steve Caldwell LANL				
Campaign	ACE				
Purpose of Diagnostic	AWE designed temperature diagnostic				
Streak Camera	**SSC1**				
TIM#	2				
Pointing	R=2800microns,Theta=116.57,Phi=162.00 (P7)				
Photocathode					
substrate		.5 mil Be			
material		CsI			________
fluffy		Y	available only for CsI and KBr		
fiducial		N	not available with 5000 µm slit		
slit width				1500 µm	
grid (1.5 mm spacing)	none	50 µm	75 µm		
Imager		N	fiducial not available with Imagers		
SMP					
other requirements	____				
Spectrometer	Y				
Preferred Spectrometer	AWE	LANL	provided		
Preferred Crystal					
Desired Range:	Min.	center	Max.		
	________	________	________	keV	
	________	________	________	Angstroms	
Blast Shield					
Material			________	________	________
Thickness			________	________	________
Filtering					
Material	Be				
Thickness	.001"				
Intensifier Gain	low				
Sweep Speed	5ns	full	sweep		
Timing wrt T0	3.5	ns	at	center	of sweep

X-ray Streak Camera Configuration Request (cont.) **Date** **10/14/99**

request # ________ For official use only

To be completed by assembler:

Photocathode installed	__/__/__	___:___	________			
comments	____					
Fiducial fiber installed	__/__/__	___:___	________			
comments	____					
Spectrometer complete	__/__/__	___:___	________			
spectrometer name	Ar	Xe	Cl	Al	LXS-1	LXS-2
crystal	RbAP	ADP	PET	Quartz	other:	________
expected range:	Min.	center	Max.			
	________	________	________	keV		
	________	________	________	Angstroms		
comments	____					
Imager complete	__/__/__	___:___	________			
comments	____					

Front end attached to streak camera with minimum of 3 screws? Y N

Fiducial fiber secured within limits of TIM boat? Y N

Sweep Speed set to: 1 2 3 4 5

Switches set? (electron optics on, bias on, intensifier on, gain set) Y N

Streak Camera delivered __/__/__ ___:___ ________

comments ____

Ω XOPS TIM Setup Sheet

V 2.0 10/7/00

TIM # 2 ***SHOTS: All***

Payload: SSC 1 AWE **Date:** 10/28-29/99

Previous Shot #

Campaign: **LANL ID00-1 ACE**

Optics:

Nosecone S/N	**Xe**	
Tune for		**Ti**
Blast Shield	0.009" Be	
Photocathode Assy. #		
Photocathode Type	**Au**	
Photocathode Slit	**200**	µm
Rear Filter Carrier S/N		
Rear Filter		

Internal Settings:

Sweep Speed Setting	**1**
Deflection Plates	**ON**
MCP Power	**ON**
Electron Optics Power	**ON**

Gain **High**

External Settings:

Steering
towards backlighter

	ϕ =	**162**
	θ =	**116.57**
	T =	**2.8mm**

Power Supply

Voltage:	**18** VDC

Timing:

Channel:	TBB 14/2	
Inserted Delay:		nS
ΔT to fiducial		30.3 nS
Timed at	T+3.5 at center	nS

Monitor Output

Scope # TDS 684 GPIB 2	Channel # 2
Input Attenuation:	-16

Authorized by G. Pien Confirmed by:

Ω XOPS TIM Setup Sheet

V 2.0 10/7/00

TIM # 6 shot 1

Payload: XRF #4

Date: 10/27/99

Previous Shot #

Campaign **LANL ACE**

Optics:

Unimount Type	**LLNL uniblock**	
Nosecone S/N		
Magnification	**3**	X
Pinhole Size	**25-10-25**	μm
Blast Shield	**none**	
Rear Filter Carrier S/N		
Rear Filter	**Py-Be-V**	
Film Back S/N		
Pinhole Substrate	LANL provided	
Frame		

Internal Settings:

Output 1 (Phosphor):	**2.5**	kV
Output 2	0	V
Output 3 (Reverse Bias):	**200**	V
Output 4 (PCD Bias):	0	V
Reverse Bias Range	**500-950**	V
PFN Type	**200**	ps

Bias Offset:

Strip 1	9
Strip 2	9
Strip 3	9
Strip 4	9

Interstrip Timing:

Strip #	Setting	Delay	
1	**00**	0 nS	varies
2	**00**	0.5 nS	
3	**00**	1 nS	
4	**00**	1.5 nS	

Steering

Points to: **along P7 axis to TCC**

φ =	162.00 deg	
θ =	116.57 deg	
R=	0.0mm	varies

Power Supply

Voltage:	**15**	VDC

Timing:

Channel:			
Inserted Delay:		nS	
ΔT to fiducial		nS	
Timed at	0	nS	varies

Monitor Output

scope#	Channel #	Atten:

Authorized by G. Pien Confirmed by:

Typical Shot Request Form

Monday, October 18, 1999 LLE Data System/Shot Request Form Interface Page: 1

OMEGA Experiment Shot Request Form

RID#:6751

General Information

Series Name	Campaign	Planned Shot Date	Series Shot #:
ACE	Other	10/27/99 (Format: 3/18/99, 18-mar-99, etc)	1

Principle Objective(s): Hohlraum characterization / P6

Secondary Objective(s):

Yield: *Prediction is 1-D yield as predicted by target model, NOT the anticipated yield based on similar target performance.

	Principal Investigators (Name/Phone/Pager)	Special Instructions
PI 1		
PI 2	Barnes//12-3598	Target is classified Film is classified
PI 3		

Driver Information

Driver	Status	Pulse Shape	Leg	Timing Shift	SSD Modulation w/ X,Y coords
Backlighter	Off				
Ssd	Off				Off X: Y:
Main	On	SG1011			
Fiducial	On	Comb			

Target Information

	Target One Description	Target Two Description
ID(Model-Serial#):	-	-
Type/Description:	HCT/P6	
Outside Diameter:	1800	
Shape:	Cylindrical	
Hazardous Materials:		
Special Instructions:	Target is classified to view	

Diagnostic Information
NOTICE: Important target chamber port update!

Primary Diagnostics: SXRFC (XRFC3) in TIM6 DANTE

Secondary Diagnostics: pinhole cameras

http://omegawww.lle.rochester.edu/srfmgmt/

Monday, October 18, 1999 LLE Data System/Shot Request Form Interface Page: 2

Beam Information

Total number of configured beams: 15

Beam #	Energy	Units	Pointing	DPR	DPP	Focusing	Timing	Termination
25, 45, 47, 40, 51, 54, 58-50, 63-65, 67, 69, 60	450	J/Beam (UV)	tcc	No	No	0	nominal	target

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RID# 6751

Diagnostic List for Week

	Campaign Segment		
TIM	Dshell standard or brominated (DT)	Dshell imaging (DD)	ACE
1 (Pent 3)			
2 (Hex 7)			**SSC1/AWE spectrometer**
3 (Hex 18)	**QXI 8X**	**QXI 12X**	
4 (Pent6)			
5 (Hex 14)			
6 (Pent7)			**SXRFC**
	DANTE (190 eV)	DANTE (190 eV)	**DANTE**
	LANL Bangtime	LANL Bangtime	
	Yield (scintillator)	**Yield (scintillator)**	
	Yield (Cu activation)		
	Medusa	Medusa	
	NTD		
		CPS #2 (H1)	
	GMXI (poly-chromatic; H9)	**GMXI (poly-chromatic; H9)**	
	pinhole cameras	pinhole cameras	pinhole cameras?
	Backscatter calorimetry	Backscatter calorimetry	

Contact List of Key Personnel

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??

David Hoarty (special)