LA-UR- 09-05879

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Title: PRAD0367 Magic Cone Detonator Test ~~Shot Report~~

Author(s): Alexander Saunders

Intended for: Archiving

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PRAD 0367

Magic Cone Detonator Test

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Cast of Characters

Shot number: 367
Magic Cone Detonator Test

Experimenter in Charge: Gary Grim
Principle Investigator: Mark Marr-Lyon
High Explosives Person in Charge: Mark Marr-Lyon
Firing Site Leader: Joe Bainbridge
Secondary FSL: Robert Lopez
Laser Person in Charge: N/A
Camera Point of Contact: Paul Nedrow
Analysis Lead: Alexander Saunders
Safety Watch: Eduardo Campos/Alexander Saunders
Data Acquisition System Point of Contact: Neil Thompson
Experimental Area Manager: Leo Bitteker

PRAD Core Team

Joe Bainbridge, Bethany Brooks, Eduardo Campos, Jose Dominguez, Camilo Espinoza, Jeremy Fait, Gary Grim, Gary Hogan, Brian Hollander, Nicholas King, Kris Kwiatkowski, Douglas Lewis, Julian Lopez, Robert Lopez, Luke Lovro, Fesseha Mariam, Mark Marr-Lyon, Wendy McNeil, Alfred Meidinger, Frank Merrill, Deborah Morley, Christopher Morris, Matthew Murray, Paul Nedrow, Paul Rightley, Alexander Saunders, Cynthia Schwartz, Amy Tainter, Terry N. Thompson, Dale Tupa, Joshua Tybo, Aleksandra Vidisheva

Experiment Team

Mark Marr-Lyon, Douglas Tasker, Von Whitley

LANSCE Approval Form
Explosives Operations in Area C

Starting Date of Activity: 18 June 2009
PRAD Proposal Number: NA – System Checkout
PRAD Shot Number: 367
HE Shot Plan Number: H3850 / LNSC-10557-DE3
Description: Det Test / Magic Cone

Vessel Experiment:
VAA approved vessel: Yes
HE ≤ 10-lbs TNT-equivalent: Yes

Powder Gun Experiment:
Propellant ≤ 350-g Class 1.3: NA

Dynamic MAR Experiment:
Requirements of ASE 3.5.2 met: ~~Yes~~ NA

Experiment Technical and Safety Review complete: Yes

PRAD EIC Authorization:

Signature _____ Date: 18 June 2009

Print Gary Grim

DE-3 HE PIC Authorization:

Signature _____ Date: 18 June 2009

Print PAUL RIGHTLEY

LANSCE Area B/C AM Authorization:

Signature _____ Date: 18 June 2009

Print Leo Bitteker

Shot Plan

WFO Shot Number:	LNSC-10557-DE3	**Release Date:**	6-17-09 KM		
Shot/Series Title:	Magic Cone	Originator's shot # (optional):	H3480		
Estimated Number of shots:	1	Past shot reference (optional):			
Lead Experimenter(s):	Mark Marr-Lyon	Group:	DE-3	Phone:	4-0841
Experiment Program Code/Cost Account:	J15P 0000 0000				
Firing Lead (s):	Joe Bainbridge	Group:	DE-3	Phone:	7-5495
Firing Site:	pRad	Owning Group:	DE-3	Phone:	7-3225
Max. Quantity HE per test:	3g				
Clearance Plan:	pRad				
Desired Test Date(s):	6/19/09				
IWD# and WPF# : Specify applicable document # (s) & expiration date(s) or note as NEW and in progress:	IWD: IWO-DE3-53-003-P100-0001 WPF: WASTE IS THE RESPONSIBILITY OF P-DIVISION AT PRAD				
Classified Shot: ☐ YES ☒ NO	If YES create classified shot addendum per classified document requirements				
☐ After Hours Contingency Plan	Required for shots executed after normal working hours. (defined as 4:30 PM)				

WFO Services Requested:	☐ RCT ☐ WMC ☐ Heavy Equipment ☒ Access Control	☐ IH ☐ Fire Department ☐ Fire Mitigation Review ☐ Environmental	☐ Other (Specify):

Brief Shot Description/Objectives: Attach sketches and drawings as necessary.
SE-1 + PBK-9501 pellet (½" ϕ × ½") fired into an Al cone.

High Explosive Operations Safety Officer (HE OSO): Shot Plan fire mitigation review. Provide comments as appropriate:
Shot Screened out

HE OSO approval for shot setup to proceed — Date: 6-17-09

Firing Site Leader (FSL): The FSL is the final authority on all operations of safety and procedure during firing site operations. The FSL ensures safety and technical aspects for executing the shots are complete.

FSL approval — Date: 6-17-09

Classification Review: (**IF REQUIRED BY TSM LEAD EXPERIMENTER,** refer to K. Jones e-mail of 5/2/05)

☒ Unclassified	☐ Restricted Data	**Authorized Derivative Classifier:**
☐ Confidential	☐ Formerly Restricted Data	Signature:
☐ Secret	☐ National Security Information	Name: Mark Marr-Lyon Date: 6/17/09
☐ Unclassified Controlled Nuclear Information (UCNI)		Title: TSM
		Derived From: N/A

Line Management (or Designee) Signature _____ **Date** 17 JUNE 2009

Firing Site Leader is responsible for keeping original record with Site records
WFO makes, distributes and keeps copy of completed form

CONTAINED SHOT REQUEST
Magic cone (File name: Magic_cone_17Jun2009.pdf)

DATE: 17 June, 2009

REQUESTOR: Mark Marr-Lyon, DE-3, 4-0841

LOCATION OF OPERATIONS: Area C/LANSCE/pRad

VESSEL TO BE USED
6 feet in diameter, 5 port, 2" thick walls (6-2-5-1)
Over-pressure Test: Shot H3841 was 6.83 kg TNT equivalent and had 0.25" windows
Visual inspection since last shot: No change
Date of last magnaflux: 24 March 2009 with no relevant indications.
Number of shots since last magnaflux: 1
HE Mass since last magnaflux: 6.0533 kg (13.3475 lbs)
TNT Equivalent since last magnaflux: 6.8342 kg (15.0695 lbs)

SHOT TO BE FIRED
Explosive: PBX-9501 (3 g), SE-1 detonator
Metal weight: 250 g Aluminum
Configuration: A ½" diameter x ½" long cylinder of PBX-9501 is placed at the top of a cone machined in a block of aluminum (see attached figure). The PBX-9501 is initiated with an SE-1 detonator. The radiography will be used to observe the enhanced damage produced at the bottom of the cone.

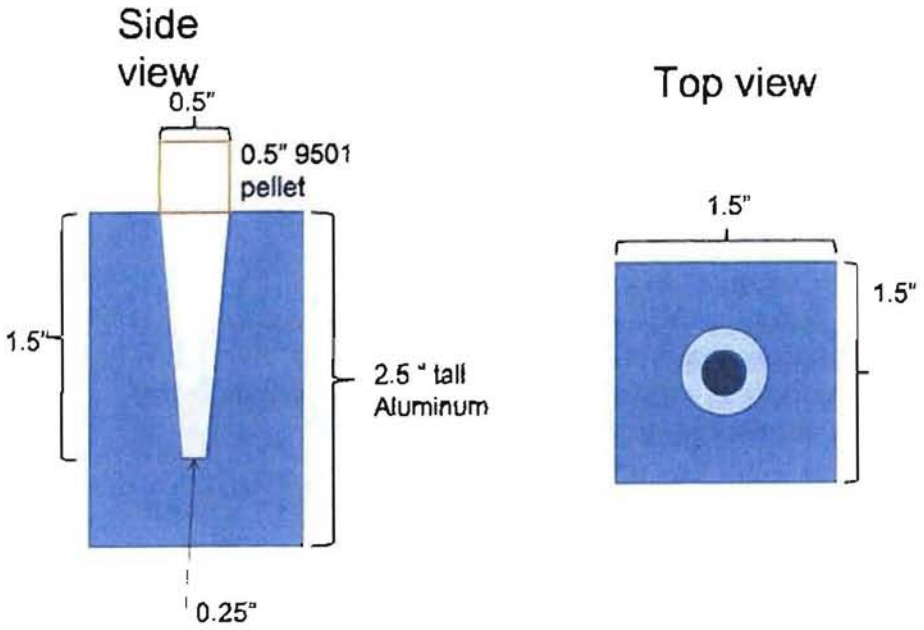
Fragment protection: No additional fragment protection will be used.

Beamline windows: 1/4" thick aluminum windows will be used on the beamlines.

PROOF TEST
Shot number(s): H3330-H3332, H3160-H3164, H3629-H3631
Results of proof: Many small shots similar to this one (e.g. Sandia Neutron Generators) have been fired successfully, as well as larger shots with similar configurations (e.g. Holtkamp shots and other plane wave lens driven shots).

REQUESTED SHOTS
Number of shots: 1
Shot numbers: H3850
Proposed shot dates: Before 6/23/2009

CONTAINED SHOT REQUEST CLASSIFICATION REVIEW
Classification Level: Unclassified
Authorized Derivative Classifier: Mark Marr-Lyon, DE-3


Side view
0.5"
0.5" 9501 pellet
1.5"
2.5 " tall Aluminum
0.25"
Top view
1.5"
1.5"

From: "Paul Rightley" <pright@lanl.gov>
Subject: **Contained shot request approval**
Date: June 19, 2009 11:33:55 AM MDT
To: mmarr@lanl.gov
Cc: dallman@lanl.gov, lbj@lanl.gov
Reply-To: pright@lanl.gov
1 Attachment, 110 KB

Mark,

As the delegated Vessel Approving Authority, I approve the firing of shot H3850 at pRad before 23 June 2009. I understand that the detonator to be used will be an RP-2 instead of the SE-1 stated in your request.

The HE load for this shot does not represent a risk regarding blast loading of the vessel. Also, the fragment distribution for such a shot is well understood from many previously fired, similar shots.

Paul CSR_magicc....pdf (110 KB)

Proton Radiography Experiment Safety and Security Review Checklist

PRAD shot number 367 Title Magic Cone Test

Review Date 6/16/09 Shot Date 6/15/09

Review must be performed within two weeks of shot date.

Table 1: Requirements of the Accelerator Safety Envelope (ASE): Require USI to violate or modify

Table 2: Requirements of the Safety Analysis Document: Require USI to violate or modify

Table 3: Requirements of LANL Safety Documents: Require Hazard Analysis and Management Approval to violate or modify

Table 4: Requirements of LANL Security documents: Require Management Approval to violate or modify

Brief Unclassified Description of experiment, including sample material, form, and quantity:

Detonator test with Al target. (billet)
1.5"x1.5"x 2" Al. 3g of 9501 + Se-1 detonator.

Required Facility Configuration (e.g. magnifier vs. –I lens; powder gun vs. 6-foot vessel):

~~Conf~~ Standard pRad; –I + 6' vessel.

Required Beam parameters (e.g. standard PRAD; video mode):

Standard pRad.

All SMEs participating in review: ~~Paul Rigl~~ None

Table 1a: Requirements of Accelerator Safety Envelope (ASE):

Number	Question	Yes	No	Requirements if YES	SME Inits.
1	ASE section 3.1.1.5 "Line X/B/C Beam Delivery Mode" will NOT be satisfied?		X	Outside of Safety Envelope: USI to proceed	
2	Outer vessel NOT qualified to greater than 150% of HE load in this shot?		X	Outside of Safety Envelope: USI to proceed	
3	Outer vessel NOT qualified for this shot by Vessel Approving Authority?		X	Outside of Safety Envelope: USI to proceed	
4	Total HE load greater than 10.0 lbs TNT equivalent?		X	Outside of Safety Envelope: USI to proceed	
5	Total propellant load in powder gun greater than 350 g Class 1.3 propellant?	N/A		Outside of Safety Envelope: USI to proceed	
6	Total Material at Risk (MAR) of greater than 12.0 Plutonium-Equivalent Grams (PEG)?		X	Outside of Safety Envelope: USI to proceed	

Table 1b: Additional requirements of ASE if MAR >= 0.1 PEG

Number	Question	Yes	No	Requirements if YES	SME Inits.
1	Total MAR in target assembly greater than 11.0 PEG?			Outside of Safety Envelope: USI to proceed	
2	Any MAR in non-metallic form, including powders?			Outside of Safety Envelope: USI to proceed	
3	Total HE in target assembly greater than 30 g?			Outside of Safety Envelope: USI to proceed	

Table 2: Requirements of Safety Analysis Document (SAD):

Number	Question	Yes	No	Requirements if YES	SME Inits.
1	New experiment configuration not covered by SAD?		✓	Outside of Safety Analysis: Hazard Analysis and USI to proceed	
2	Change to building design not consistent with SAD?		✓	Outside of Safety Analysis: Hazard Analysis and USI to proceed	
3	Explosives or detonators NOT approved by Laboratory Explosives Review Committee?		✓	Outside of Safety Analysis: Hazard Analysis and USI to proceed	
4	Firing circuits or firing circuit test equipment NOT approved by Explosives Instrument Review Committee?		✓	Outside of Safety Analysis: Hazard Analysis and USI to proceed	
5	Flammable gases would result in greater than 50% of flammability limit if released into vessel and backfilled with air?		✓	Outside of Safety Analysis: Hazard Analysis and USI to proceed	
6	Low voltage detonators on this shot?		✓	Outside of Safety Analysis: Hazard Analysis and USI to proceed	
7	No containment for this shot?		✓	Outside of Safety Analysis: Hazard Analysis and USI to proceed	
8	New hazards due to materials or equipment inside containment vessel?		✓	Review for new hazards	

Table 3: Requirements of LANL Safety Documents

Number	Question	Yes	No	Requirements if YES	SME Inits.
1	Shot contains more than 100 lbs of DU?		✓	Hazard analysis and management approval required	
2	Shot contains hazardous materials other than lead, silver, DU, or transuranics?		✓	Hazard analysis, management approval, and waste profile required	
3	This shot contains lead, silver, or DU materials?		✓	Hazard analysis, management approval, and waste profile required	
4	Lasers not covered by VISAR IWD required for this shot?		✓	LSO Review required	
5	Pins NOT approved by EIRC required?		✓	EIRC approval required	
6	Flammable gasses required in vessel?		✓	Hazard analysis and management approval required	
7	Will some HE NOT be burned after dynamic event?		✓	Hazard analysis and management approval required	
8	New chemicals required for this shot?		✓	Hazard analysis required	
9	Internal pressure vessel?		✓	Test pressure vessel to 110% for remote fill or 150% for manual fill	
10	Will hazardous waste be generated without an identified disposal path?		✓	Submit waste profile to Waste Coordinator before experiment	
11	Unlisted or uninspected electrical equipment?		✓	ESO review	
12	Will radioactive materials be produced that cannot be stored in radioactive materials cabinet in Area C?		✓	RP-1 review required	
13	Any work not covered by P25-IWD-07-42 (PRAD IWD) and IWD-DE3-53-003-P100-0001 (HE IWD)?		✓	Assess uncovered work and implement controls	

Table 4: Security Review

Number	Question	Yes	No	Requirements if YES	SME Inits.
1	Any special handling due to security concerns?		✓	DC Review; Activity Security Plan	
2	Has experiment NOT been DC or SAFE-7 reviewed?		✓	DC review	
3	Does experiment involve cleared or uncleared foreign nationals?		✓	Escort and computer use requirements	
4	Does this shot require overnight classified supervision?		✓	Arrange for overnight supervision	

Any new hazards or vulnerabilities not listed above? No

Summarize requirements from tables above, including new training requirements:

None.

Approval by Experiment Safety Review Committee

EIC _____ Date 6/16/09
Experimenter in Charge

HE PIC _____ Date 6/16/09
High Explosives Person in Charge

EAM _____ Date 16 June 2009
Experimental Area Manager

New review required if initial review is more than two weeks before activity:

Operational Guide and Safety Control Check List

The following is to be used as an operational guide and as a safety checklist to allow for recording of implementation of controls. This document is to be completed by the Experimenter In Charge or his designee. This document will be retained for 2 years after completed.

Shot Name: Magic Cone Test ; **PRAD #** 367 ; **HX #** LNSC-10557 ; **Originator's #** 3850

Dates of Shot: 6/19/2009 ; **Experimenter in Charge (PRAD PIC):** Grim

HE PIC: Marr-Lyon ; **Firing Leader:** ~~Lopez~~ Bainbridge ; **Secondary Operator:** ~~Bainbridge~~ Lopez

Checklist & Safety Watch Campos/Saunders ; **Laser Diagnostics PIC** N/A

Operational Guide	Safety Control Checklist	Initials	Date	Checked
Mark list for all N/A (Non/Applicable) items before EIC review. Classified shots; Call Richard Harford 5-0060 and Tim Olinger 5-6363 http://ptla.lanl.gov/cgi-bin/mailform/staff_form.htm	• EIC reviews/signs check list • PRAD safety/security review for this series within 2 weeks • Guards scheduled for night watching of classified shots	EL NA	6/22	✓ NA
Rope stays up until after shot has been completed.	• Rope off truck access entrance at north end of counting house. Label rope with "No Parking Fire Lane" sign	EL		✓
RWP = Radiation Work Permit – NOT expired Uranium, Pu, and other unusual materials/conditions	• RWP for dynamics – date is current & posted on shield door • RWP for extras (U/Pu) - date is current & posted on shield dr	NA NA		NA NA
1) HE Category (Orange Octagon) 2) Experimenter In Charge permission required for entry	• Signs: Line C tunnel entrance station (PACS) • Signs: Line C shield door, small door	EL		✓ ✓
Lightning Detector – Display NM. Full Zoom out - verify speaker volume	• Lightning computer speaker volume turned up & verified • LANSCE electric field mill displayed and indicating - Broken • Lightning Strike program displayed and updating	Broken Use N/A	access	Broken control N/A
	• CCR normal - EIC for the HE shot	EL		✓
Gun shots do not normally have a "confined space". NOT for DU/Pu!	• Confined Space Permit _____; effective	N/A		N/A
Respirators are required by the IWD.	• HE workers available with current confined space training • Respirators with canisters available – expiration date verified • Level II Anti-C clothing available (U/Pu) • (U/Pu) RCT available with respirator and canisters in date	✓ ✓ NA NA		✓ ✓ NA NA
Experiment Design - HE = High Explosive (Less than or equal to 10 pounds of HE or 300 grams of black powder)	• Depleted Uranium less than 100 pounds • HE load within Authorization Basis (10 lb HE or 300g powder)	NA		NA
	• HE on LANSCE Approved List	✓		✓
Some experiments do not use detonators, like electrically heated Cook-Off	• Detonators on approved list if required			
Some Powder gun shots require conductive surfaces for handling powder	• Conductive surfaces available if required by shot sheet or PIC	NA		NA
EIRC = Explosives Instrumentation Review Committee Power Supply, CDU, DCU, fiber optics trigger, etc.	• Firing Circuit & firing circuit test equipment, if used, have been reviewed by the EIRC for this specific use	✓		✓
	• Corresponding Proof/Overpressure Test Completed	✓		✓
Shot sheet specifies the approved HE load for this shot in this vessel/gun	• Vessel Approving Authority Approval Received	✓		✓

Operational Guide	Safety Control Checklist	Initials	Date	Checked
LANSCE = Los Alamos Neutron Science Facility	• Notification to LANSCE Experimental Area Manager	[illegible]		✓
Tested within past 30 days.	• Emergency Lighting in Line C dome	EC	6/17/09	✓
Portable gantry - Each structural member is attached by a removable pin. Not usually required for gun shots.	• Ask HX-3 if a Critical Lift Form will be needed later • A-frame crane – Official Daily Check – qualified operator	[illegible] [illegible]		✓ ✓
Braided grounding strap connects ground block on dome wall south side east.	• Electrical bonding connection to dome wall ground plate • Vessel or gun target box • Crane • [illegible] top assembly mount) or gun barrel	EC EC EC EC		✓ ✓ ✓ ✓
Module 9 – select "Normal" & push reset. Place "S1 test" switch in "test" and run unit for 10 minutes. Place "test" switch back into "normal". Check automatic transfer valve is not pointing to empty bottle. If the stand-by tank is not open, the generator will fail when #1 empties.	• Backup generator enabled – Module 9 "Normal" and "Reset" • Backup generator tested (not usually required for gun shots) • Propane automatic selection valve – NOT RED • Both propane tank valves OPEN • Work Stand light in dome hooked to generator and tested	EC EC EC EC EC		✓ ✓ ✓ ✓ ✓
CO = Carbon Monoxide – Zero ITX model after 15 minute warm-up. NOTE: Some CO monitors should not be ON when in their charger. NOTE: TV picture must be readable when dome lights are turned off. NOTE: The ITX models can be left on all day if no blower is installed.	• CO monitors – Two available and tested (includes zero reset) • Calibration within current • One installed in dome with a TV picture in the counting house. • Turn units off, including blowers, to preserve batteries	EC		✓ ✓ ✓ ✓
Turn amplifier power on and select "phono" Amplifier can be turned off after test.	• Microphone is placed on vessel or gun catch tank and audio can be heard in counting house.	EC		✓
GFCI – Ground Fault Circuit Interrupter – Use circuit tester w/trip button Not usually required for gun shots. Power cords on floor can be electrical hazards during flooding caused by a cooling hose rupture. Check 208 V crane and laser cords also.	• GFCI receptacles for vessel tested within 30 days • Vessel drop lights hooked to GFCI • Vessel extension cord for impact wrench hooked to GFCI • No 120V or 208V power cord connections on floor	EC EC EC EC	6/22/09	✓ ✓ ✓ ✓
House air line drives a venturi pump in the vertical run of the PVC exhaust pipe to the LANSCE radioactive exhaust stack system	• Vacuum pump exhaust booster pump hooked up and working • Radiation Portal Monitor – Green status & bottles have gas	EC EC		✓ ✓
	• Laser setup check list started – if lasers will be used	NA		NA
Uranium and Plutonium – Vacuum System Pressure after the shot is supposed to be less than atmospheric. First filter layer is 2.0 microns. Second layer is 0.2 microns. Check valve prevents U dust going out into dome during venting. Venting must be done slowly so as to not ignite U dust. TV picture in counting house for vacuum gage.	• U/Pu – Calculated post shot pressure is below atmospheric • Pump-down curve on containment & vacuum [illegible] 0.1 micron • Pump check valve installed on vent valve • Flow restrictor installed in vent line • Remote reading of post shot pressure in counting house • Valves operate OK – containment isolation, vent, purge • Remote reading of primary containment pressure in CCH	NA NA NA NA NA NA NA		NA NA NA NA NA NA NA
Uranium and Plutonium - Continuous Air Monitor	• CAM or Giraffe near vessel – Checked today by a RCT • Remote indication in counting house	NA NA		NA NA
Uranium and Plutonium – Contamination Control Areas	• Contamination area around vessel • Contamination area around HE assembly area • Contamination buffer area near portal monitor • Radioactive Materials Business area (safety posted – signage)	NA NA NA NA		NA NA NA NA

Operational Guide	Safety Control Checklist	Initials	Date	Checked
Gas cooling/heating system could overpressure vacuum pumping system; so, a "conflat" blank is placed on a tee by the pressure gage. The LN2 dewar connections are easily confused – check the correctness.	• Gas filled, cooled, or heated shots • Zero pressure relief installed for upstream vacuum valve • LN2 dewar inlet & outlet connections double checked	 NA NA	 * *	 NA NA
Vacuum pump exhaust system to radioactive exhaust system – white PVC piping system – Big gray valves (usually without their red handles)	• Vacuum fore pump exhaust valve open – Upstream of vessel • Downstream of vessel • Second Lens system	 EL		✓ ✓ ✓
Both gage controllers in blue racks	• Vacuum gauge TV picture in CCH with separate illumination	EL		✓
Remove dust/gases falling out of front door	• Portable HEPA system rigged/tested under vessel front door	EL		✓
The type and thickness required is specified in the "Contained Shot Request Form" under "Shrapnel Protection". Windows must be checked for damage from previous shot every time, including checking the glass for cracks.	• Containment system beam windows • Glass thickness required 0 inch downstream 0 • Metal type Al thickness 1/4" dwnStr 1/4" • Upstream checked for damage after previous shot and installed • Downstream checked for damage and installed	 EL EL		 ✓ ✓
Key & reset at IL0; Power ON = green LEDs on controllers in blue racks	• Dalek - Key IN, Reset, and power ON	EL	*	✓
Beam Line vacuum pump-out valve – The containment system isolation valves to the pumping stations. Tested from CCH. CCH = Line C Counting House TV picture requires separate illumination to be seen when the dome lights are out.	• Containment isolation vacuum valve actuator operation • Upstream of vessel • Downstream of vessel • TV pictures can be viewed in CCH • Illuminators available (flashlight or equivalent) • Vacuum valves OPEN	 EL EL EL EL EL	 * * *	 ✓ ✓ ✓ ✓ ✓
No bolts can be left out. Broken bolts must be reported to the HE PIC and EIC. Not required after the first shot in a series.	• Vessel/gun and containment pipes installed and checked for loose and missing bolts – every bolt installed and tight	EL		✓
Door check for is for the doors installed at this time, like beam line doors.	• Vessel/gun installed doors checked for loose/missing bolts	EL		✓
	• Beam Line Setup entered into DAQ program	EL		✓
Exclusion Threshold Temperature is the temperature above which the HE might be unstable; so, people are excluded. LANSCE requires all Lock Out Tag Outs to be entered into their log. Thermocouple Meter or DVM with temperature scale	• Cook-Offs: • Shutter illumination available • TV picture of laser blocking shutter in counting house • Four lock boxes & padlocks available • Laser shutter tested – beam safe (closed) upon loss of power • Beam cables locked by PL in CCH and PL has the key(s) • Hooked thru – Portable thermocouple meter available and tested	 NA NA NA NA NA NA	 * 	 NA NA NA NA NA NA
	• Exclusion Threshold Temperature _____ • Temperature readout working in counting house	NA NA	*	NA NA
CDU = Capacitive Discharge Unit	• Firing Leader in direct charge of HV connection box key and charging key for "DU" Power Supply • Cook-Off laser shutter power locked off and PL has the key • Secondary operator has trigger key	EL NA EL		✓ NA ✓
For ribbon cables, to support "slappers", this test is performed off site.	• High Pot testing of vessel feed-throughs completed	EL	*	✓

Operational Guide	Safety Control Checklist	Initials	Date	Checked
DCO – Detonator Checking Ohmmeter	• DCO available, if needed – Charged up or charging	EC	*	✓
Signature in CCR (Central Control Room) for today's shot	• LANSCE Experimental Area C Manager Approval Received	EC	6/22	✓
Firing Site Access Control 7-6742	• Access Control – weather status – run a Weather Watch	EC		✓
	• HE starting transport to TA-53 at time = 1028	1028 (uf)	*	✓
HE staff and P-25 have agreed that asking CCR to not open the line B tunnel door is sufficient control to prevent violation of the HE exclusion area. The EIC knows that the authorization basis requires firing leader approval before permitting line B entries. CCR line-by-line for Line B PACS = LBSS1L1 and/or 1L2 NTOF door – Exclusion Area – Red light ON and door Locked (pull on it)	• Notify CCR – LCR high explosives are being dropped in TA-53. Please do not allow entries into the line B and C tunnels without the permission of the Experimenter in Charge until after HE operations are completed • Line B tunnel PAC Secured • NTOF cave 202 key exclusion area secured	(uf) EC EC		✓ ✓ ✓
Orange Octagon with a "1" on it.	• Post large sign outside truck roll-up door – HE Category	EC		✓
Post 2 signs - HE Orange Octagon & EIC – **after** HE is on its way. HE octagon clips onto exclusion area box over top of keyed lock.	• EIC Sign for Line B tunnel – NTOF maze outside door • HE octagon – NTOF Exclusion area box	EC EC		✓ ✓
The experimenter in charge will notify CCR when the HE arrives on site.	• HE arrival time: 1057 • CCR Notified that the HE has arrived	EC		✓

******* Move HE into Line C Dome **********	Move HE to Dome * recheck all items for multiple shots		*	
Laminated Badge "I am guarding classified (SRD) High Explosives"	• Bomb Badge issued	NA		NA
LANL Meteorologist substitutes for broken lightning/field indications Moving the HE out of the delivery truck begins HE operations at TA-53	• Lightning/weather status – Access Control or Meteorologist • Notify Access Control that HE is being removed from truck	EC EC	*	✓ ✓
A custom terminator is placed on the end of the cable.	• CDU output detonator cable is terminated – not open ended	EC		✓
	• Pathway for HE movement cleared of obstructions and HE area is free of combustibles.	EC		✓
	• HE moved into Line C dome inside D.O.T. Container	EC	*	✓
Door cannot be re-opened until after shot fired or returned to DOT container – AC20 page 83 Explosives Operations at LANSCE	• Area C shield door closed and air pads deflated before opening HE shipping container	EC	*	✓
	• Firing Leader holds keys: • Dome access keys (PACS) • VISAR control box • PDV Laser key • Cook OFF laser control key OR laser ignition fiber lock box	 EC NA NA NA	 * * * *	 ✓ NA NA NA

HCP = Hazard Control Plan
IWD = Integrated Work Document
EIC = Experimenter In Charge
VISAR – Laser system
Velocity Interferometer System for Any Reflective surface
Uranium, Beryllium, Lead, etc. all require additional training and may require a special IWD
PIC = Person in Charge – must be consulted about work which comes under their responsibility before the work starts, as per the IWD.

Only one briefing per day is required if all the days shots are discussed at the first briefing and if there are no significant changes from shot to shot.

HE heated above its Exclusion Threshold Temperature may go off without warning.

• Pre-Job Briefing by EIC			
• Has anyone NOT read and signed the PRAD security plan?			NA
• Dynamic ICWP			NA
• Area C hazard overview			✓
• Dynamic IWD* →	------→	------→	✓
• Special IWD and/or training (U, Be, * u, Pb, etc.)			NA
• Does anyone NOT have current TA-55 site specific training?			
• Experimenter In Charge is →			✓
• No dome PACS entries after HE load without EIC approval	------→	------→	✓
• HE PIC is			✓
• Firing Leader is			✓
• Secondary firing leader is Lopez →	------→	------→	
• Ignition sources prohibited in dome – no lighter, no matches			
• Absolutely no entries after HE exceeds exclusion temperature			NA
• Safety Watch is Eddie →	------→	------→	
• Forklift operations are halted in the dome and truck entrance			
• Laser Diagnostics PIC is →	------→	------→	N/A
• VISAR/LASER system status is …			NA
• Laser Keys – Clarify the times when FL needs to hold keys			NA
• MSDS sheets available via counting house computers -------→	------→	------→	✓
• Flammable gases in detectors, cameras, and vessel? No			✓
• Are there any other issues?			✓
•			
•			
•			
•			
•			

******* Load HE into Vessel **********	Loading HE * recheck all items for multiple shots		*	✓
	• Crane - Critical Lift form completed	NA	*	NA
	• Laser setup check list completed	NA		NA
U/Pu containment system not opened until after venturi pump disconnect. No air flow through containment system for U/Pu.	• U/Pu Vacuum system venturi pump disconnected before opening • LAM & CAM exhaust pump turned on and verified by a RC 1	NA NA	*	NA NA
Cook-off laser ignition fiber locked after fiber is through the vessel door.	• Cook-off laser ignition fiber locked in box and FL has key	NA	*	NA
HE procedures limit the number of persons in the area to 5. Access Control or Meteorologist if local indications broken.	• Assign a door watch for HE exclusion area and to watch the lightning detector - reports to firing leader	EC	*	✓
No one is in the dome without the firing leader's approval.	• HE Exclusion Area established	EC	*	✓
Door watch asks each new person if they have ignition sources.	• HE team has NO ignition sources - no matches, no lighters	EC		✓
Team going in is in radio contact with a person outside.	• Radio Check – door watch to access control • Radio Check – entry team - door watch from inside shield door	EC EC	* *	✓ ✓
epending on the meter, the DCU check is done before or after the vessel is secured. The detonator cable is protected from sparks.	• Detonator Checking Ohmmeter - check completed • Shorting cap on detonator cable connector	EC EC		✓ ✓
U/Pu - venturi pump air line was previously disconnected.	• U/Pu Vacuum system venturi pump ReConnected	NA		NA
Blast containment system All bolts must be installed. No broken or missing bolts. All bolts must be re-checked for tightness after the system is under vacuum.	• Vacuum less than 25 torr and Vessel is secured (fully bolted down) (<25 torr - 25mm Hg - 25,000 microns) • Beam line bolts are all installed and tight (after vacuum) • Vessel door bolts are all installed and tight (after vacuum) • Gun breech - all holes plugged (pressure transducer)	EC EC EC NA		✓ ✓ ✓ NA
Vessel and/or containment system leak too much for good pictures? 5 min DO NOT Exceed 25 Torr! HE exclusion area required for >25 torr!	• Leak check - Vessel pressure start .4 Finish .24 DO NOT Exceed 25 Torr! Time start _____ Finish_____	EC	*	✓
Gas cooled/heated shots only – "zero pressure relief valve"	• Pop-off valve clamp ring OFF prior to gas cooling/heating shot	NA	*	NA
U/Pu - The inner chamber is the "Thermos" or other containment vessel holding Pu, U, Be, etc. The "Vessel" is the containment vessel attached to the beam line (6' or 4' vessel).	• 15 minute vacuum check - 1 Torr change - lost blast valve • Inner chamber pressure start _____ finish _____ • Vessel chamber pressure start _____ finish _____	NA NA NA		NA NA NA
Minimize radiation damage to CAM electronics during beam tuning.	• CAM OFF	NA	*	NA
Cook-offs - First testing of thermocouples and electric heaters. PACS must be secured for heater test. HX takes credit for PACS.	• Two thermocouples reading OK in counting house • Heater Cables still locked up in counting house • Laser blocking shutter (CLOSED) and laser ignition fiber locked • Cook Off heater test - Permission to hookup - HE PIC, EIC • HE exclusion area is established • Heater cables hooked up by FL in dome • Line C dome PACS secured • Permission to unlock & perform heater test - EIC, FL, HE PIC • Thermocouples tested by reading temperature > degrees • Heater cables locked by PL in CCH and FL has the key	NA NA NA NA NA NA NA NA NA NA NA	* *	NA NA NA NA NA NA NA NA NA NA NA
IL = Image location Thin vacuum windows have protective covers to guard against blowouts when the beam line is under vacuum.	• Remove vacuum window covers • IL0 upstream • IL1 downstream • IL2 upstream and downstream	 EC	 * * *	 ✓ ✓ ✓

Go back inside vessel/target box with HE inside	Vessel Re-entry * recheck all items for multiple entries		*	
CDU may have been fired into a short to test timing signal synchronization	• Detonator high Voltage cables are **AGAIN** connected to grounding block on CDU power supply rack	_____	*	_____
	• Cook off heaters locked off in CCH and the FL inc. the keyes	NA		NA
	• EIC permission	_____	*	_____
	• Firing Leader & HE PIC permissions	_____	*	_____
	• Weather check with access control	_____	*	_____
	• HX-3 Radio checks with access control and entry team	_____	*	_____
	• FL has keyes (CDU lasers) (cook off keys, shutter&heaters)			
	• Door & weather watch assigned			
	• HE team has NO sensitive similar: no matches, no lighters			
	• HE backstop Area established			
Inside dome	• U/Pu Vacuum system venturi disconnected before opening	NA	*	NA
	• CAM & CAM exhaust pump turned on and verified by a RCT	NA	*	NA
	• Cooling/heating system shut off – if required by firing leader	__NA	*	__NA
	• Laser blocking shutter CLOSED and laser ignition fiber locked	NA		NA
	• Detonator cables disconnected from CDU & shorted	_____	*	_____
Exiting dome	• U/Pu Vacuum system venturi RC connected	NA	*	NA
	• Vacuum less than 25 torr and Vessel is secured (fully bolted steel doors) (25 torr 30mm-Hg 25,000 microns)			
	• Vessel door bolts are all installed and tight (after vacuum)			
	• Line breach all holes plugged (pressure transducer)	NA		NA
	• Detonator (backing) filaments – check completed			
	• Shorting cap on detonator cable connector			
	• Leak check - Vessel pressure start _____ finish _____	_____		_____
	• U/Pu - CAM OFF	__NA	*	__NA
	• Chamber double vessel check 1 Torr change close valve	NA	*	NA
	• Inner chamber pressure start finish	NA		NA
	• Vessel chamber pressure start finish	NA		NA
	• Cooling/heating system turn ON if required	__NA	*	__NA

FINAL ENTRY before FINAL SWEEP	Final Entry * recheck all items for multiple shots		*	✓
Verify Pins signal path has been checked	• Pins operation verified	NA	*	NA
CDU may have been fired into a short to test timing signal synchronization	• Detonator high Voltage cables are **AGAIN** connected to grounding block on CDU power supply rack	EC	*	✓
	• Cook off laser shutter power locked off by PL and PL has key	NA	*	NA
Radio operator stays outside the shield door	• Weather check with access control	EC	*	✓
Needed for initial re-entry	• CO monitor located outside the dome (second unit)	EC	*	✓
	• Vacuum gauge unit [illegible] on channel 6 • Vacuum gauge unit [illegible] on channel [illegible]	EC EC	*	✓ ✓
Carbon Monoxide detector – Call the line C counting house to verify picture of Co monitor before exiting dome.	• CO monitor in Line C dome turned ON with picture in CCR • Illumination turned on for CO monitor • Illumination turned on for vacuum Gauge • Illumination turned on for vacuum Valve	 EC	 * *	✓ ✓ ✓ ✓
Uranium and Plutonium U/Pu - Venturi pump air line was previously disconnected. CAM - Continuous Air Monitor	• U/Pu - Vacuum gauge venturi pump connected and working • CAM turned ON and working verified by a RCT • CAM exhaust pump turned ON	NA NA NA		NA NA NA
Usually for gun shots	• Turn on PIN power supply in Dome if required	N/A	*	NA
Post shot classified traces not visible to L-cleared RCT or operator	• Classified O-scopes are covered or displays disconnected	NA	*	NA
Amplifier power ON; select "phono".	• Microphone audio ON and in PHONO	EC	*	✓
Tap on vessel with metallic object.	• Microphone audio tested again	EC		✓
Note that the sign at the line B tunnel door is a long way away; so, this step is done in parallel with the final sweep with detonator hook-up. With UCN exclusion area, this is now the NTOF maze entrance door.	• Post sign "Special Re-Entry Procedure In Effect" • Line C key bank • Line B tunnel entrance door (NTOF maze door)	 EC EC		✓ ✓
FINAL SWEEP before Firing	**Final Sweep**		*	✓
	• BIC AND HE PIC give permission to hook up shot for firing	EC		✓
	• Cook off laser shutter power locked off by PL and PL has key • Heater cables locked by PL in CCR and PL has the key(s) • TV picture in counting house or control wires disconnected	NA NA NA		NA NA NA
HE operation - Team going in is in radio contact with a person outside. Lightning/ field level – local indication, Access Control, or Meteorologist	• Door/weather watch assigned • Weather/Lightning status ok	EC EC		✓ ✓
The detonator conductivity is usually checked again before hookup	• DCO meter	EC	*	✓
Team going in is in radio contact with a person outside	• Radio Check – door watch to access control • Radio Check – entry team - door watch from inside shield door	EC EC	* *	✓ ✓
Health Physics Technician, Central Control Room Operator, Firing Leader, and Firing Team Members as needed by the Firing Leader. The gun catch tank and target chamber may have vacuum valves. Gas cavity fill is different from gas target fill valve – different shot types.	• Detonator(s) connected to firing circuit or fiber to laser • DCO check completed • Gas cavity fill valve OPEN • Target/shot gas fill valve or bypass valve - CLOSED • Gun catch tank/target vac valve - from closed, if applicable	EC EC NA NA NA	* * *	✓ ✓ NA NA NA
Lights are turned out for beam pictures. A containment system breach can release large quantities of CO.	• Lights OUT – dome • Notify CCR - Line C Cave is ready for Firing. Special re-entry procedure is in effect due to possible carbon monoxide	EC EC	*	✓

HE heated above its exclusion temperature may go off without warning.	• Cook offs - EIC and HE PIC and FL agree to start heating HE • Laser trigger OK • Laser blocking shutter enabled inside dome • Permission by EIC and FL to exceed ex. fusion temperature	NA NA NA NA	 * *	NA NA NA NA
U/Pu - Room 53-3-S207, Motor Control Center T14G – HVA-1 and FE-1	• U/Pu - Lock fans OFF - Lock C dome supply and exhaust fans	NA		NA
FIRING	**FIRING**		*	✓
Gun and vessel shots are fundamentally different when requesting beam	• LXP timing check – verify gate relationship to shot need	EC	*	✓
DG-535 on top of firing rack. Same one used for firing detonators.	• Cook-off laser - gate generator in external trigger mode	NA	*	NA
Powder gun projectile detection pin(s) are jumpered for pre-shot testing.	• Gun shots – Disconnect short from Beam Request Pin	NA	*	NA
Lights may have been turned on to watch something.	• Lights OUT – dome – again check	EC	*	✓
Some vessel shot have a gas cavity with two valves. The manual isolation valve is opened during final entry and the remotely operated valve is opened for the gas fill and then closed again before firing. Some vessel shots use timing pins powered from the counting house.	• Gas Fill valve OPEN • Gas fill pressure equalized • Gas fill valve CLOSED • PINS power supply ON, in counting house, if applicable	NA NA NA NA	* * * *	NA NA NA NA
	• VISAR ready, if applicable • PDV ready, if applicable	NA NA	* *	NA NA
Shift data taking mode from statics to dynamics. If in classified mode, camera computers are mode switched separately. If line X is lined up to the 1X or 2X beam stops, beam will not go to LC.	• DAQ in "Dynamic Mode" • Classified Camera computers in "Dynamic Mode" • CCR – "Is the line X beam lined up to send beam to line C?"	EC NA EC	* * *	✓ NA ✓
"Status" display from CCR is checked by EIC – right hand dash is green	• H- injector is ready and enabled to send beam – rt. green dash	EC	*	✓
Usually for cook offs.	• Movie Mode – Cameras in Movie Mode • Stand alone mode • 999 Frames • Acquire mode	NA NA NA NA	* * * *	NA NA NA NA
The radiation safety system MUST be secured for HX to fire. Absolutely no talking by anyone, except as required by the EIC	• PACS secured • Announcement: Attention! Final firing sequence. Absolutely, NO unnecessary TALKING!	EC EC		✓
Beam Line vacuum pump-out valves – Valves from pumping station to beam pipe.	• Close beam line vacuum pump-out valve remotely - upstream • Close beam line vacuum pump-out valve remotely - downstream	EC EC		✓ ✓
CDU – Capacitive Discharge Unit – This energy storage box, located next to the HE, fires the detonator. DG-535 MUST be in external trigger mode before shutter is opened.	• EIC gives permission to charge CDU OR open laser blocking shutter AFTER gate trigger - external • CDU charged or laser shutter open	EC EC	 *	✓ ✓
	• CCR – "Is beam available?" If yes, "CCR, standby for firing!"	EC	*	✓
	• Cook offs – Start DAQ run WITHOUT arming cameras • Beam ON in continuous mode (like 2 or 3 Hz)	NA NA	* *	NA NA
	• EIC gives permission to Arm system • Cameras ready • CDU trigger key enabled • PDV ready	EC	 * * 06/22	✓ ✓ ✓ NA
	• EIC called for beam or triggered laser at 1600 hours	EC	~~1600~~	✓

Post Shot	After Firing		*	
	• CDU discharged - high Voltage meter indicates zero	EC		✓
Detonator high Voltage cables are **AGAIN** connected to grounding block on CDU power supply rack	• Detonator High Voltage cables connected to grounding block • Pin Power Supply OFF (in counting house)	EC NA	* *	✓ NA
	• CDU keys removed or cook off laser blinking shutter closed	EC		✓
Beam line upstream of containment system. Unit 1 channel 6.	• Post shot beam line pressure 5 torr	EC		✓
TV picture of CO monitor	• Line C CO before initial re-entry 0 ppm CO	EC		✓
Firing Leader determines the apparent shot status after evaluating the microphone audio, vacuum, and camera pictures.	• Apparent status: • Successful • Partial (detonator fired) • Misfire (detonator did not fire)	EC		✓
Write "N/A" if there is no misfire.	• Misfire/partial-fire procedure started if shot not successful	NA	*	NA
24/7 numbers = PTLA scheduling 7-4438, shift commander 5-1279	• Notify PTLA of need /no need for overnight guards	NA		NA
Photon Doppler Velocimeter – Laser system in counting house	• PDV laser, if used, shutdown and key REMOVED	NA		NA
Shut down = Laser Power supply turned OFF and key removed.	• VISAR shut down, if applicable, and key(s) removed	NA	*	NA
Firing Site Access Control 7-6742	• Access Control notified – Shot status • Cook off locks removed	EC NA	* *	✓ NA
Line C dome radioactive exhaust must be ON before pumping. EIC console, Apps, right click, LXL, XAEF1L3 FLOW and 1L97 ON	• Area A radioactive exhaust stack fan is ON Do not rely upon Run Permit Ready - check line by line display	EC		✓
Uranium and Plutonium	• Inner container pressure Torr • Vessel pressure Torr	NA NA		NA NA
Read post shot pressure remotely. **NOTE: Three pump downs and two vents are a MUST for industrial health safety no matter how small the shot. After the first pump down to remove the HE products, two more air fills must be pumped out to ensure industrial safety.** **Uranium, Vanadium, etc.** need to cool before venting to reduce fire (**Uranium**) and/or slower oxidation (toxic **Vanadium** oxide).	• Upstream pressure D Close Upstream Pump Valve • Open Upstream blast valve - post shot pressure = 15 torr • Open Upstream pump valve to begin pumping • Open Downstream blast & pump valves to help pumping • Pump down (1) to less than 1,000 microns (5 torr) • Fiducial plate beam picture to verify collimators are clear • Flammable materials (like U) - 30 minutes before venting	EC EC EC EC EC EC NA	* * * * * *	✓ ✓ ✓ ✓ ✓ ✓ NA
Normally, the first two vents are fast to blow out the collimators. For shots with potentially flammable post shot debris, like U, all venting is slow. **Venting is not required before an entry.**	• Vent 1 – Close Pump Valves & Open Atmosphere Vent valves • Pump down (2) to less than 1,000 microns (5 torr) • Vent 2 – Close Pump Valves & Open Atmosphere Vent valves • Pump down (3) to less than 1,000 microns (5 torr) • Vent 3 – Slow – Close both pump valves • Open slow vent valve	EC EC EC EC EC EC	- - - - - *	✓ ✓ ✓ ✓ ✓ ✓
The initial entry team should always be minimized.	• EIC and firing leader both agree that Line C can be entered	EC		✓
	• Notify CCR that the Line C dome CO is 0 ppm before entry	EC		✓
	• Portable CO monitor in the hands of the entry team	EC	*	✓
Uranium and Plutonium	• Level II Anti-C on both the firing leader and RCT • Respirator for both • LAM reading OK	NA NA NA		NA NA NA

Until after the firing leader has checked for a breach, dome entries after a shot are a high explosives operation. Lightning/ field level – local indication, Access Control, or Meteorologist PPE includes tyvek suits, respirators, gloves, etc.	• Door/weather watch assigned for HE operations • Weather/Lightning status OK • Workers briefed on PPE requirements and work segregation • Firing leader is controlling dome PACS keys • U/Pu – Reminder - disconnect venture pump before opening	EC EC EC EC NA	* *	✓ ✓ ✓ ✓ NA
HE operation - Team going in is in radio contact with a person outside.	• Radio Check – door watch to access control • Radio Check – entry team - door watch from inside shield door	EC EC	* *	✓ ✓
Uranium and Plutonium	• Graffit air monitor checked for contamination	NA		NA
	• Clock off linear key removed	NA		NA
	• Breach procedures implemented if a breach has occurred	NA		NA
The dome area is a HE exclusion area.	• Firing Leader releases Line C for additional access	EC	*	✓
The EIC makes this decision after the firing leader agrees	• Notify CCR that special re-entry procedure - NOT in effect • If HE is still present Notify CCR Line C compound to be an HE exclusion area due to unburned HE. Please do not permit entries into the line B tunnel without EIC approval	EC NA		✓ NA
Classified shots only	• Bomb Badge returned	NA	*	NA
	• Sign removed – Special Re-Entry Procedure - Line C key bank	EC		✓
The dome area has been a HE exclusion area.	• Microphone – Turn OFF amplifier	EC	*	✓
	• Gas cooling/heating system disconnected from vessel	NA	*	NA
Upstream vacuum station bypass ensures vessel fresh air via venture. **Uranium and Plutonium** – No air flow through vessel! Hazardous materials exclusion areas are normally 10' in front of the vessel and bags on the windows. Samples must be sent out for analysis.	• Remind vessel clean up crew to open vacuum bypass valve • Vacuum pump air line disconnected • Establish exclusion areas prior to opening vessel and pipe • Samples taken from vessel for analysis of contamination	EC NA NA NA	*	✓ NA NA NA
	• CO Monitor in dome – Turn OFF	EC		✓
Prior to removing vacuum windows	• Beam Window covers installed at • IL0 upstream • IL1 downstream (after camera station removed)			
Plutonium – Put it back in the safe	• Compliance signed inside Radioactive Materials Balance Area	NA		NA

???? LAST SHOT of the day ????	• LAST SHOT of the day?			✓
	• TV Cameras and lights OFF • CO monitor & vacuum gauges at blue racks • Upstream valves • Downstream valves	___ ___ ___ ___		___ ___ ___ ___
	• VISAR status signs = Green	NA		NA
The one in the dome usually stays in the dome with its charger in the blue rack. The other one charges on the bench west of the VISAR room.	• CO monitors in chargers	EC		✓
The EIC and Firing Leader must both agree	• Nearly CCH that HE operations are completed for the day	EC		✓
Locking out is preferable to log off.	• Lightning Detector Computers – Lock out	EC		✓
	• After HE operations are completed: remove signs • Large orange HE indicator – truck door • Small signs for HE and EIC • Lane C Shield door • Lane C access station (PAC-5) • Lane B tunnel access (NTOF main door) • Special Re-Entry – Lane B tunnel access (NTOF maze door)	EC		✓ ✓ ✓ ✓ ✓ ✓ ✓
Run out of propane - starter cranks until battery dies or starter fails	• Disable generator – Module 9 in "STOP"	EC		✓
Uranium and Plutonium	• CAM turned OFF • Dome Fans unlocked	NA NA		NA NA
	• Remove parking lot rope to truck access for "Fire Lane"	___		___
	• RWP – General RWP is current and posted	NA		NA
http://pwcnv02.lanl.gov/arakfram.htm?7:0 – Username/PW = APC/apc http://praddalek02/arakfram.htm?7:0 Dalek can also be turned off by cycling key switch in dome without Reset.	• HV to beam line data taking cameras – Turned Off • Dalek OFF – Look in the back of HS-R02 • No 120V or 208V power cord connections on floor	___ ___ EC		___ ___ ✓
	• CCH doors locked	[illegible]		✓
Install vacuum window covers IL = Image location Thin vacuum windows have protective covers to guard against blowouts. CanNOT be required if additional beam operations are scheduled.	• IL0 (upstream side) • IL1 (downstream side) • IL2 (both sides)	___ ___ [illegible]		✓ ✓ ✓
Master transfer key removed from transfer block and locked in PACS box	• Dome PACS keys locked in key bank	[illegible]		✓

prad267			cvr to db	db to foi	FOI Camera	DB to 1st camera (us)	CVR TO 1ST CAM	FC TIME REL TO H-GX	
Magic Cone Test			3.258	7.1	H	7.1	2	300	
	Camera	Daq Timing	seperation between pulses (ns)	CCPG pattern start	CCPG pattern stop	width	X=gone	Rel To CVR	REL to FOI
1	H	0	0	300000	300060	60	X=gone	2	-3.00
2	F1	1000	1000	301000	301060	60	X=gone	3	-2.00
3	K	2000	1000	302000	302060	60		4	-1.00
4	G1	3000	1000	303000	303060	60	X=gone	5	0.00
5	N	4000	1000	304000	304060	60		6	1.00
6	F2	5000	1000	305000	305060	60		7	2.00
7	Q	6000	1000	306000	306060	60	X=gone	8	3.00
8	G2	7000	1000	307000	307060	60		9	4.00
9	A	8000	1000	308000	308060	60	X=gone	10	5.00
10	T	9000	1000	309000	309060	60		11	6.00
11	F3	10000	1000	310000	310060	60	X=gone	12	7.00
12	X	11000	1000	311000	311060	60		13	8.00
13	G3	12000	1000	312000	312060	60	X=gone	14	9.00
14	I	13000	1000	313000	313060	60		15	10.00
15	F4	14000	1000	314000	314060	60		16	11.00
16	B	15000	1000	315000	315060	60		17	12.00
17	L	16000	1000	316000	316060	60	X=gone	18	13.00
18	G4	17000	1000	317000	317060	60	X=gone	19	14.00
19	O	18000	1000	318000	318060	60		20	15.00
20	F5	19000	1000	319000	319060	60		21	16.00
21	R	20000	1000	320000	320060	60		22	17.00
22	G5	21000	1000	321000	321060	60		23	18.00
23	C	22000	1000	322000	322060	60	X=gone	24	19.00
24	U	23000	1000	323000	323060	60	X=gone	25	20.00
25	F6	24000	1000	324000	324060	60	X=gone	26	21.00
26	Y	25000	1000	325000	325060	60		27	22.00
27	G6	26000	1000	326000	326060	60	X=gone	28	23.00
28	J	27000	1000	327000	327060	60		29	24.00
29	F7	28000	1000	328000	328060	60		30	25.00
30	D	29000	1000	329000	329060	60		31	26.00
31	M	30000	1000	330000	330060	60		32	27.00
32	G7	31000	1000	331000	331060	60		33	28.00
33	P	32000	1000	332000	332060	60	X=gone	34	29.00
34	F8	33000	1000	333000	333060	60		35	30.00
35	S	34000	1000	334000	334060	60		36	31.00
36	G8	35000	1000	335000	335060	60		37	32.00
37	E	36000	1000	336000	336060	60	X=gone	38	33.00
38	V	37000	1000	337000	337060	60		39	34.00
39	F9	38000	1000	338000	338060	60	X=gone	40	35.00
40	Z	39000	1000	339000	339060	60	X=gone	41	36.00
41	G9	40000	1000	340000	340060	60	X=gone	42	37.00

Count Down	
LR to First	2

Camera	Pulse No.
1	#N/A
2	#N/A
E	36000
H	0
I	13000
J	27000
K	2000
L	16000
M	30000
N	4000
O	18000
P	32000
Q	6000
R	20000
S	34000
T	9000
U	23000
V	37000
X	11000
Y	25000
Z	39000
A	8000
B	15000
C	22000
D	29000
F1	1000
F2	5000
F3	10000
F4	14000
F5	19000
F6	24000
F7	28000
F8	33000
F9	38000
G1	3000
G2	7000
G3	12000
G4	17000
G5	21000
G6	26000
G7	31000
G8	35000
G9	40000

A	X=gone
C	X=gone
E	X=gone
F1	X=gone
F3	X=gone
F6	X=gone
F9	X=gone
G1	X=gone
G3	X=gone
G4	X=gone
G6	X=gone
G9	X=gone
H	X=gone
L	X=gone
P	X=gone
Q	X=gone
U	X=gone
Z	X=gone
B	
D	
F2	
F4	
F5	
F7	
F8	
G2	
G5	
G7	
G8	
I	
J	
K	
M	
N	
O	
R	
S	
T	
V	
X	
Y	

42953 | 6/23/2009 8:10:49 AM | **EIC** | Edit

PRAD0368 - Sandwich - DE9 Sandwich

Beam Line Change

Beam Line Changed to 2009-DE9 Sandwich

Beam Line Title: 2009-DE9 Sandwich - 06/23/2009 - 6 Foot [113]

Comment: 2009-DE9 Sandwich

Mode: 4 Quad -I

Vessel: 6 Foot

Collimator IL0: 9.5 mr Taper

Collimator IL1: 10 mr Taper

Collimator IL2: N/A

Window IL0: 250 mill Al

Window Object Up: N/A

Window Object Down: N/A

Window Up IL1: 250 mill Al

Window Down IL1: 20 mil AL (NG)

Window IL2: 62.5 mil Al

Converter IL0: Beam Ion Chamber

Converter IL1: 1.9 mm LSO, 2x3

Converter IL2: 2.2 mm 9 element LSO mosaic

Location: LANSCE, Line C, Cave

Key: 113

Date Created: 6/23/2009

42996 | 6/23/2009 5:45:39 PM | **DAQ On-line**

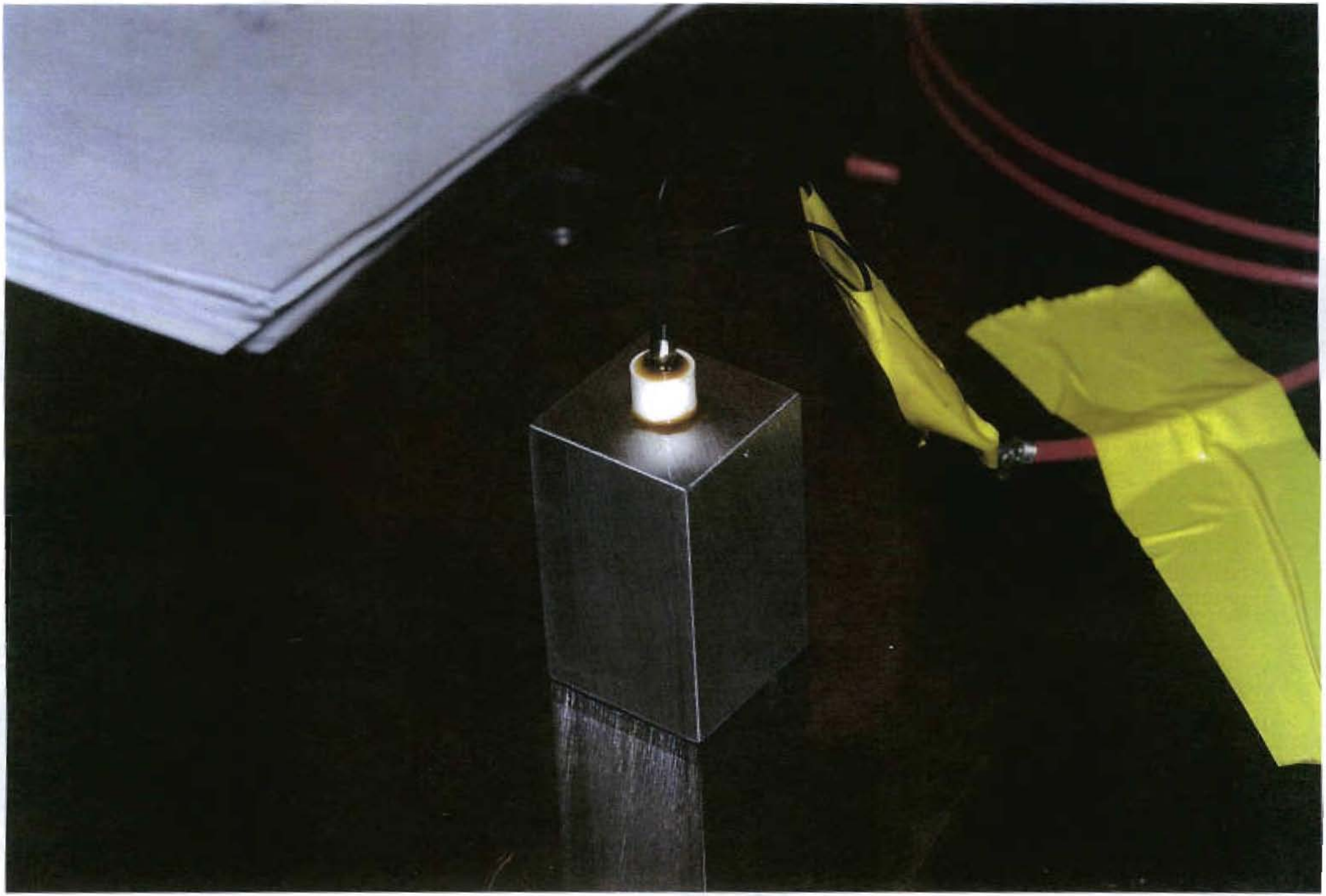
| Edit

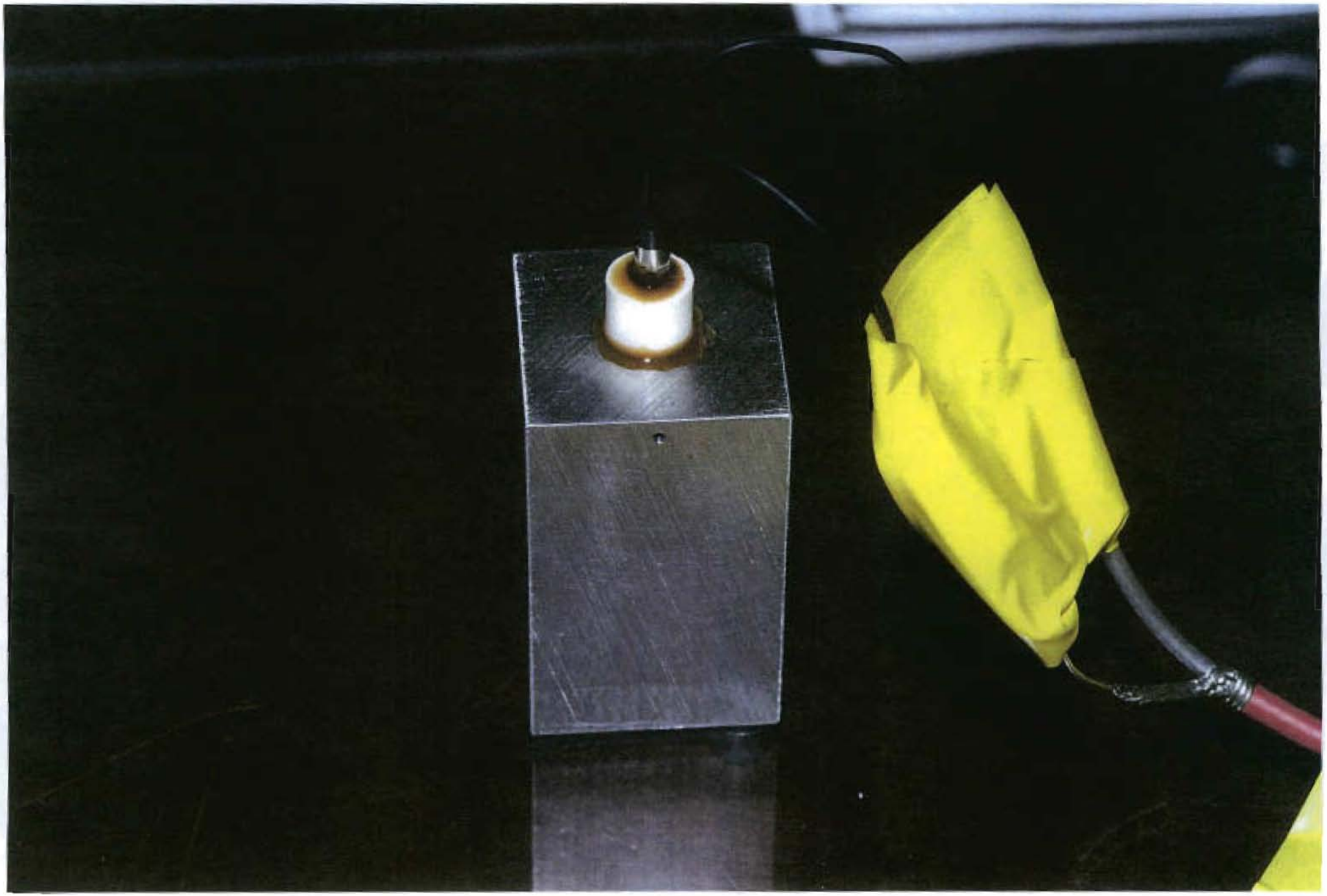
PRAD0368 - Sandwich - DE9 Sandwich

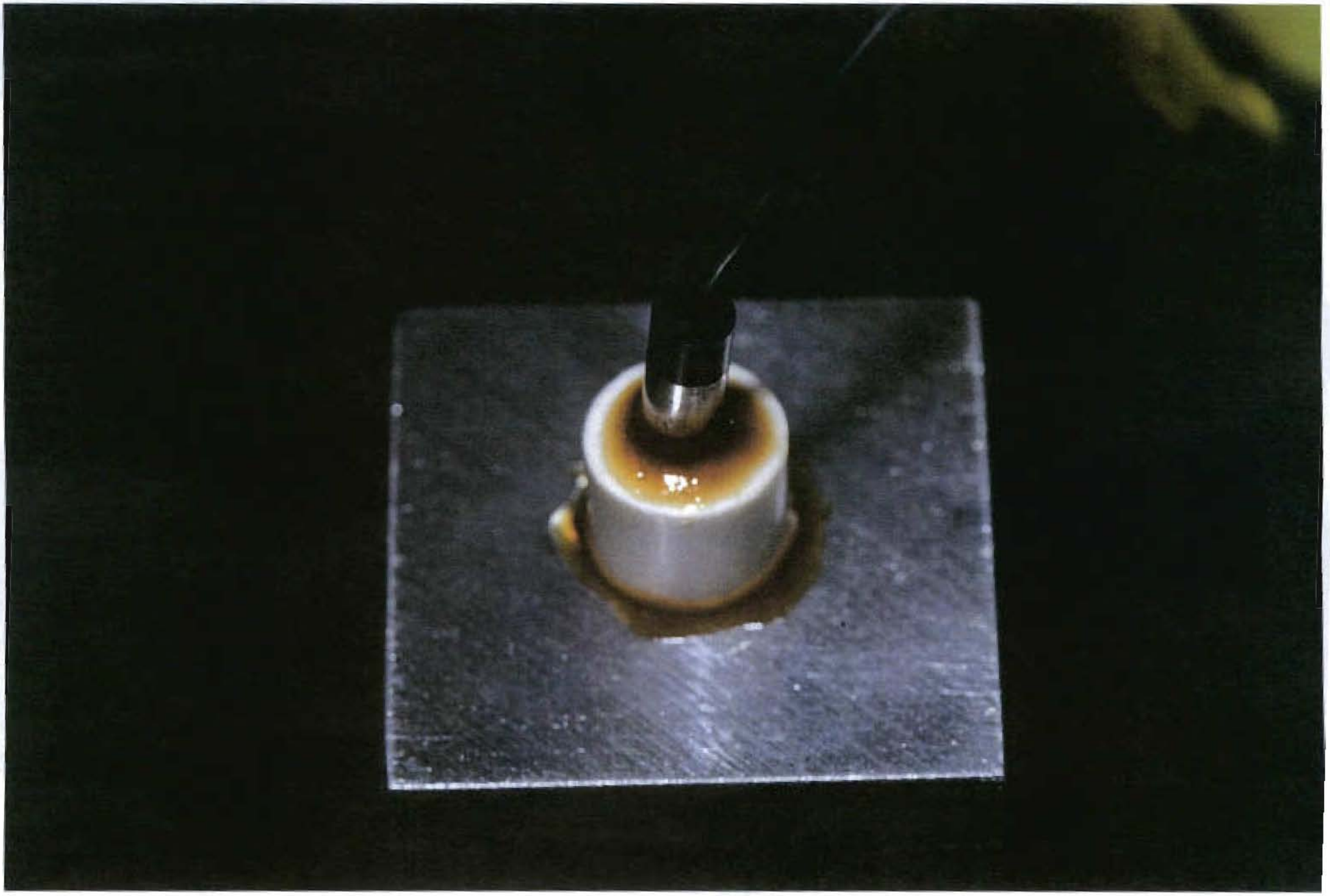
Run: 36469 Picture: 31186 Type: Dynamic

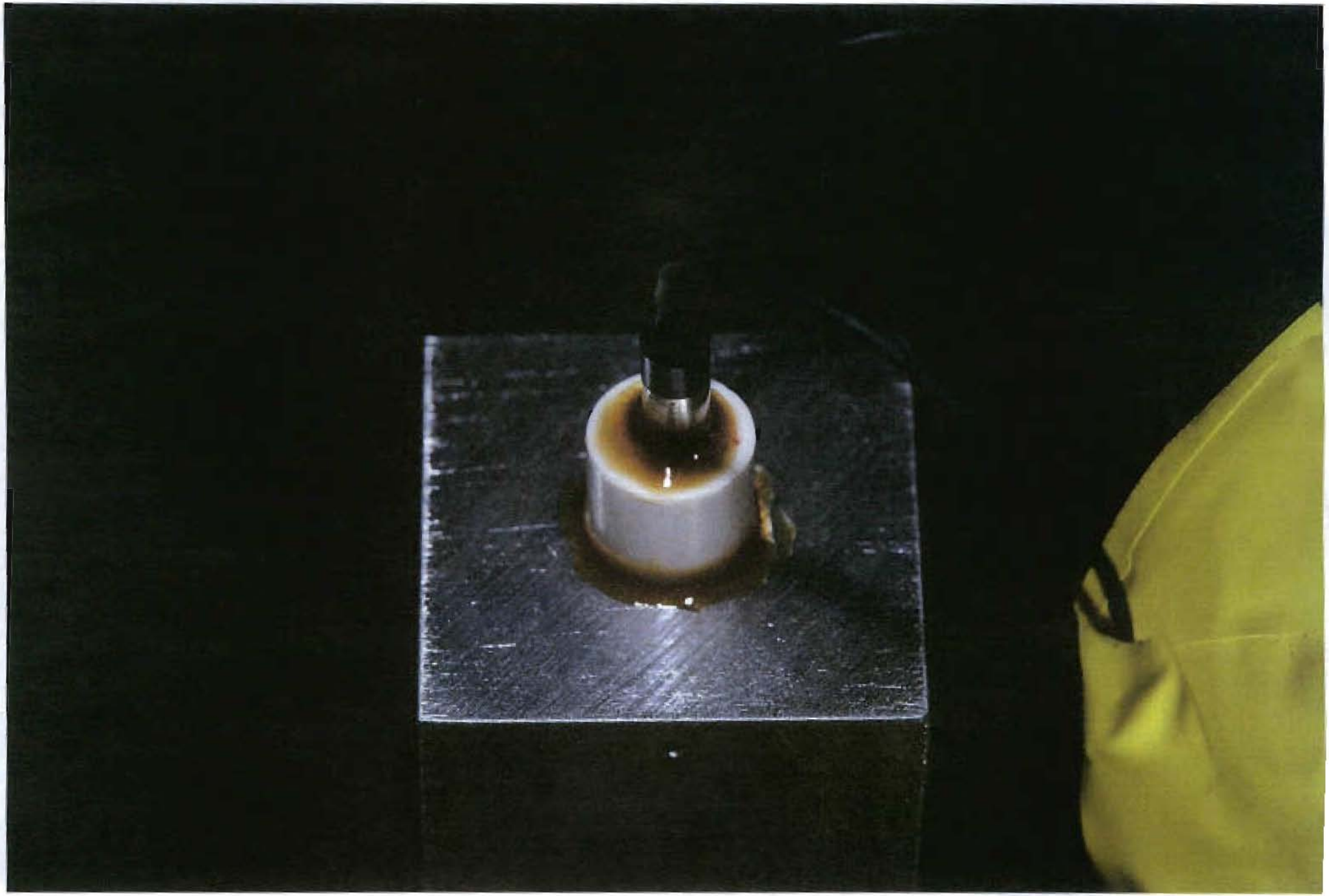
Start Run

06/23 *Start Run* **36469** PRAD 368, DE-9 Sandwich

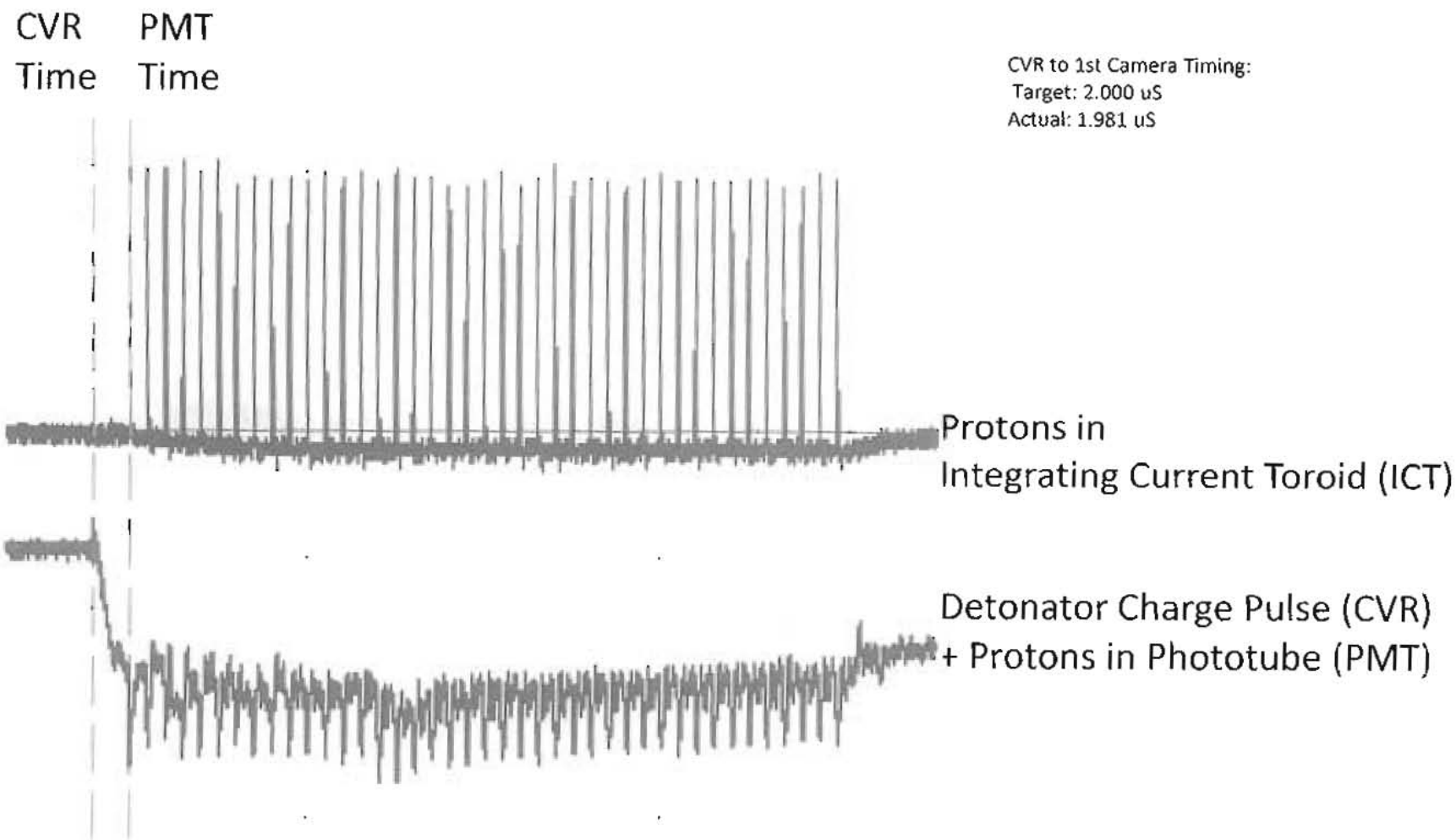








PRAD0367 Proton Timing Measurement



Proton Radiography

Science Based Stockpile Stewardship

● 42816 | 6/19/2009 10:17:28 AM | **EIC** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Beam Line Change

```
Beam Line Changed to Det Test 2009

Beam Line Title: Det Test 2009 - 06/19/2009 - 6 Foot [112]
Comment: Det Test 2009
Mode: 4 Quad -I
Vessel: 6 Foot
Collimator IL0: 9.5 mr Taper
Collimator IL1: 10 mr Taper
Collimator IL2: N/A
Window IL0: 250 mill Al
Window Object Up: N/A
Window Object Down: N/A
Window Up IL1: 250 mill Al
Window Down IL1: 20 mil AL (NG)
Window IL2: 62.5 mil Al
Converter IL0: Beam Ion Chamber
Converter IL1: 1.9 mm LSO, 2x3
Converter IL2: 2.2 mm 9 element LSO mosaic
Location: LANSCE, Line C, Cave
Key: 112
Date Created: 6/19/2009 9:44:59 AM
```

Basic Filters	Content Filters
○ By Date ○ Last 10 ○ Today ○ This Week ○ This Month ◉ This Year ○ All	Date Range Start 8/31/2009 / 9/1/2009 End ☐ Name EIC ☑ Text Entry Beam Line Change ☑ Activity No PRAD0367 - Detonator Test - Magic Cone Test ☐ Expt Family Miscellaneous ☐ Pic Type Other ☐ Run No ☐ Pic No

Check checkboxes to select content filters ("" , * , ? chars allowed).

Refresh Hide Filters New Entry

PRAD Home > Logbook Home

PRAD On-Line | Logbook | PRAD Off-Line | Run Status | Beam Status | Phone

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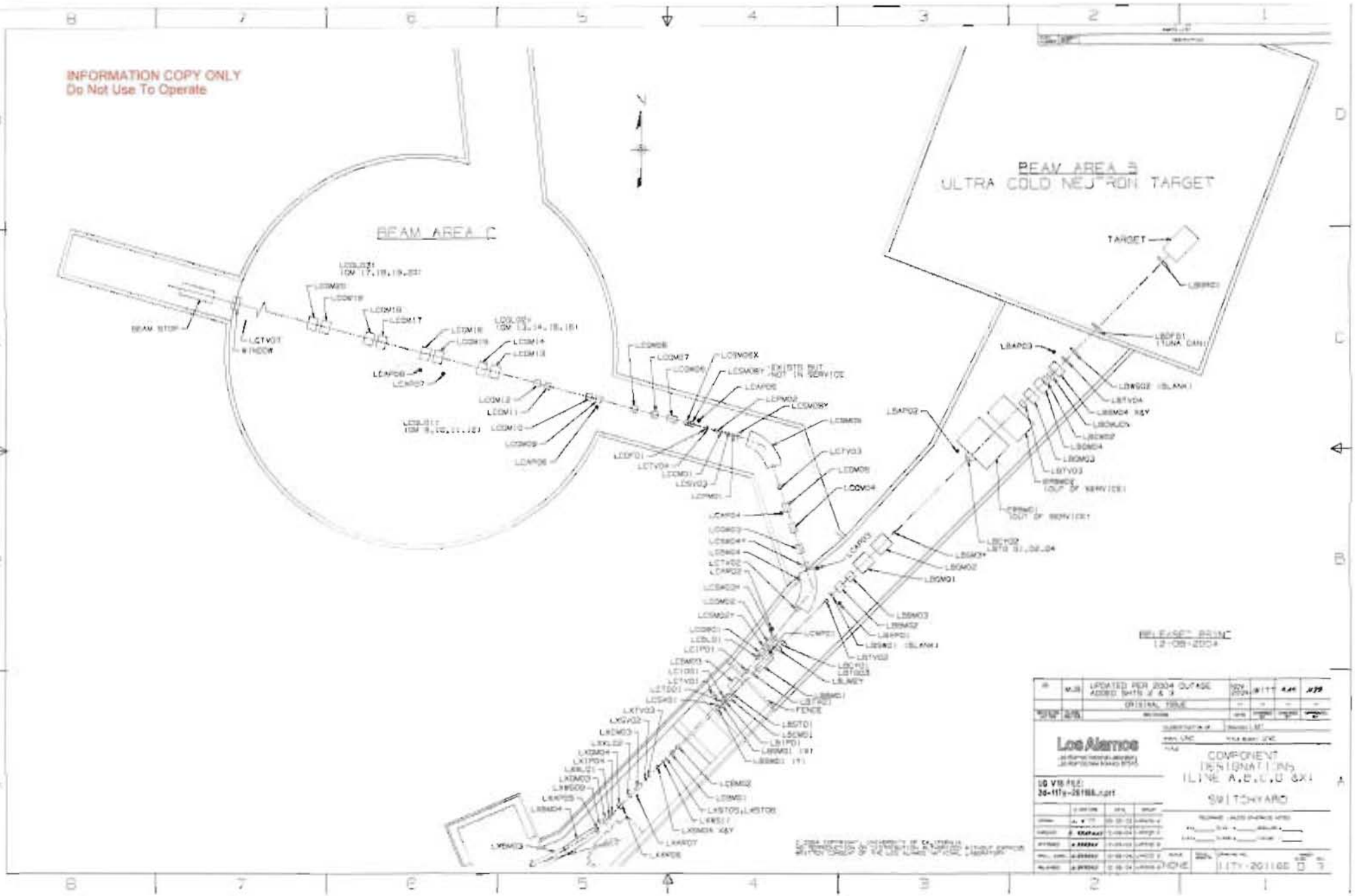


Proton Radiography
Science Based Stockpile Stewardship

42814 | 6/19/2009 9:42:01 AM | **EIC** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Activity Change

Activity Changed to PRAD0367 [478]

42815 | 6/19/2009 9:54:14 AM | **EIC** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: Picture: Type: HV Off

Picture Type Change

Picture Type changed to HV Off [13]

42816 | 6/19/2009 10:17:28 AM | **EIC** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Beam Line Change

Beam Line Changed to Det Test 2009

Beam Line Title: Det Test 2009 - 06/19/2009 - 6 Foot [112]

Comment: Det Test 2009

Mode: 4 Quad -I

Vessel: 6 Foot

Collimator IL0: 9.5 mr Taper

Collimator IL1: 10 mr Taper

Collimator IL2: N/A

Window IL0: 250 mill Al

Window Object Up: N/A

Window Object Down: N/A

Window Up IL1: 250 mill Al

Window Down IL1: 20 mil AL (NG)

Window IL2: 62.5 mil Al

Converter IL0: Beam Ion Chamber

Converter IL1: 1.9 mm LSO, 2x3

Converter IL2: 2.2 mm 9 element LSO mosaic

Location: LANSCE, Line C, Cave

Key: 112

Date Created: 6/19/2009 9:44:59 AM

42817 | 6/19/2009 11:25:54 AM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: Picture: 31058 Type: HV Off

Independent Picture

06/19 11:25 *Picture* 31058, HV Off, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, G, E, F, A, B, C

42818 | 6/19/2009 11:26:44 AM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: Picture: 31059 Type: HV Off

Independent Picture

06/19 11:26 *Picture* 31059, HV Off, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, G, E, F, A, B, C

42819 | 6/19/2009 11:27:20 AM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: 36347 Picture: 31060 Type: HV Off

Start Run

06/19 11:27	*Start Run* 36347	PRAD 367, Magic Mushroom Detonator Test
06/19 11:27	*Arm*	
06/19 11:27	*Info*	Manual Trigger from PCPRAD307
06/19 11:27	*Trigger*	
06/19 11:27	*Picture* 31060	HV Off, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, G, E, F, A, B, C, D
06/19 11:28	*End Run*	

42820 | 6/19/2009 11:29:09 AM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: 36348 Picture: 31061 Type: HV Off

Start Run

06/19 11:29	*Start Run* 36348	PRAD 367, Magic Mushroom Detonator Test
06/19 11:29	*Arm*	
06/19 11:29	*Info*	Manual Trigger from PCPRAD307
06/19 11:29	*Trigger*	
06/19 11:29	*Picture* 31061	HV Off, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, G, E, F, A, B, C, D
06/19 11:30	*End Run*	

42821 | 6/19/2009 11:41:14 AM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: 36349 Picture: 31062 Type: HV Off

Start Run

06/19 11:41	*Start Run* 36349	PRAD 367, Magic Mushroom Detonator Test
06/19 11:41	*Arm*	
06/19 11:41	*Info*	Manual Trigger from PCPRAD307
06/19 11:41	*Trigger*	
06/19 11:41	*Picture* 31062	HV Off, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, G, E, F, A, B, C, D
06/19 11:42	*End Run*	

42836 | 6/22/2009 8:01:13 AM | **EIC** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Activity Change

Activity Changed to PRAD0367 [478]

42837 | 6/22/2009 8:01:13 AM | **EIC** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: Picture: Type: HV Off

Picture Type Change

Picture Type changed to HV Off [13]

42888 | 6/22/2009 8:56:04 AM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: Picture: 31113 Type: HV Off

Independent Picture

06/22 08:56 *Picture* **31113**, HV Off, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B, C, D

42889 | 6/22/2009 8:56:53 AM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: Picture: 31114 Type: HV Off

Independent Picture

06/22 08:56 *Picture* **31114**, HV Off, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B, C, D

42890 | 6/22/2009 8:58:48 AM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: 36403 Picture: 31115 Type: HV Off

Start Run

06/22 08:58	*Start Run* **36403**	PRAD 367, Magic Mushroom Detonator Test
06/22 08:59	*Arm*	
06/22 08:59	*Info*	**Manual Trigger** from PCPRAD307
06/22 08:59	*Trigger*	
06/22 08:59	*Picture* **31115**	HV Off, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B, C, D, G
06/22 09:00	*End Run*	

42891 | 6/22/2009 9:00:51 AM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: 36404 Picture: 31116 Type: HV Off

Start Run

06/22 09:00	*Start Run* **36404**	PRAD 367, Magic Mushroom Detonator Test
06/22 09:00	*Arm*	
06/22 09:01	*Info*	**Manual Trigger** from PCPRAD307
06/22 09:01	*Trigger*	
06/22 09:01	*Picture* **31116**	HV Off, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B, C, D, G
06/22 09:02	*End Run*	

42892 | 6/22/2009 9:56:38 AM | **EIC** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Camera Delays

PRAD Trigger Settings - PRAD 367 ,MMD Test

Walk Offset: 0

Camera	Delay	Total Delay	Width
E	35	283.43	0.3
A	8	256.48	0.3
B	15	263.46	0.3
C	22	270.46	0.3
D	29	277.46	0.3
F1	1	249.72	0.2

F2	5	253.72	0.21
F3	10	258.72	0.21
F4	14	262.72	0.21
F5	19	267.72	0.21
F6	24	272.72	0.21
F7	28	276.72	0.21
F8	33	281.72	0.21
F9	37	285.72	0.21
G1	3	251.72	0.2
G2	7	255.72	0.21
G3	12	260.72	0.21
G4	17	265.72	0.21
G5	21	269.72	0.21
G6	26	274.72	0.21
G7	31	279.72	0.21
G8	34	282.72	0.21
G9	39	287.72	0.21
H	0	248.69	0.2
I	13	261.69	0.2
J	27	275.69	0.2
K	2	250.7	0.2
L	16	264.7	0.2
M	30	278.7	0.2
N	4	252.71	0.2
O	18	266.71	0.2
P	32	280.71	0.2
Q	6	254.69	0.2
R	20	268.69	0.2
S	33	281.69	0.2
T	9	257.69	0.2
U	23	271.69	0.2
V	36	284.69	0.2
X	11	259.69	0.2
Y	25	273.69	0.2
Z	38	286.69	0.2

42893 | 6/22/2009 10:16:59 AM | **EIC** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Camera Delays

PRAD Trigger Settings - PRAD 367 ,MMD Test

Walk Offset: 0

Camera	Delay	Total Delay	Width
E	36	284.43	0.3
A	8	256.48	0.3
B	15	263.46	0.3
C	22	270.46	0.3
D	29	277.46	0.3
F1	1	249.72	0.2
F2	5	253.72	0.21
F3	10	258.72	0.21
F4	14	262.72	0.21
F5	19	267.72	0.21
F6	24	272.72	0.21
F7	28	276.72	0.21
F8	33	281.72	0.21
F9	38	286.72	0.21
G1	3	251.72	0.2

G2	7	255.72	0.21
G3	12	260.72	0.21
G4	17	265.72	0.21
G5	21	269.72	0.21
G6	26	274.72	0.21
G7	31	279.72	0.21
G8	35	283.72	0.21
G9	40	288.72	0.21
H	0	248.69	0.2
I	13	261.69	0.2
J	27	275.69	0.2
K	2	250.7	0.2
L	16	264.7	0.2
M	30	278.7	0.2
N	4	252.71	0.2
O	18	266.71	0.2
P	32	280.71	0.2
Q	6	254.69	0.2
R	20	268.69	0.2
S	34	282.69	0.2
T	9	257.69	0.2
U	23	271.69	0.2
V	37	285.69	0.2
X	11	259.69	0.2
Y	25	273.69	0.2
Z	39	287.69	0.2

42894 | 6/22/2009 10:58:21 AM | **TNThompson** | Edit PRAD0367 - Detonator Test - Magic Cone Test

HE is here.

42895 | 6/22/2009 1:44:18 PM | **EIC** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: Picture: Type: Dark Field

Picture Type Change

Picture Type changed to Dark Field (1)

42896 | 6/22/2009 1:44:23 PM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: 36405 Picture 31117 Type: Dark Field

Start Run

06/22 13:44	*Start Run* **36405**	PRAD 367, Magic Mushroom Detonator Test
06/22 13:44	*Arm*	
06/22 13:44	*Info*	Manual Trigger from PCPRAD307
06/22 13:44	*Trigger*	
06/22 13:44	*Picture* **31117**	Dark Field, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B, C, D, G
06/22 13:45	*End Run*	

42897 | 6/22/2009 1:47:37 PM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: 36406 Picture: 31118 Type: Dark Field

Start Run

06/22	*Start Run*	PRAD 367, Magic Mushroom Detonator Test

13:47	36406	
06/22 13:47	*Arm*	
06/22 13:47	*Info*	Manual Trigger from PCPRAD307
06/22 13:47	*Trigger*	
06/22 13:47	*Picture* 31118	Dark Field, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B, C, D, G
06/22 13:48	*End Run*	

42898 | 6/22/2009 2:14:59 PM | **EIC** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: Picture: Type: Focus

Picture Type Change

Picture Type changed to Focus (3)

42899 | 6/22/2009 2:20:18 PM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: 36407 Picture: 31119 Type: Focus

Start Run

06/22 14:20	*Start Run* 36407	PRAD 367, Magic Mushroom Detonator Test
06/22 14:26	*Arm*	
06/22 14:26	*Trigger*	
06/22 14:26	Lens 1	1745
06/22 14:26	Lens 1	125.586
06/22 14:26	Lens 2	1541.728
06/22 14:26	Lens 2	1530
06/22 14:26	Lens 2	1525.135
06/22 14:26	Lens 3	1510
06/22 14:26	Lens 3	1534.55
06/22 14:26	Diffuser	1040
06/22 14:26	*Picture* 31119	Focus, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B, C, D, G
06/22 14:27	*End Run*	

42900 | 6/22/2009 2:43:23 PM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: 36408 Picture: 31120 Type: Focus

Start Run

06/22 14:43	*Start Run* 36408	PRAD 367, Magic Mushroom Detonator Test
06/22 14:43	*Arm*	
06/22 14:43	*Trigger*	
06/22 14:43	Lens 1	1745
06/22 14:43	Lens 1	125.561
06/22 14:43	Lens 2	1541.797

06/22 14:43	Lens 2	1530
06/22 14:43	Lens 2	1525.023
06/22 14:43	Lens 3	1510
06/22 14:43	Lens 3	1534.205
06/22 14:43	Diffuser	1040
06/22 14:43	*Picture* 31120	Focus, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B, C, D, G
06/22 14:44	*End Run*	

42901 | 6/22/2009 2:52:51 PM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: 36409 Picture: 31121 Type: Focus

Start Run

06/22 14:52	*Start Run* 36409	PRAD 367, Magic Mushroom Detonator Test
06/22 14:52	*Arm*	
06/22 14:53	*Trigger*	
06/22 14:53	Lens 1	1745
06/22 14:53	Lens 1	125.498
06/22 14:53	Lens 2	1536.724
06/22 14:53	Lens 2	1525
06/22 14:53	Lens 2	1520.088
06/22 14:53	Lens 3	1510
06/22 14:53	Lens 3	1534.243
06/22 14:53	Diffuser	1040
06/22 14:53	*Picture* 31121	Focus, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B, C, D, G
06/22 14:54	*End Run*	

42902 | 6/22/2009 2:55:04 PM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: 36410 Picture: 31122 Type: Focus

Start Run

06/22 14:55	*Start Run* 36410	PRAD 367, Magic Mushroom Detonator Test
06/22 14:55	*Arm*	
06/22 14:55	*Trigger*	
06/22 14:55	Lens 1	1745
06/22 14:55	Lens 1	125.508
06/22 14:55	Lens 2	1531.716
06/22 14:55	Lens 2	1520
06/22 14:55	Lens 2	1515.162
06/22 14:55	Lens 3	1510

06/22 14:55	Lens 3	1534.355
06/22 14:55	Diffuser	1040
06/22 14:55	*Picture* 31122	Focus, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B, C, D, G
06/22 14:56	*End Run*	

42903 | 6/22/2009 2:57:13 PM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: 36411 Picture: 31123 Type: Focus

Start Run

06/22 14:57	*Start Run* 36411	PRAD 367, Magic Mushroom Detonator Test
06/22 14:57	*Arm*	
06/22 14:57	*Trigger*	
06/22 14:57	Lens 1	1745
06/22 14:57	Lens 1	125.507
06/22 14:57	Lens 2	1546.728
06/22 14:57	Lens 2	1535
06/22 14:57	Lens 2	1530.319
06/22 14:57	Lens 3	1510
06/22 14:57	Lens 3	1534.448
06/22 14:57	Diffuser	1040
06/22 14:57	*Picture* 31123	Focus, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B, C, D, G
06/22 14:58	*End Run*	

42904 | 6/22/2009 3:00:29 PM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: 36412 Picture: 31124 Type: Focus

Start Run

06/22 15:00	*Start Run* 36412	PRAD 367, Magic Mushroom Detonator Test
06/22 15:00	*Arm*	
06/22 15:00	*Trigger*	
06/22 15:00	Lens 1	1745
06/22 15:00	Lens 1	125.499
06/22 15:00	Lens 2	1551.719
06/22 15:00	Lens 2	1540
06/22 15:00	Lens 2	1535.388
06/22 15:00	Lens 3	1510
06/22 15:00	Lens 3	1534.313
06/22 15:00	Diffuser	1040
06/22 15:00	*Picture* 31124	Focus, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B, C, D, G

06/22 15:01	*End Run*

42905 | 6/22/2009 3:03:16 PM | **EIC** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: Picture: Type: Timing Check

Picture Type Change

Picture Type changed to Timing Check [24]

42906 | 6/22/2009 3:03:22 PM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: 36413 Picture: 31125 Type: Timing Check

Start Run

06/22 15:03	*Start Run* **36413**	PRAD 367, Magic Mushroom Detonator Test
06/22 15:03	*Arm*	
06/22 15:03	*Trigger*	
06/22 15:03	*Picture* **31125**	Timing Check, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B, C, D, G
06/22 15:04	*End Run*	

42907 | 6/22/2009 3:13:28 PM | **EIC** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: Picture: Type: PreShot

Picture Type Change

Picture Type changed to PreShot [6]

42908 | 6/22/2009 3:14:47 PM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: 36414 Picture: 31126 Type: PreShot

Start Run

06/22 15:14	*Start Run* **36414**	PRAD 367, Magic Mushroom Detonator Test
06/22 15:15	*Arm*	
06/22 15:15	*Trigger*	
06/22 15:15	MP Width	0
06/22 15:15	MP Countdown	99999
06/22 15:16	*Picture* **31126**	PreShot, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B, C, D, G
06/22 15:16	*End Run*	

42909 | 6/22/2009 3:18:58 PM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: 36415 Picture: 31127 Type: PreShot

Start Run

06/22 15:18	*Start Run* **36415**	PRAD 367, Magic Mushroom Detonator Test
06/22 15:19	*Arm*	
06/22 15:19	*Trigger*	
06/22 15:19	MP Width	0

06/22 15:19	MP Countdown	99999
06/22 15:19	*Picture* 31127	PreShot, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B, C, D, G
06/22 15:20	*End Run*	

42910 | 6/22/2009 3:21:44 PM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: 36416 Picture: 31128 Type: PreShot

Start Run

06/22 15:21	*Start Run* 36416	PRAD 367, Magic Mushroom Detonator Test
06/22 15:21	*Arm*	
06/22 15:21	*Trigger*	
06/22 15:21	MP Width	0
06/22 15:21	MP Countdown	99999
06/22 15:22	*Picture* 31128	PreShot, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B, C, D, G
06/22 15:23	*End Run*	

42911 | 6/22/2009 3:26:18 PM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: 36417 Picture: 31129 Type: PreShot

Start Run

06/22 15:26	*Start Run* 36417	PRAD 367, Magic Mushroom Detonator Test
06/22 15:26	*Arm*	
06/22 15:26	*Trigger*	
06/22 15:26	MP Width	0
06/22 15:26	MP Countdown	99999
06/22 15:26	*Picture* 31129	PreShot, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B, C, D, G
06/22 15:27	*End Run*	

42912 | 6/22/2009 3:58:37 PM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: 36418 Picture: 31130 Type: PreShot

Start Run

06/22 15:58	*Start Run* 36418	PRAD 367, Magic Mushroom Detonator Test
06/22 15:58	*Arm*	
06/22 15:58	*Trigger*	
06/22 15:58	MP Width	0
06/22 15:58	MP Countdown	99999
06/22 15:59	*Picture* 31130	PreShot, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B, C, D, G
06/22 15:59	*End Run*	

42913 | 6/22/2009 4:01:07 PM | **EIC** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: Picture: Type: Dynamic

Picture Type Change

Picture Type changed to Dynamic [7]

42914 | 6/22/2009 4:02:16 PM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: 36419 Picture: 31131 Type: Dynamic

Start Run

06/22 16:02	*Start Run* **36419**	PRAD 367, Magic Mushroom Detonator Test
06/22 16:02	*Arm*	
06/22 16:02	*Trigger*	
06/22 16:02	Lens 1	1745
06/22 16:02	Lens 1	125.478
06/22 16:02	Lens 2	1546.952
06/22 16:02	Lens 2	1535
06/22 16:02	Lens 2	1530.193
06/22 16:02	Lens 3	1510
06/22 16:02	Lens 3	1534.548
06/22 16:02	Diffuser	1040
06/22 16:02	H-GX Gate Delay	200
06/22 16:02	H-GX Gate Length	625
06/22 16:02	MP Width	0
06/22 16:02	MP Countdown	99999
06/22 16:02	Beam Line Title	Det Test 2009 - 06/19/2009 - 6 Foot [112]
06/22 16:02	Comment	Det Test 2009
06/22 16:02	Mode	4 Quad -I
06/22 16:02	Vessel	6 Foot
06/22 16:02	Collimator IL0	9.5 mr Taper
06/22 16:02	Collimator IL1	10 mr Taper
06/22 16:02	Collimator IL2	N/A
06/22 16:02	Window IL0	250 mill Al
06/22 16:02	Window Object Up	N/A
06/22 16:02	Window Object Down	N/A
06/22 16:02	Window Up IL1	250 mill Al
06/22 16:02	Window Down IL1	20 mil AL (NG)
06/22 16:02	Window IL2	62.5 mil Al
06/22 16:02	Converter IL0	Beam Ion Chamber
06/22 16:02	Converter IL1	1.9 mm LSO, 2x3

06/22 16:02	Converter IL2	2.2 mm 9 element LSO mosaic
06/22 16:02	Location	LANSCE, Line C, Cave
06/22 16:02	Key	112
06/22 16:02	Date Created	6/19/2009 9:44:59 AM
06/22 16:02	*Picture* 31131	Dynamic, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B, C, D, G
06/22 16:03	*End Run*	

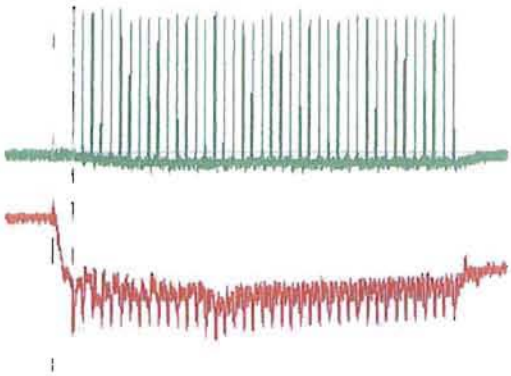
42915 | 6/22/2009 4:09:39 PM | **TNThompson** | Edit PRAD0367 - Detonator Test - Magic Cone Test

```
CVR to 1st Camera Timing:
Target:   2.000 uS
Actual:   1.981 uS

Markers: Scope 9, LeCroy LT584M

Time Markers
        1          2
1       0.0000E+00       -1.9806E-06
2       1.9806E-06       0.0000E+00

Value   2.4801E-04       2.4999E-04
```



File uploaded: ***P367.bmp*** of type ***image/bmp***

Click to open uploaded file

42916 | 6/22/2009 4:11:59 PM | **EIC** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: Picture: Type: Beam

Picture Type Change

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Picture Type changed to Beam (2)
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42917 | 6/22/2009 4:12:26 PM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: 36420 Picture: 31132 Type: Beam

Start Run

06/22 16:12	*Start Run* **36420**	PRAD 367, Magic Mushroom Detonator Test
06/22 16:12	*Arm*	
06/22 16:12	*Trigger*	
06/22 16:12	Diffuser	1040

06/22 16:12	MP Width	0
06/22 16:12	*Picture* 31132	Beam, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B, C, D, G
06/22 16:13	*End Run*	

42918 | 6/22/2009 4:14:40 PM | **EIC** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: Picture: Type: Dark Field

Picture Type Change

Picture Type changed to Dark Field [1]

42919 | 6/22/2009 4:15:41 PM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: Picture: 31133 Type: Dark Field

Independent Picture

06/22 16:15 *Picture* 31133, Dark Field, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B,

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42920 | 6/22/2009 4:16:47 PM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: Picture: 31134 Type: Dark Field

Independent Picture

06/22 16:16 *Picture* 31134, Dark Field, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B,

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42921 | 6/22/2009 4:17:37 PM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: Picture: 31135 Type: Dark Field

Independent Picture

06/22 16:17 *Picture* 31135, Dark Field, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B,

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42922 | 6/22/2009 4:18:26 PM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: Picture: 31136 Type: Dark Field

Independent Picture

06/22 16:18 *Picture* 31136, Dark Field, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B,

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42923 | 6/22/2009 4:18:43 PM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: 36421 Picture: 31137 Type: Dark Field

Start Run

06/22 16:18	*Start Run* 36421	PRAD 367, Magic Mushroom Detonator Test
06/22 16:18	*Arm*	
06/22 16:18	*Info*	Manual Trigger from PCPRAD307
06/22 16:18	*Trigger*	
06/22 16:18	*Picture* 31137	Dark Field, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B, C, D, G
06/22 16:19	*End Run*	

42924 | 6/22/2009 5:03:09 PM | **EIC** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: Picture: Type: Beam

Picture Type Change

Picture Type changed to Beam [2]

42925 | 6/22/2009 5:11:34 PM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: 36422 Picture: 31138 Type: Bad Picture

Start Run

06/22 17:11	*Start Run* **36422**	PRAD 367, Magic Mushroom Detonator Test
06/22 17:11	*Arm*	
06/22 17:11	*Trigger*	
06/22 17:11	Diffuser	1040
06/22 17:11	MP Width	0
06/22 17:11	*Picture* **31138**	Beam, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B, C, D, G
06/22 17:12	*End Run*	

42926 | 6/22/2009 5:15:02 PM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: 36423 Picture: 31139 Type: Beam

Start Run

06/22 17:15	*Start Run* **36423**	PRAD 367, Magic Mushroom Detonator Test
06/22 17:15	*Arm*	
06/22 17:15	*Trigger*	
06/22 17:15	Diffuser	1040
06/22 17:15	MP Width	0
06/22 17:15	*Picture* **31139**	Beam, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B, C, D, G
06/22 17:16	*End Run*	

42927 | 6/22/2009 5:16:30 PM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: 36424 Picture: 31140 Type: Beam

Start Run

06/22 17:16	*Start Run* **36424**	PRAD 367, Magic Mushroom Detonator Test
06/22 17:16	*Arm*	
06/22 17:16	*Trigger*	
06/22 17:16	Diffuser	1040
06/22 17:16	MP Width	0
06/22 17:16	*Picture* **31140**	Beam, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B, C, D, G
06/22 17:17	*End Run*	

42928 | 6/22/2009 5:18:03 PM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: 36425 Picture: 31141 Type: Beam

Start Run

06/22 17:18	*Start Run* **36425**	PRAD 367, Magic Mushroom Detonator Test
06/22 17:18	*Arm*	
06/22 17:18	*Trigger*	
06/22 17:18	Diffuser	1040
06/22 17:18	MP Width	0
06/22 17:18	*Picture* **31141**	Beam, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B, C, D, G
06/22 17:19	*End Run*	

42929 | 6/22/2009 5:19:27 PM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: 36426 Picture: 31142 Type: Beam

Start Run

06/22 17:19	*Start Run* **36426**	PRAD 367, Magic Mushroom Detonator Test
06/22 17:19	*Arm*	
06/22 17:19	*Trigger*	
06/22 17:19	Diffuser	1040
06/22 17:19	MP Width	0
06/22 17:19	*Picture* **31142**	Beam, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B, C, D, G
06/22 17:20	*End Run*	

42930 | 6/22/2009 5:20:59 PM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: 36427 Picture: 31143 Type: Beam

Start Run

06/22 17:20	*Start Run* **36427**	PRAD 367, Magic Mushroom Detonator Test
06/22 17:21	*Arm*	
06/22 17:21	*Trigger*	
06/22 17:21	Diffuser	1040
06/22 17:21	MP Width	0
06/22 17:21	*Picture* **31143**	Beam, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B, C, D, G
06/22 17:22	*End Run*	

42931 | 6/22/2009 5:22:29 PM | **EIC** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: Picture: Type: Large Fiducial

Picture Type Change

Picture Type changed to Large Fiducial [9]

42932 | 6/22/2009 5:24:29 PM | **DAQ On-line** | Edit PRAD0367 - Detonator Test - Magic Cone Test

Run: 36428 Picture: 31144 Type: Large Fiducial

Start Run

06/22 17:24	*Start Run* **36428**	PRAD 367, Magic Mushroom Detonator Test
06/22 17:24	*Arm*	
06/22 17:24	*Trigger*	
06/22 17:24	Lens 1	1745
06/22 17:24	Lens 1	125.677
06/22 17:24	Lens 2	1566.367
06/22 17:24	Lens 2	1555
06/22 17:24	Lens 2	1549.519
06/22 17:24	Lens 3	1535
06/22 17:24	Lens 3	1559.376
06/22 17:24	Diffuser	1040
06/22 17:24	*Picture* **31144**	Large Fiducial, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B, C, D, G
06/22 17:25	*End Run*	

42933 | 6/22/2009 5:27:01 PM | **DAQ On-line** | Edit | PRAD0367 - Detonator Test - Magic Cone Test

Run: 36429 Picture: 31145 Type: Large Fiducial

Start Run

06/22 17:27	*Start Run* **36429**	PRAD 367, Magic Mushroom Detonator Test
06/22 17:27	*Arm*	
06/22 17:27	*Trigger*	
06/22 17:27	Lens 1	1745
06/22 17:27	Lens 1	125.68
06/22 17:27	Lens 2	1566.637
06/22 17:27	Lens 2	1555
06/22 17:27	Lens 2	1549.95
06/22 17:27	Lens 3	1535
06/22 17:27	Lens 3	1559.508
06/22 17:27	Diffuser	1040
06/22 17:27	*Picture* **31145**	Large Fiducial, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, E, F, A, B, C, D, G
06/22 17:28	*End Run*	

42934 | 6/22/2009 5:29:41 PM | **EIC** | Edit | PRAD0367 - Detonator Test - Magic Cone Test

Run: Picture: Type: Walk Through

Picture Type Change

Picture Type changed to Walk Through [14]

42976 | 6/23/2009 1:53:31 PM | **ASaunders** | Edit | PRAD0367 - Detonator Test - Magic Cone Test

31145 is not a fidu plate picture

44134 | 7/27/2009 12:41:33 PM | ASaunders | Edit PRAD0367 - Detonator Test - Magic Cone Test

here is the timing sheet for 367

prad267				cvr to db	db to foi		FOI Camera		DB to 1st camera (us)	CVR TO 1ST CAM F
Magic Cone Test				3.258	7.1	H	7.1	2	300	
	Camera	Daq Timing		seperation between pulses (ns)				CCPG pattern start	CCPG pattern stop	w
1	H	0	0	300000	300060	60	X=gone	2	-3.00	
2	F1	1000	1000	301000	301060	60	X=gone	3	-2.00	
3	K	2000	1000	302000	302060	60		4	-1.00	
4	G1	3000	1000	303000	303060	60	X=gone	5	0.00	
5	N	4000	1000	304000	304060	60		6	1.00	
6	F2	5000	1000	305000	305060	60		7	2.00	
7	Q	6000	1000	306000	306060	60	X=gone	8	3.00	
8	G2	7000	1000	307000	307060	60		9	4.00	
9	A	8000	1000	308000	308060	60	X=gone	10	5.00	
10	T	9000	1000	309000	309060	60		11	6.00	
11	F3	10000	1000	310000	310060	60	X=gone	12	7.00	
12	X	11000	1000	311000	311060	60		13	8.00	
13	G3	12000	1000	312000	312060	60	X=gone	14	9.00	
14	I	13000	1000	313000	313060	60		15	10.00	
15	F4	14000	1000	314000	314060	60		16	11.00	
16	B	15000	1000	315000	315060	60		17	12.00	
17	L	16000	1000	316000	316060	60	X=gone	18	13.00	
18	G4	17000	1000	317000	317060	60	X=gone	19	14.00	
19	O	18000	1000	318000	318060	60		20	15.00	
20	F5	19000	1000	319000	319060	60		21	16.00	
21	R	20000	1000	320000	320060	60		22	17.00	
22	G5	21000	1000	321000	321060	60		23	18.00	
23	C	22000	1000	322000	322060	60	X=gone	24	19.00	
24	U	23000	1000	323000	323060	60	X=gone	25	20.00	
25	F6	24000	1000	324000	324060	60	X=gone	26	21.00	
26	Y	25000	1000	325000	325060	60		27	22.00	
27	G6	26000	1000	326000	326060	60	X=gone	28	23.00	
28	J	27000	1000	327000	327060	60		29	24.00	
29	F7	28000	1000	328000	328060	60		30	25.00	
30	D	29000	1000	329000	329060	60		31	26.00	
31	M	30000	1000	330000	330060	60		32	27.00	
32	G7	31000	1000	331000	331060	60		33	28.00	
33	P	32000	1000	332000	332060	60	X=gone	34	29.00	
34	F8	33000	1000	333000	333060	60		35	30.00	
35	S	34000	1000	334000	334060	60		36	31.00	
36	G8	35000	1000	335000	335060	60		37	32.00	
37	E	36000	1000	336000	336060	60	X=gone	38	33.00	
38	V	37000	1000	337000	337060	60		39	34.00	
39	F9	38000	1000	338000	338060	60	X=gone	40	35.00	
40	Z	39000	1000	339000	339060	60	X=gone	41	36.00	
41	G9	40000	1000	340000	340060	60	X=gone	42	37.00	

File uploaded: ***Prad367.xls*** of type ***application/vnd.ms-excel***

Click to open uploaded file

Basic Filters	Content Filters
By Date	Date Range Start 7/27/2009 / 7/28/2009 End
Last 10	Name ASaunders
Today	Text Entry Ex: "camera"
This Week	Activity No PRAD0367 - Detonator Test - Magic Cone Test
This Month	Expt Family Miscellaneous
This Year	Pic Type Other
All	Run No Pic No

Check checkboxes to select content filters ("" . * . ? chars allowed).

Refresh | Hide Filters | New Entry

PRAD Home > Logbook Home

PRAD On-Line | Logbook | PRAD Off-Line | Run Status | Beam Status | Phone

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Summary of Run 36419, 4:03:48 PM, Monday, June 22, 2009

Batch Protons

	Group 1	
	N	Integral
Trigger 1	42	1.47338E+11
Run 36419	42	1.47338E+11
Batch started at 36419	42	1.47338E+11

Total Protons

RUN	Time	N	Group 1
36419	16:03 06/22/09	42	1.47338E+11

Protons per Peak

Run	Scope	Channel	# Peaks	Sum V-S	Sum P	Peak	Time	Peak V-S	Peak P	Rel Error
36419	9	2	42	5.78024E-06	1.47338E+11					
						1	-9.74637E-09	9.77160E-08	2.49078E+09	2.02751E-02
						2	2.49999E-04	1.37531E-07	3.50567E+09	1.62910E-02
						3	2.50996E-04	1.35783E-07	3.46110E+09	1.65007E-02
						4	2.51996E-04	1.41631E-07	3.61017E+09	1.58194E-02
						5	2.52995E-04	1.43487E-07	3.65749E+09	1.59760E-02

						6	2.53994 E-04	1.41239 E-07	3.60019E +09	1.62303 E-02
						7	2.54992 E-04	1.44961 E-07	3.69506E +09	1.58136 E-02
						8	2.55991 E-04	1.37843 E-07	3.51362E +09	1.66302 E-02
						9	2.56989 E-04	1.39271 E-07	3.55001E +09	1.60875 E-02
						10	2.57989 E-04	1.34437 E-07	3.42679E +09	1.66660 E-02
						11	2.58986 E-04	1.35417 E-07	3.45177E +09	1.69282 E-02
						12	2.59986 E-04	1.35414 E-07	3.45170E +09	1.65457 E-02
						13	2.60985 E-04	1.39877 E-07	3.56546E +09	1.60178 E-02
						14	2.61984 E-04	1.40033 E-07	3.56944E +09	1.63701 E-02
						15	2.62982 E-04	1.45703 E-07	3.71397E +09	1.57331 E-02
						16	2.63981 E-04	1.39968 E-07	3.56779E +09	1.60073 E-02
						17	2.64980 E-04	1.42986 E-07	3.64470E +09	1.56695 E-02
						18	2.65978 E-04	1.37385 E-07	3.50194E +09	1.66857 E-02
						19	2.66976 E-04	1.33716 E-07	3.40842E +09	1.67558 E-02
						20	2.67976 E-04	1.37237 E-07	3.49816E +09	1.63259 E-02
						21	2.68975 E-04	1.38966 E-07	3.54225E +09	1.61228 E-02
						22	2.69974 E-04	1.38589 E-07	3.53265E +09	1.61666 E-02
						23	2.70973 E-04	1.41042 E-07	3.59517E +09	1.58854 E-02
						24	2.71970 E-04	1.32135 E-07	3.36811E +09	1.69563 E-02
						25	2.72970 E-04	1.35794 E-07	3.46139E +09	1.61176 E-02

						26	2.73968 E-04	1.44343 E-07	3.67929E +09	1.55222 E-02
						27	2.74968 E-04	1.40225 E-07	3.57433E +09	1.67173 E-02
						28	2.75966 E-04	1.36297 E-07	3.47422E +09	1.64384 E-02
						29	2.76964 E-04	1.36052 E-07	3.46797E +09	1.64681 E-02
						30	2.77964 E-04	1.35096 E-07	3.44360E +09	1.69683 E-02
						31	2.78963 E-04	1.38317 E-07	3.52571E +09	1.61984 E-02
						32	2.79962 E-04	1.42774 E-07	3.63930E +09	1.56928 E-02
						33	2.80960 E-04	1.41675 E-07	3.61131E +09	1.54485 E-02
						34	2.81958 E-04	1.38292 E-07	3.52505E +09	1.62014 E-02
						35	2.82957 E-04	1.40011 E-07	3.56887E +09	1.63727 E-02
						36	2.83956 E-04	1.35796 E-07	3.46143E +09	1.64992 E-02
						37	2.84954 E-04	1.38876 E-07	3.53994E +09	1.61333 E-02
						38	2.85953 E-04	1.37817 E-07	3.51295E +09	1.62572 E-02
						39	2.86953 E-04	1.35730 E-07	3.45975E +09	1.65072 E-02
						40	2.87951 E-04	1.33114 E-07	3.39309E +09	1.68315 E-02
						41	2.88950 E-04	1.39753 E-07	3.56231E +09	1.64029 E-02
						42	2.89948 E-04	1.37911 E-07	3.51536E +09	1.62461 E-02

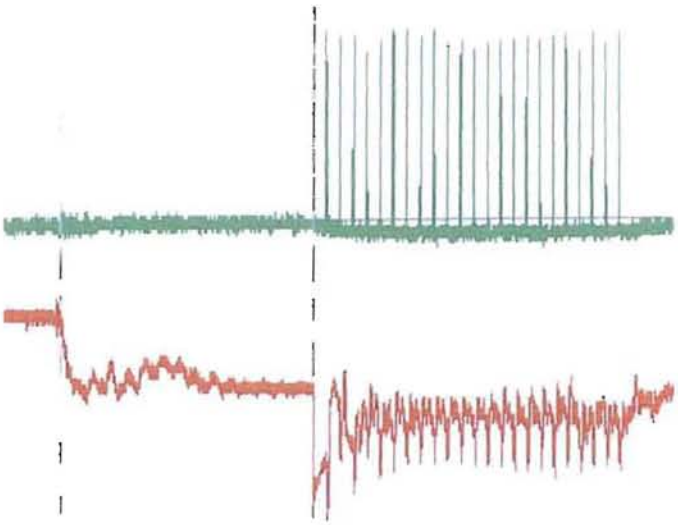
DG535 Timing

Run	DG	A Delay	B Delay	C Delay	D Delay

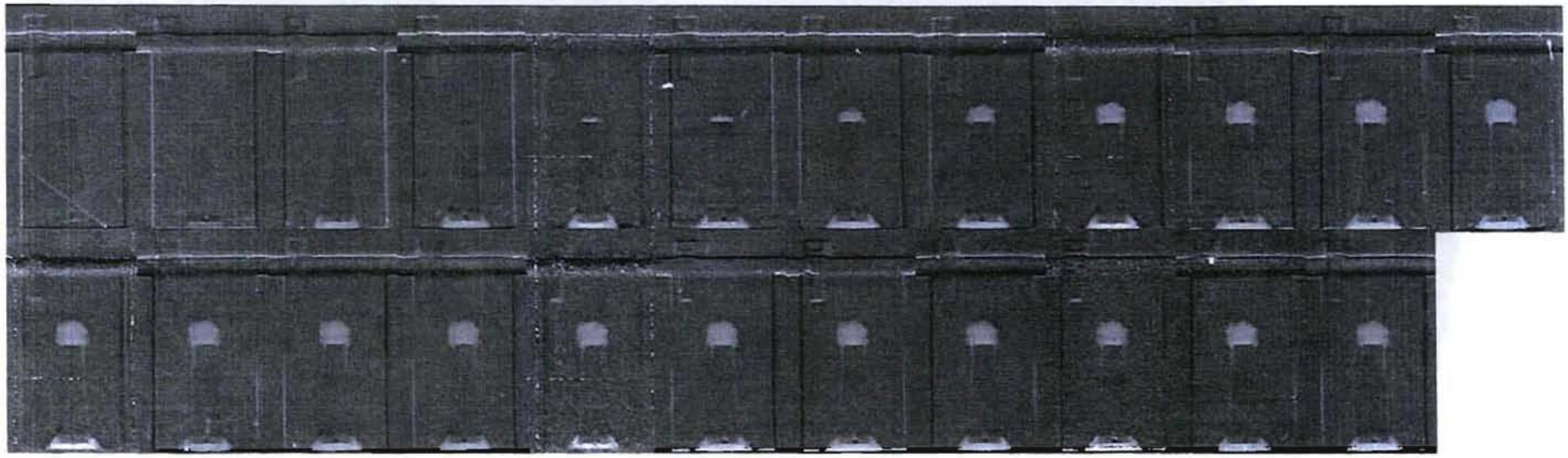
	Tag				
36419	8	2.571200000000E-02	3.000000000000E-04	5.000000000000E-03	0.500000000000
36419	9	5.100000000000E-03	1.000000000000E-04	5.150000000000E-03	5.000000000000E-08
36419	10	4.000000000000E-05	4.500000000000E-05	5.000000000000E-05	6.000000000000E-08
36419	11	1.995120000000E-04	5.000000000000E-05	0.00000000000	2.000000000000E-09
36419	13	2.500000000000E-02	5.000000000000E-07	0.00000000000	1.010000000000E-04
36419	14	5.000000000000E-12	1.300000000000E-05	5.000000000000E-12	5.000000000000E-12
36419	16	2.460000000000E-04	2.000000000000E-07	1.521500000000E-05	5.000000000000E-06
36419	23	9.100000000000E-06	3.000000000000E-04	6.750000000000E-07	1.000000000000E-06

Camera Walk/Timing File

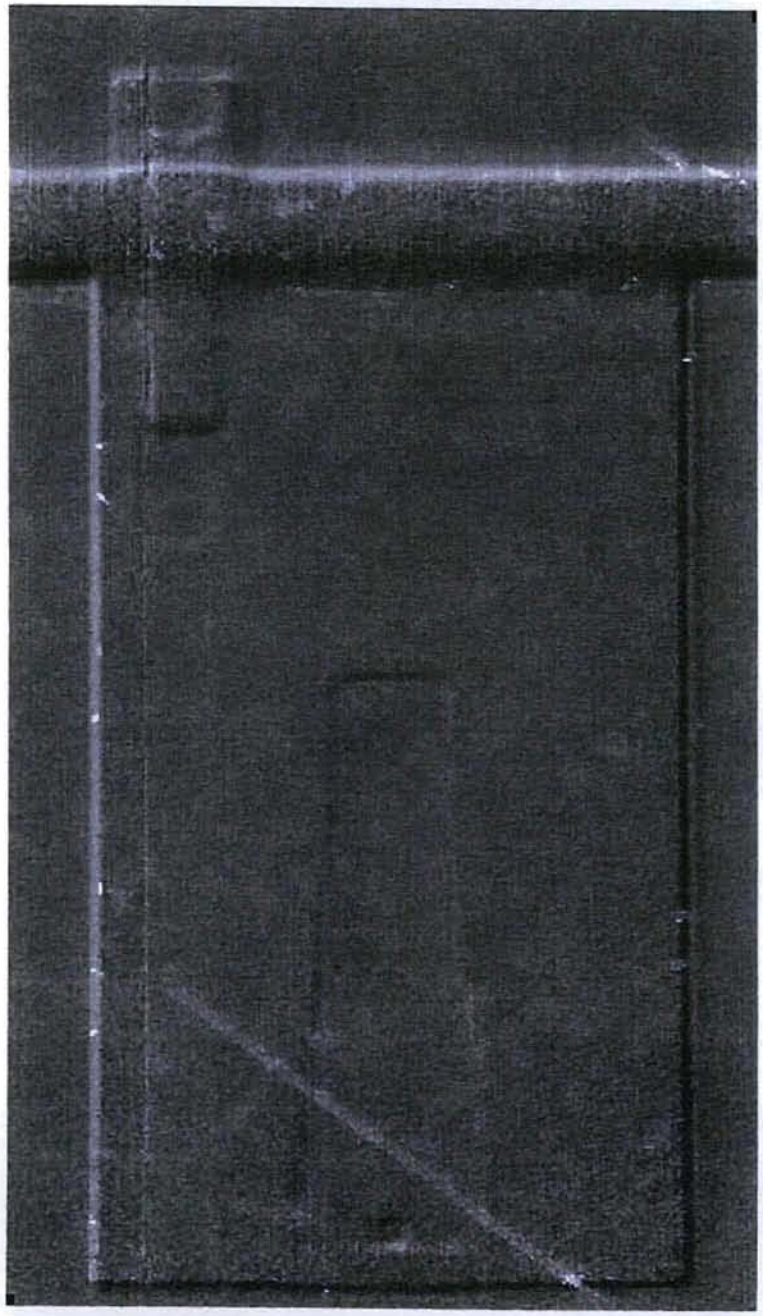
RUN	Time 1	Camera 1
36419	0.000	3.61645E-02,



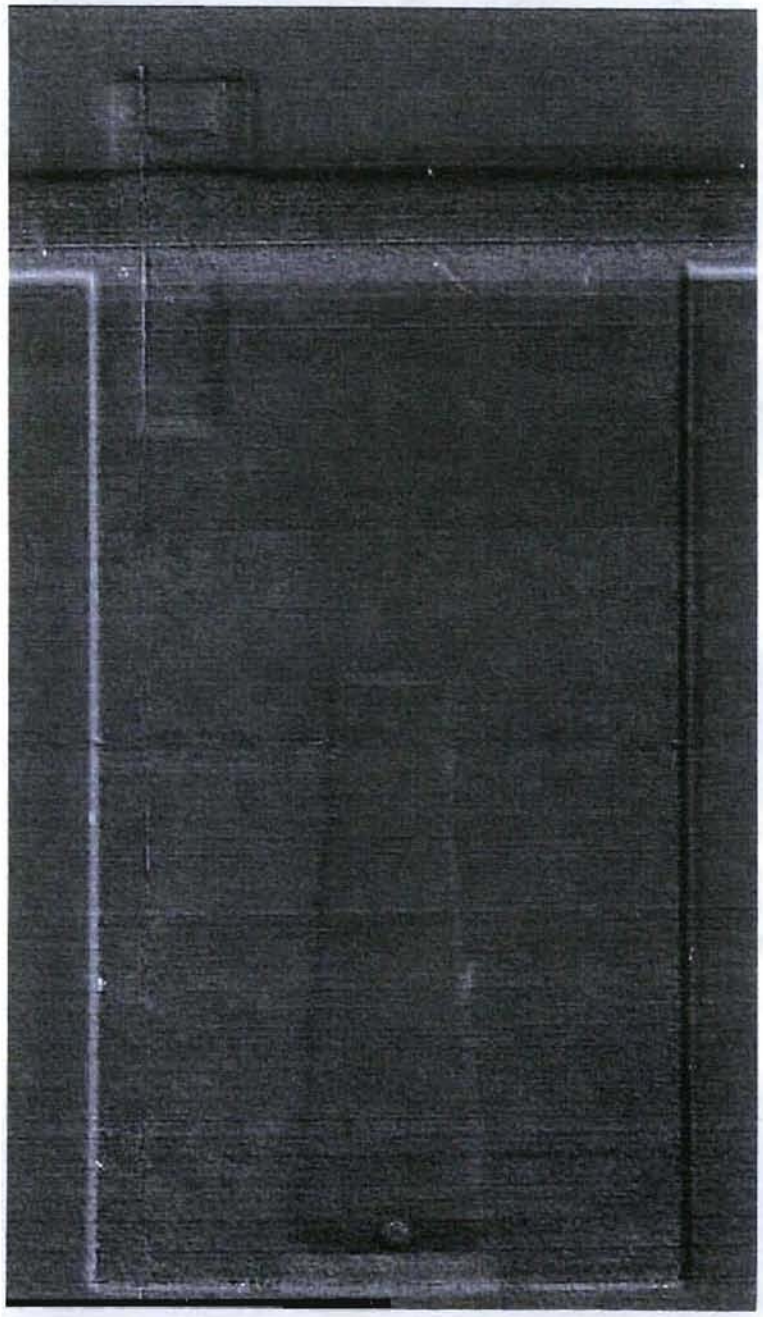
PRAD 0367: Magic Cone Detonator Test



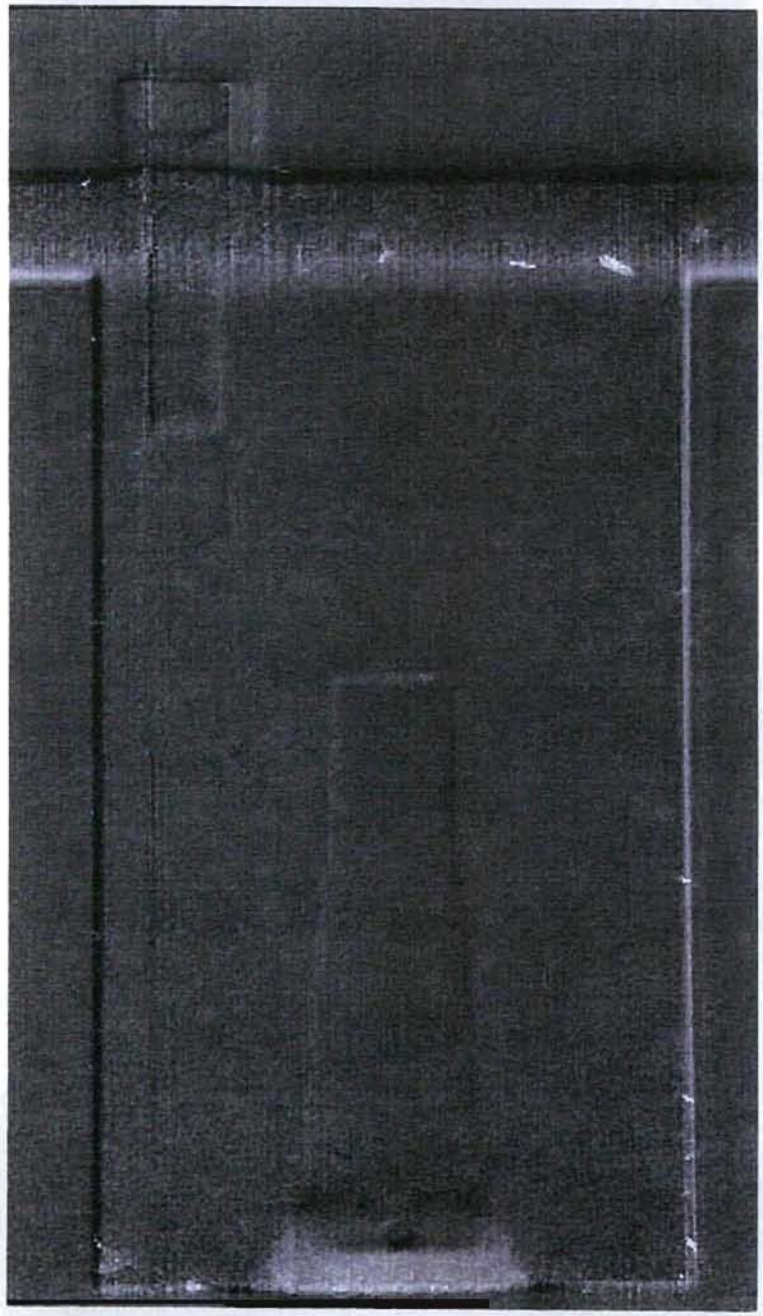
PRAD0367 00000 Camera H



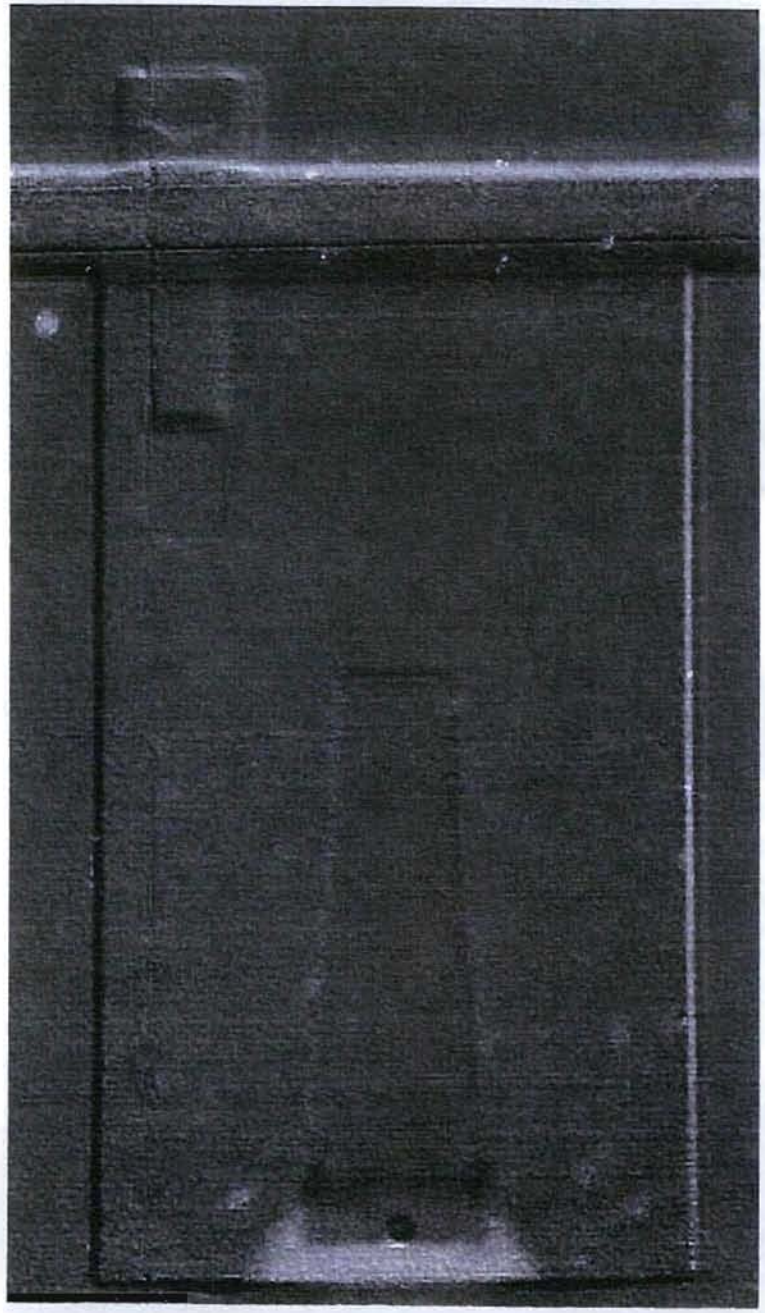
PRAD0367 02000 Camera K



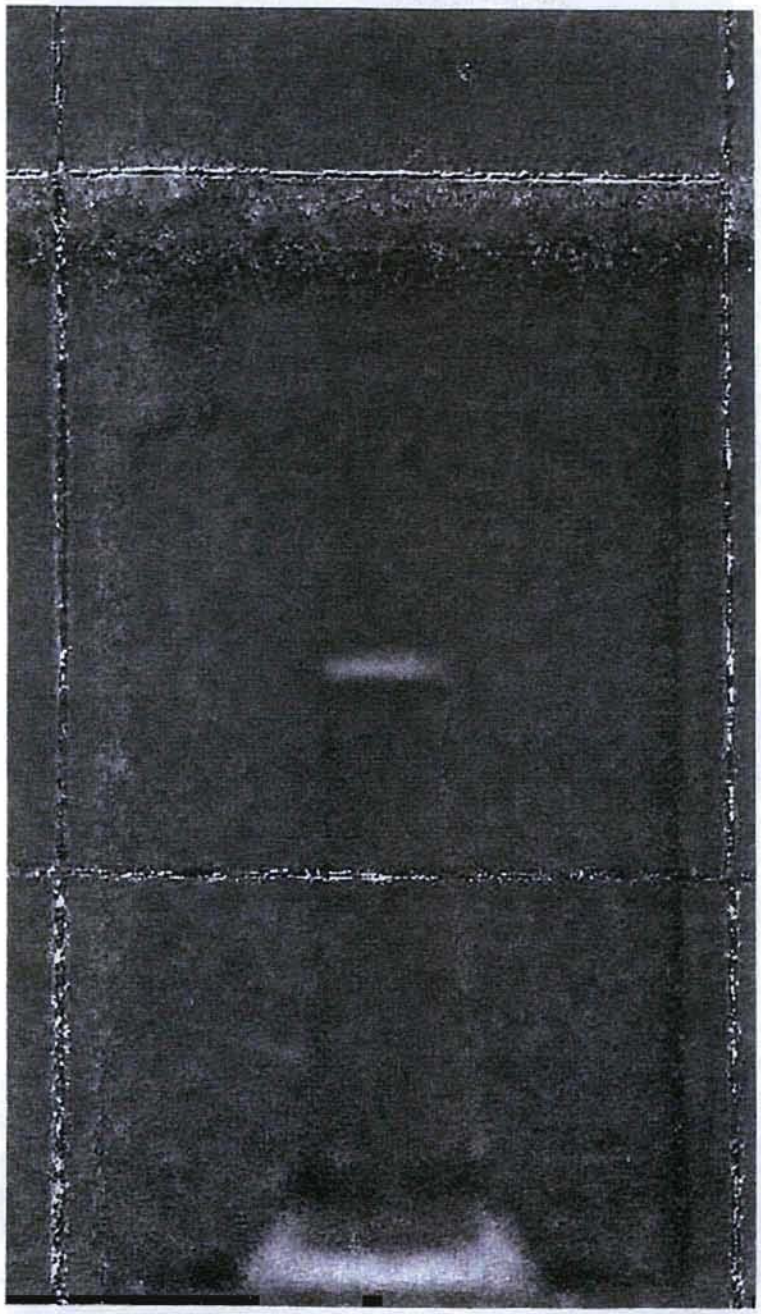
PRAD0367 04000 Camera N



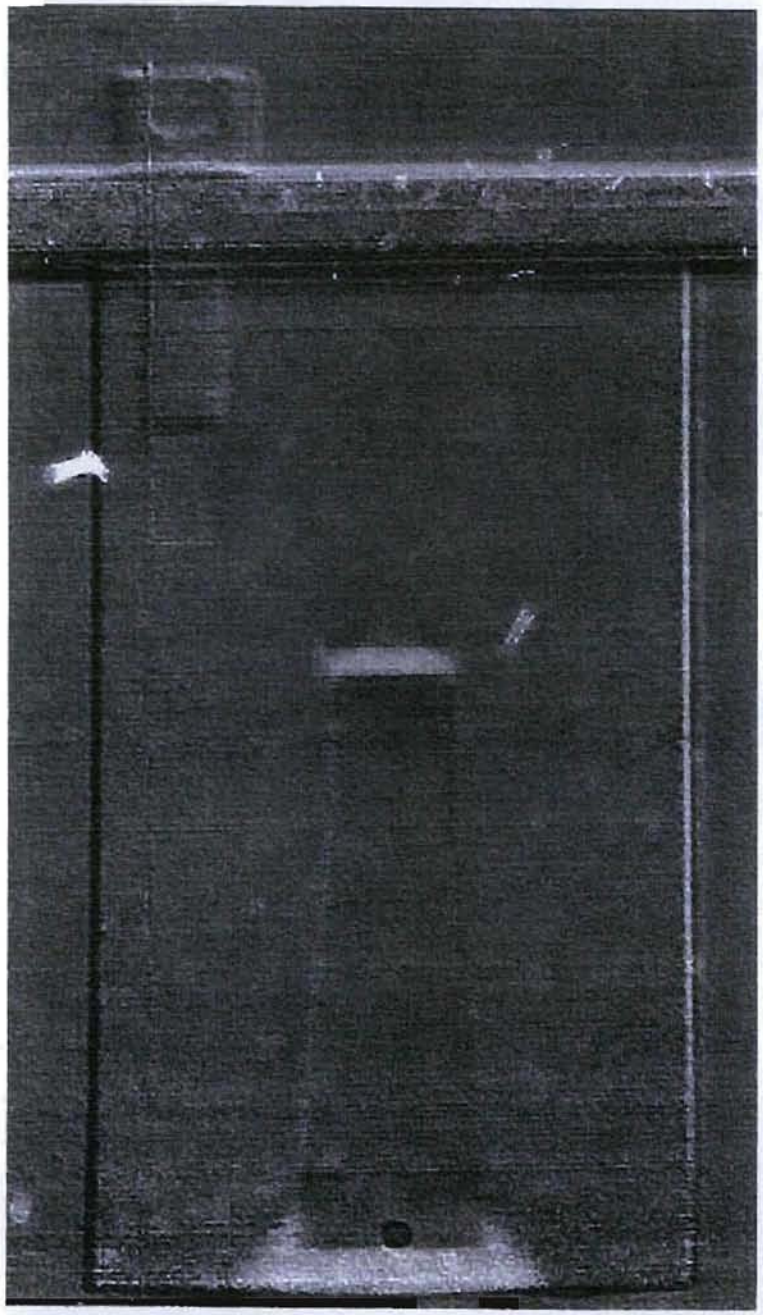
PRAD0367 06000 Camera Q



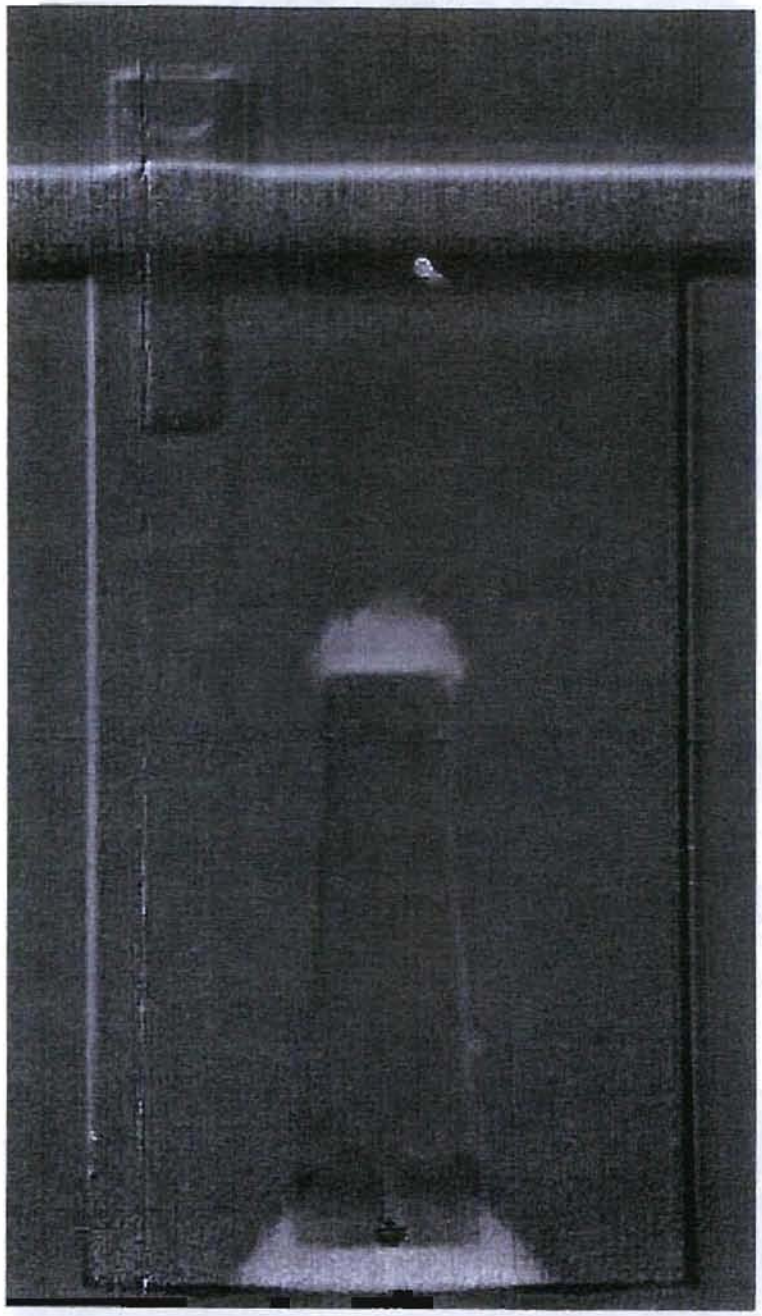
PRAD0367 08000 Camera A



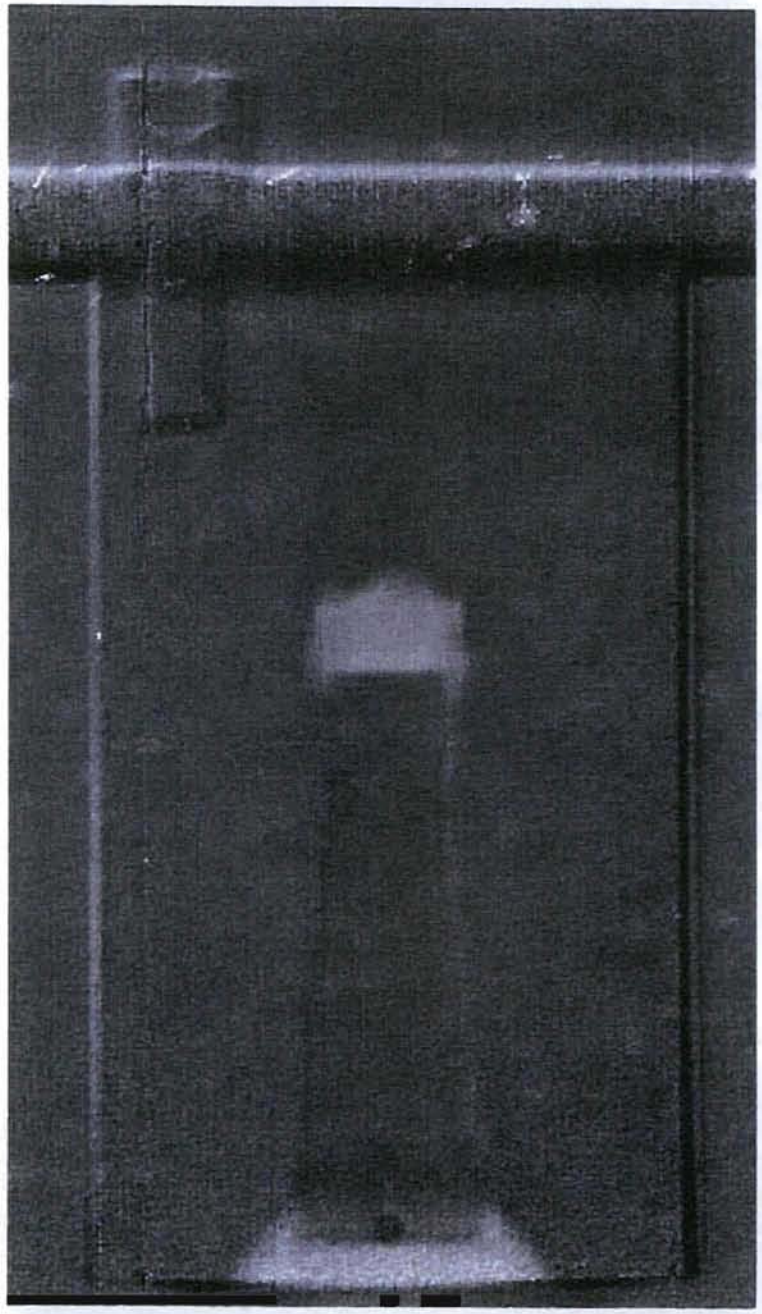
PRAD0367 09000 Camera T



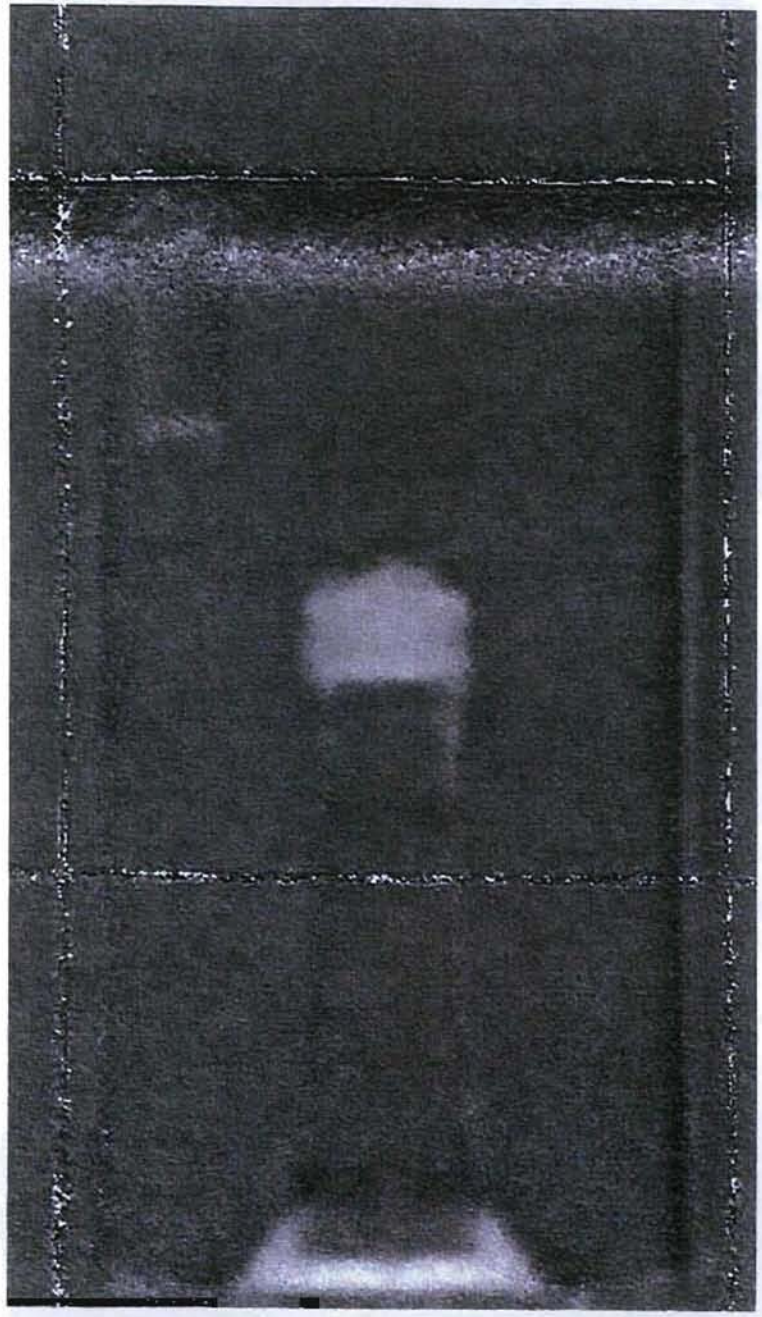
PRAD0367 11000 Camera X



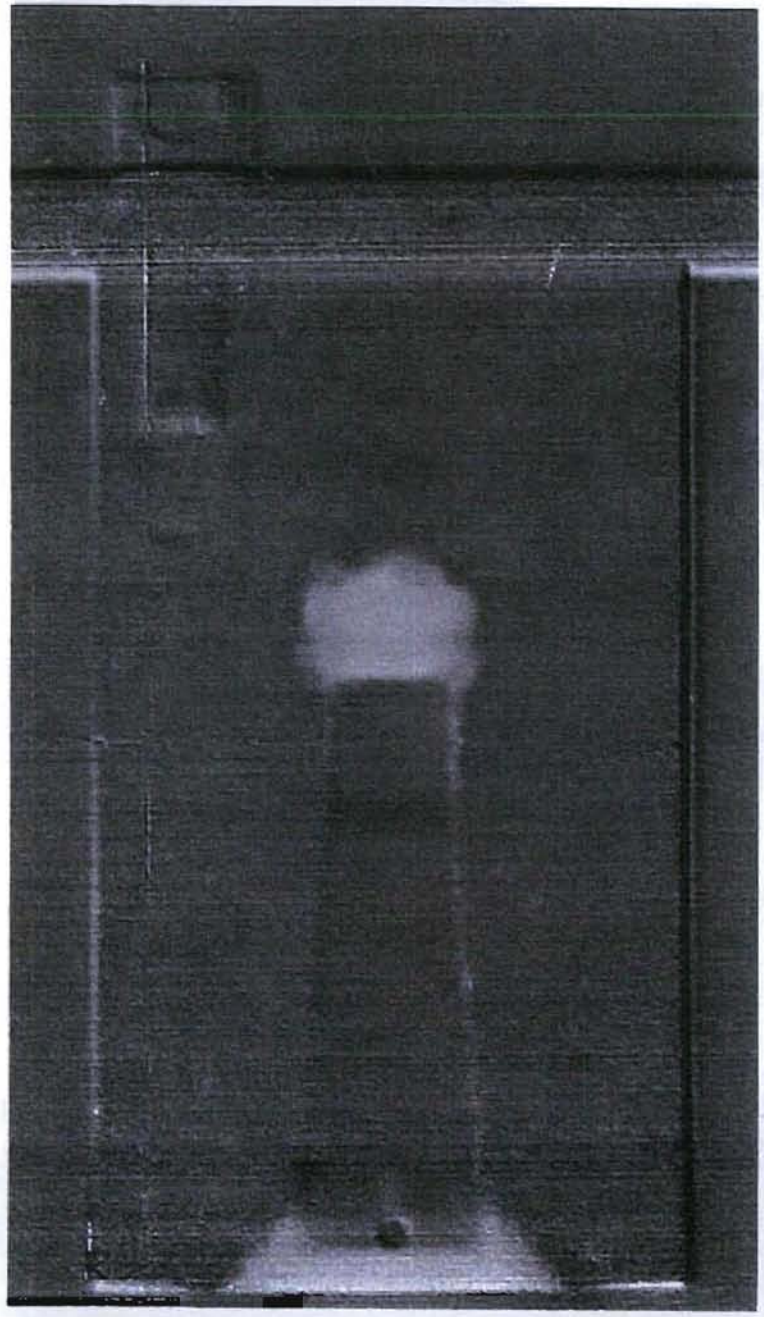
PRAD0367 13000 Camera I



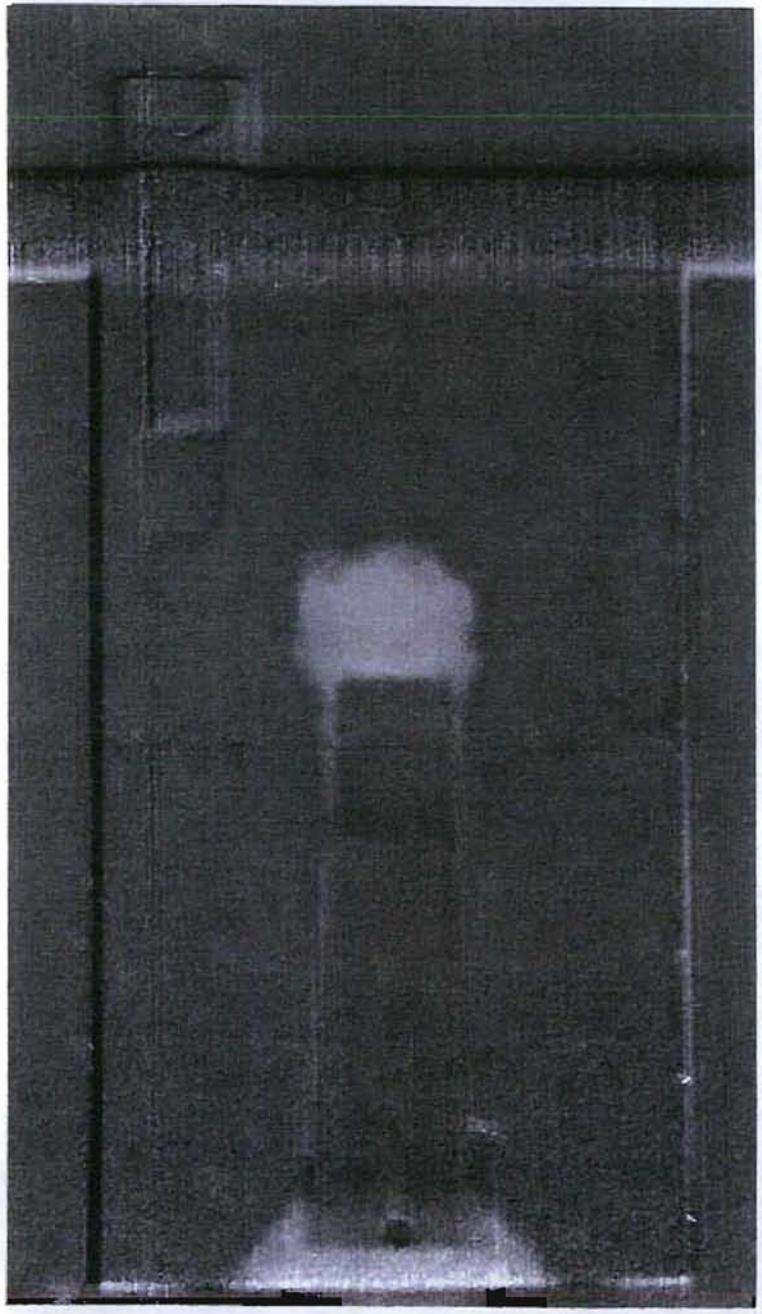
PRAD0367 15000 Camera B



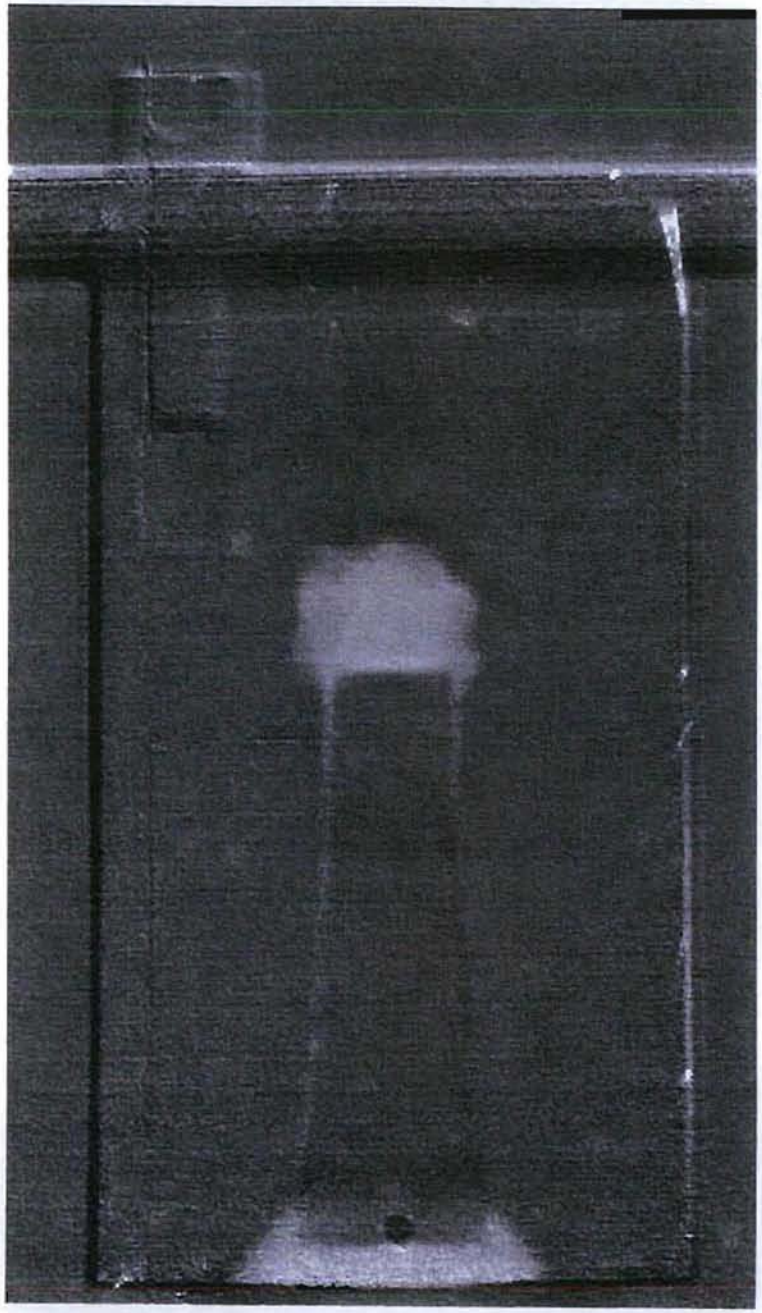
PRAD0367 16000 Camera L



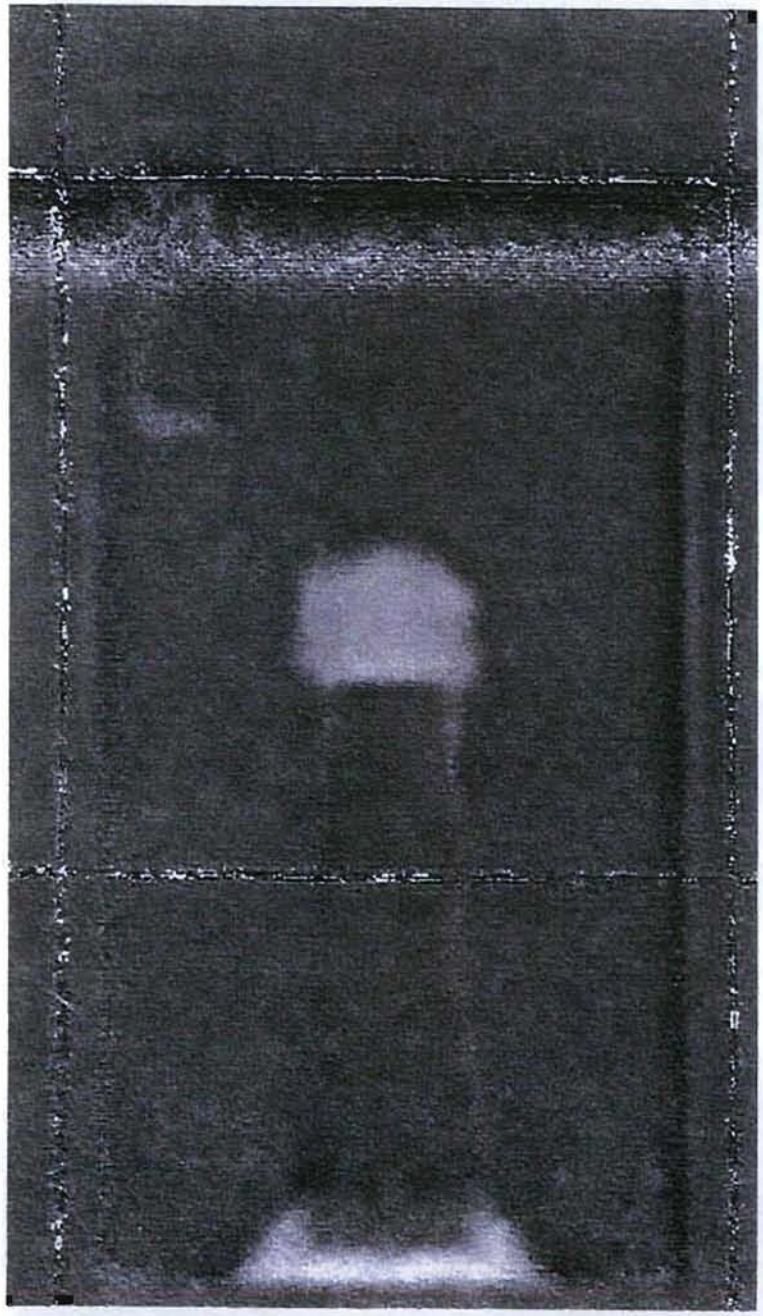
PRAD0367 18000 Camera O



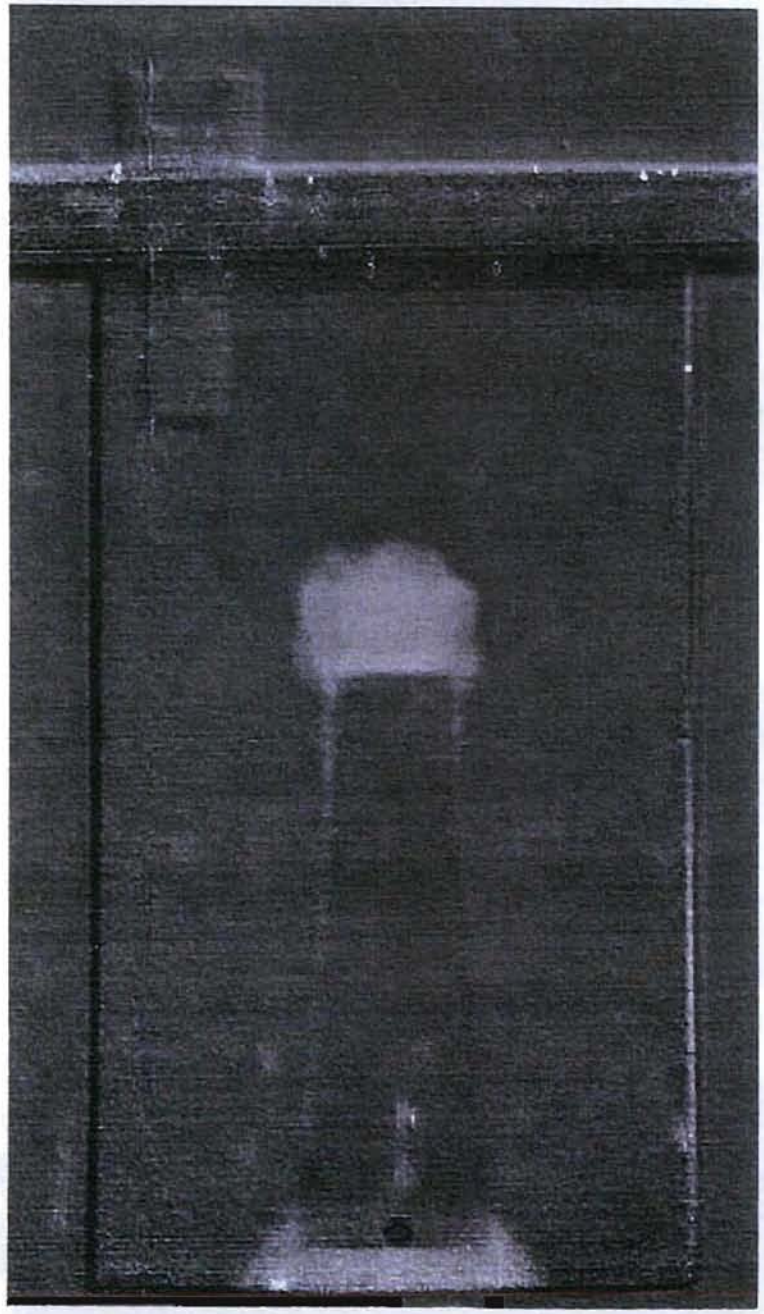
PRAD0367 20000 Camera R



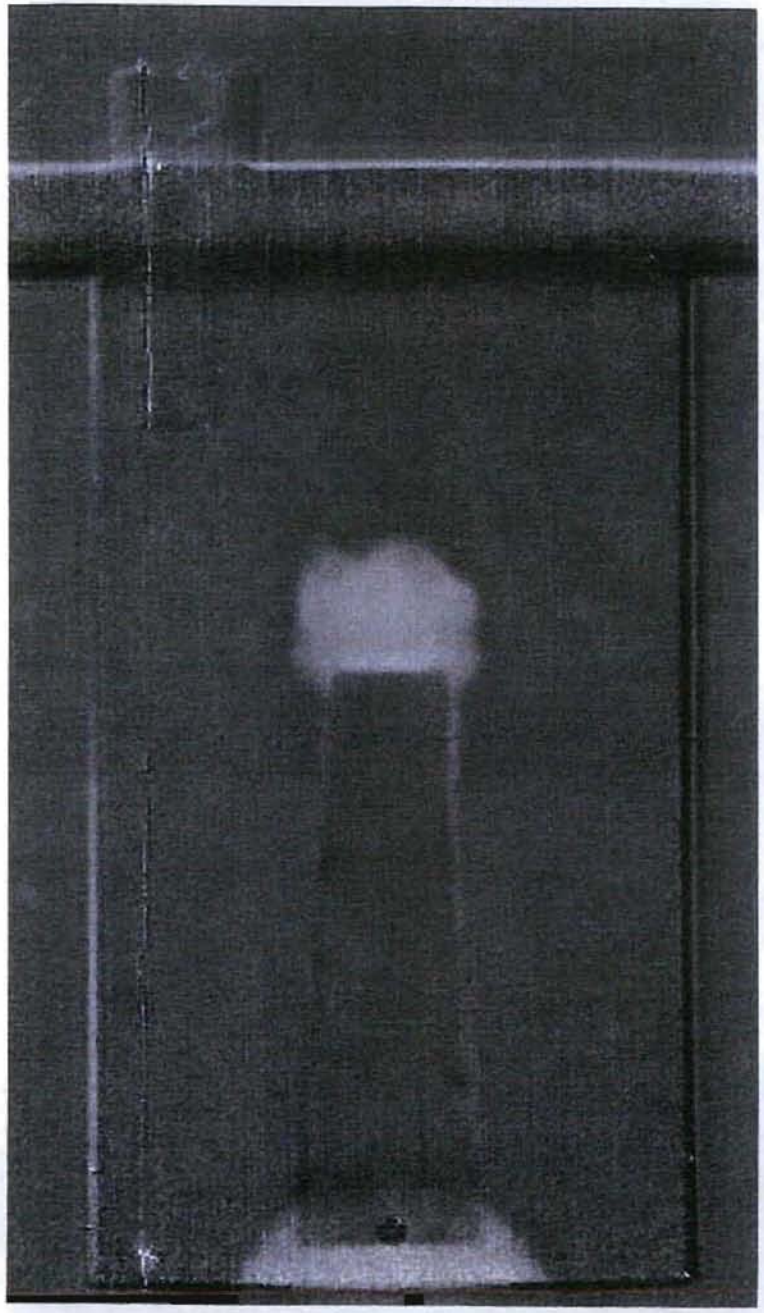
PRAD0367 22000 Camera C



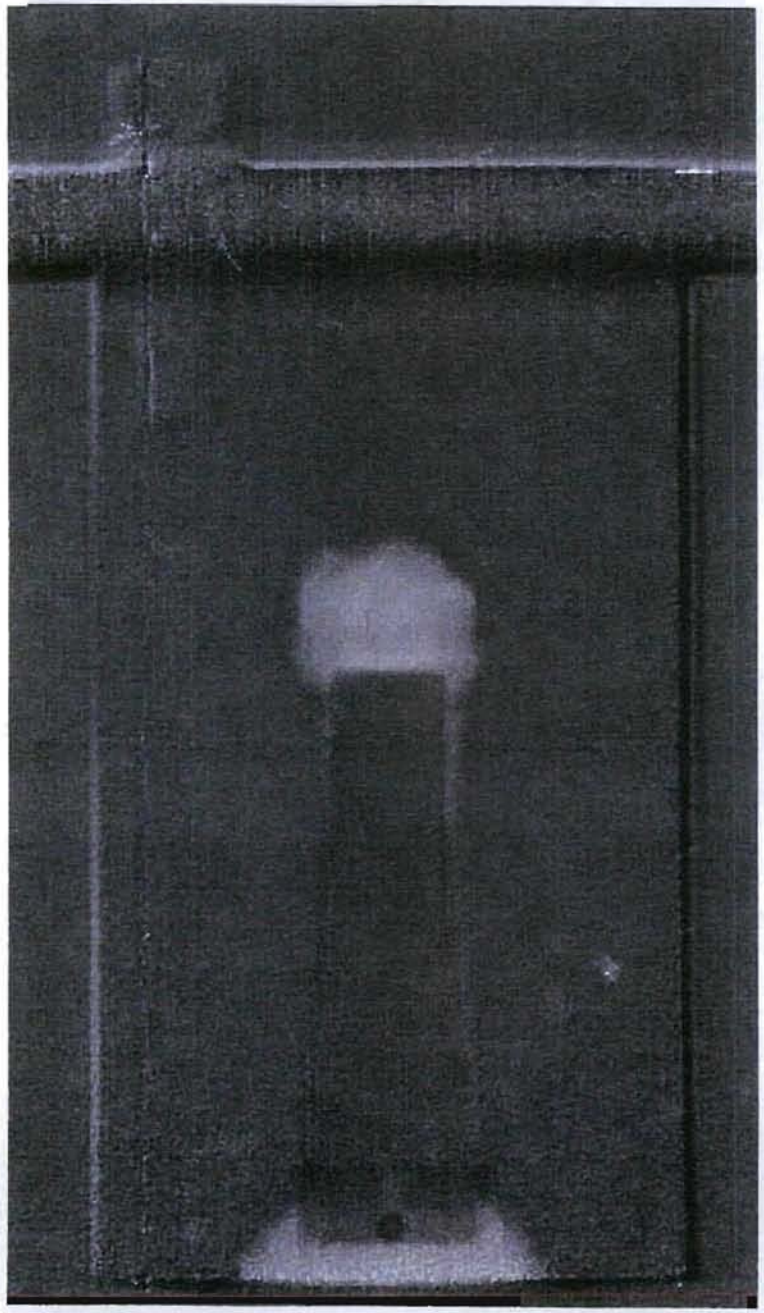
PRAD0367 23000 Camera U



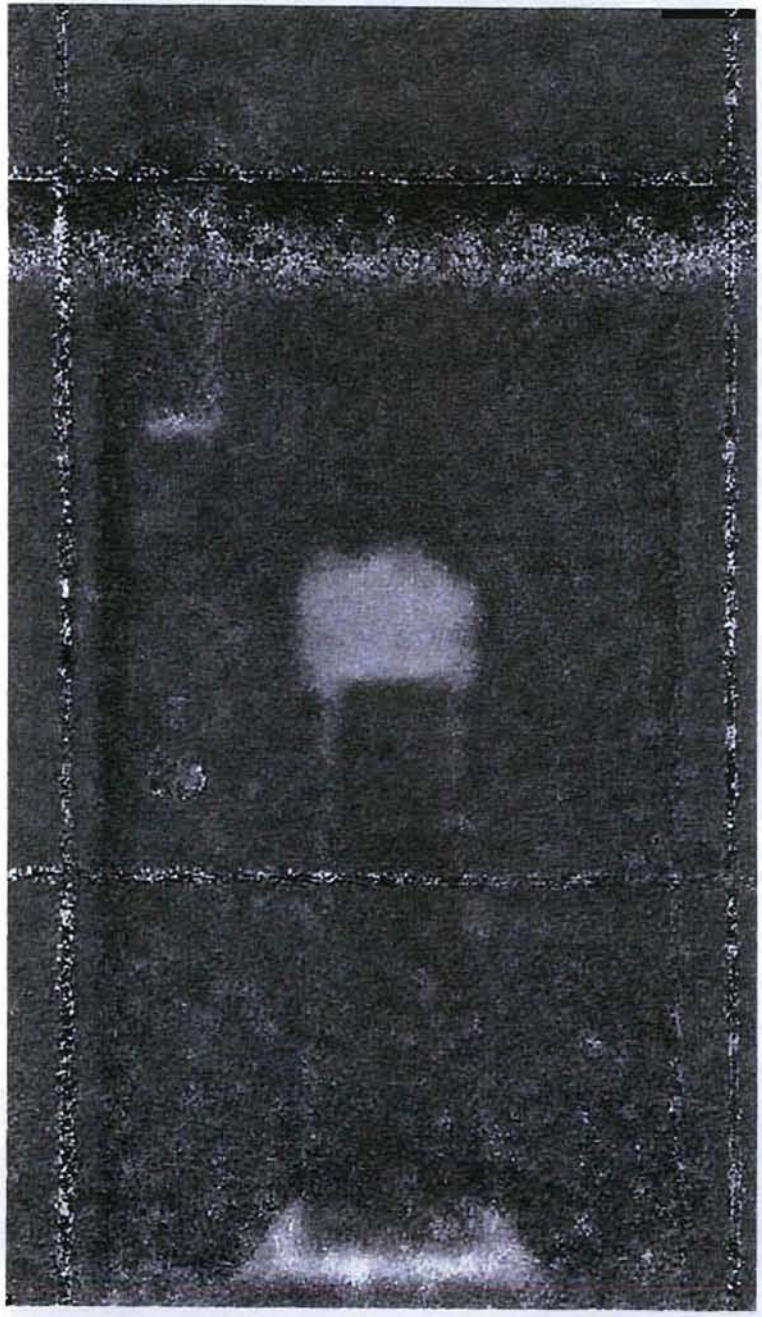
PRAD0367 25000 Camera Y



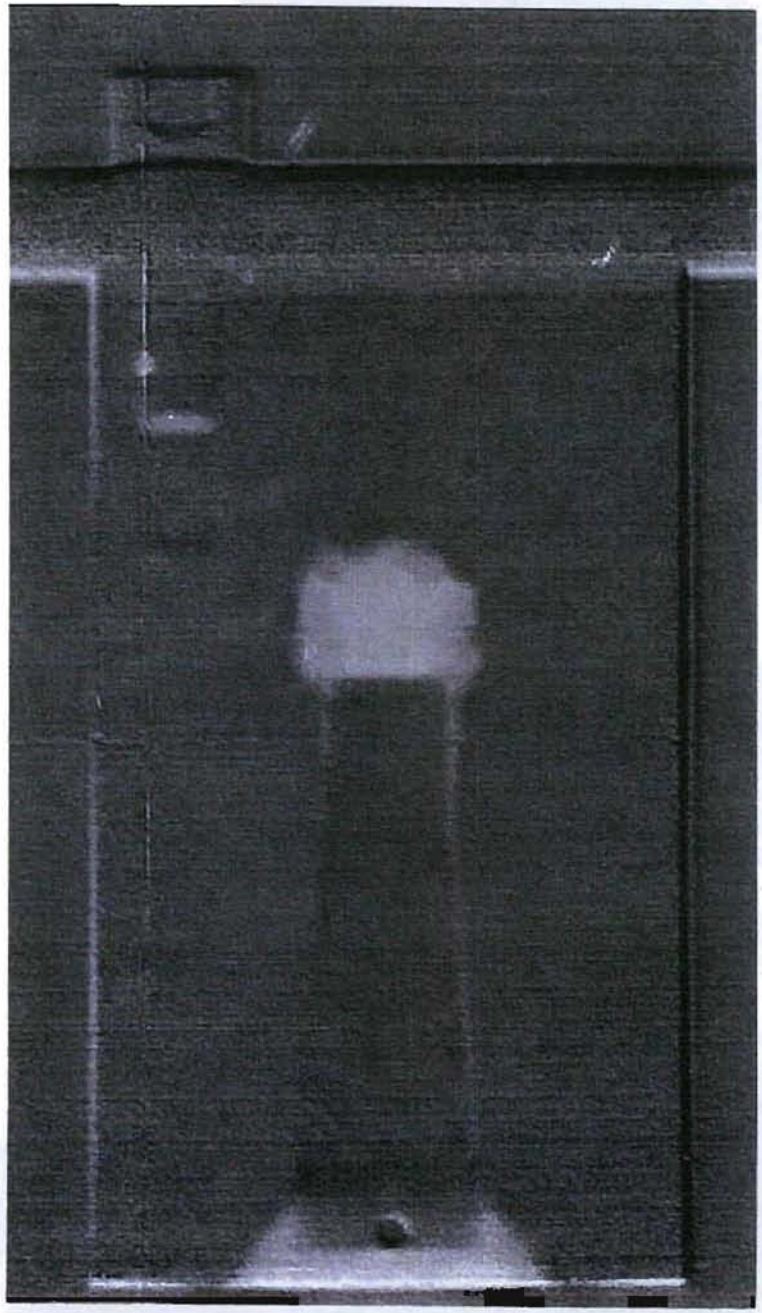
PRAD0367 27000 Camera J



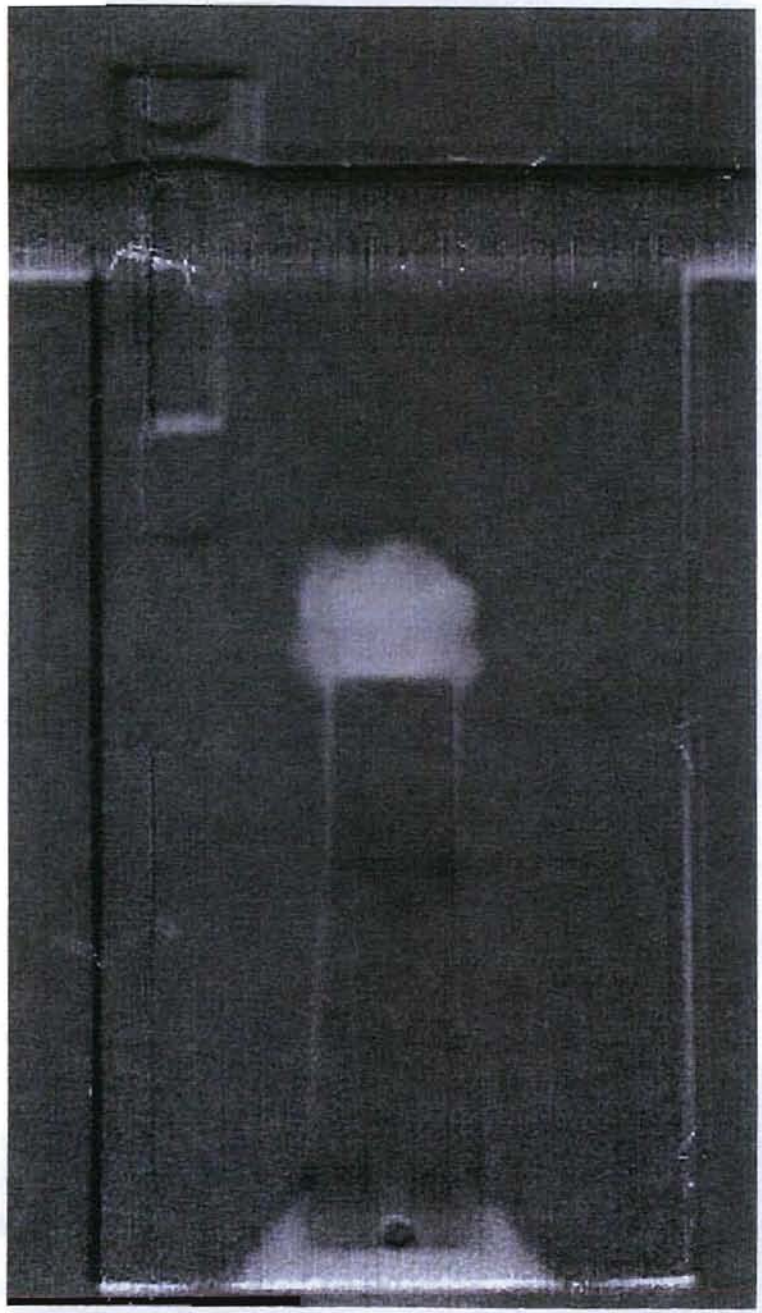
PRAD0367 29000 Camera D



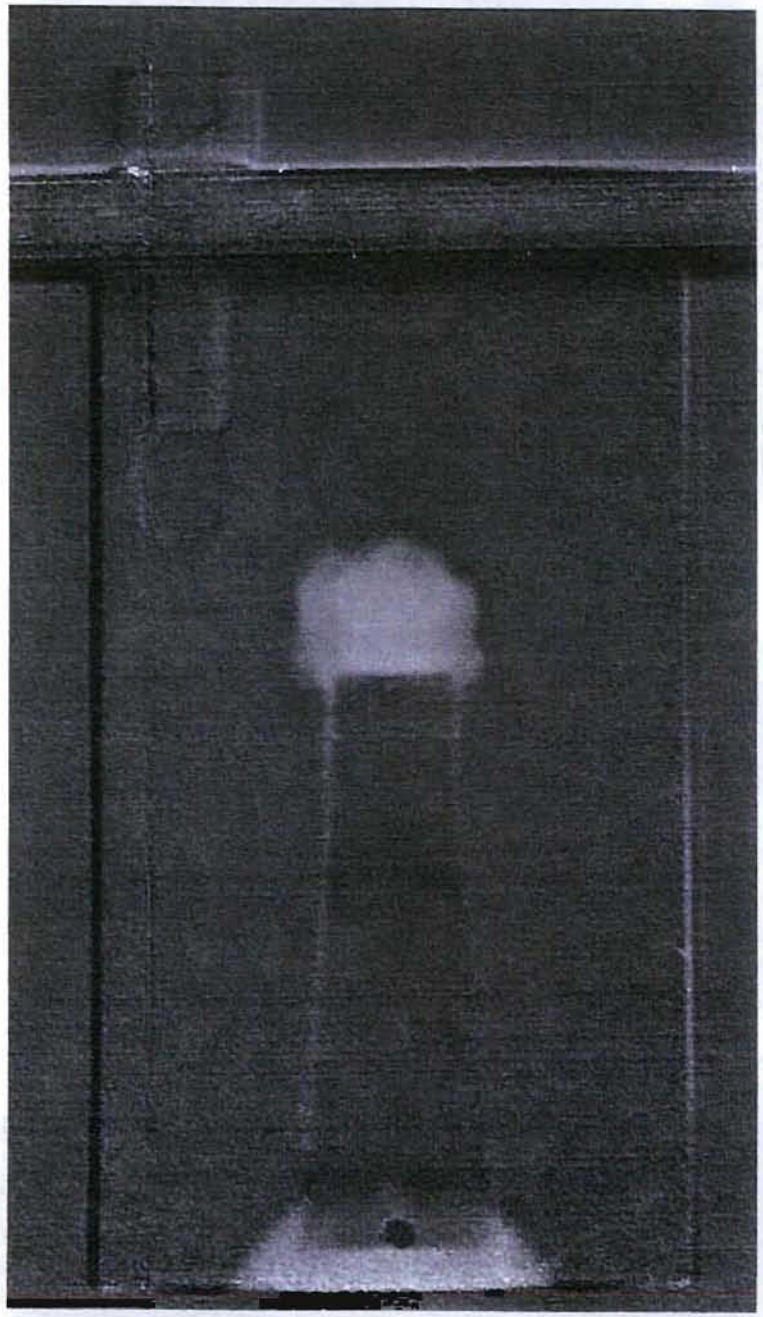
PRAD0367 30000 Camera M



PRAD0367 32000 Camera P

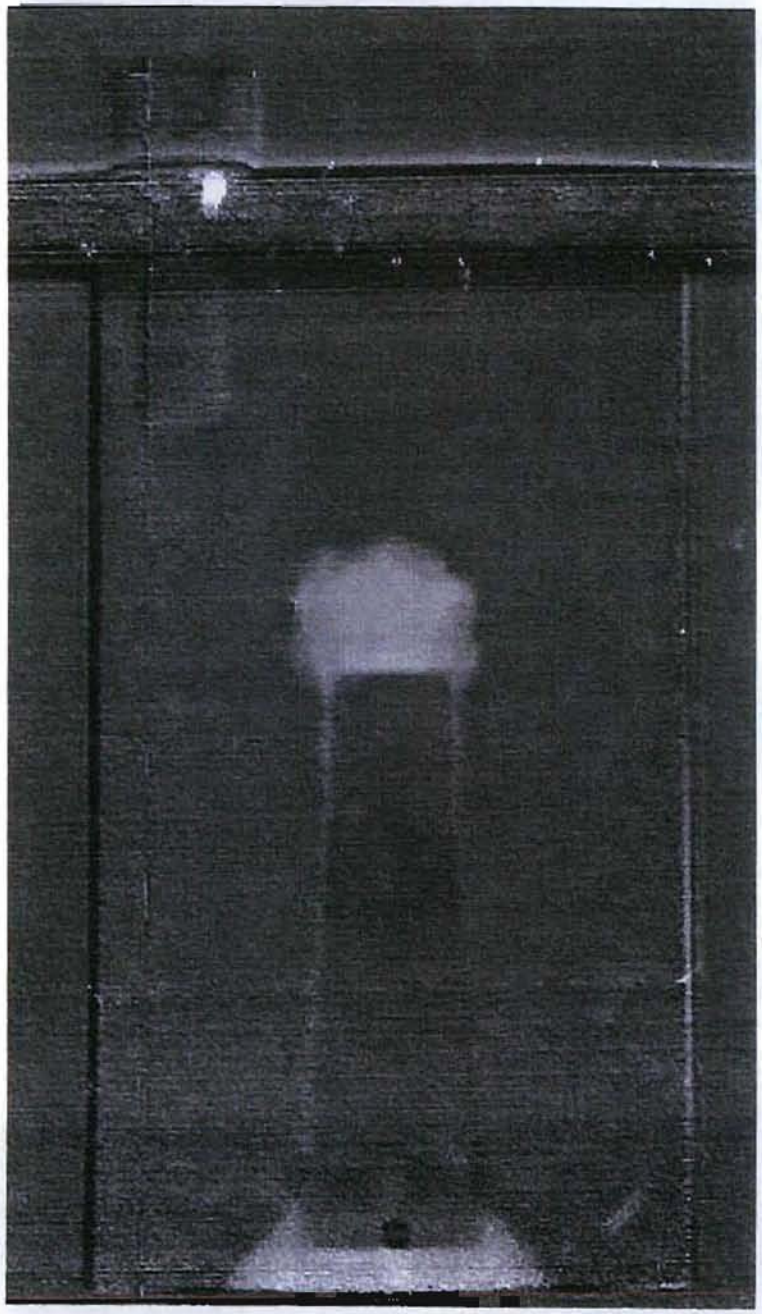


PRAD0367 34000 Camera S

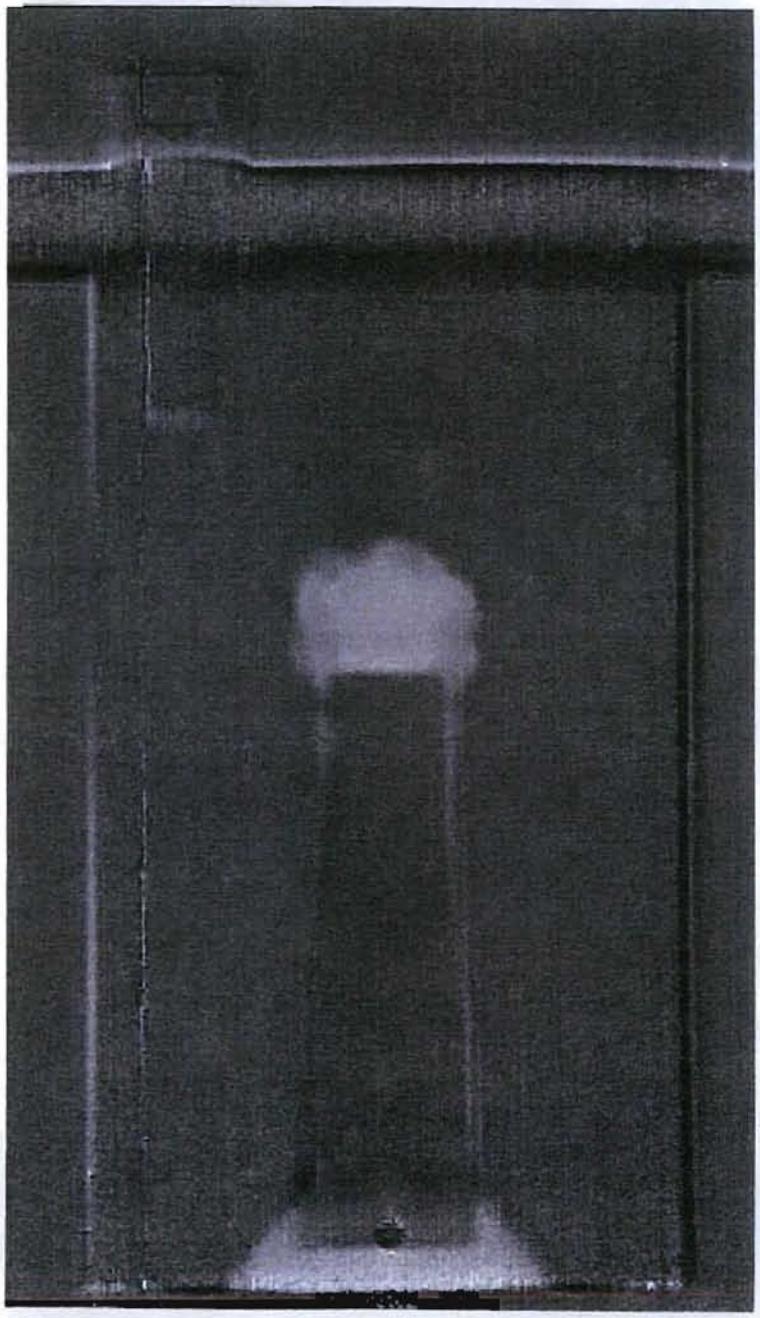


PRAD0367 36000 Camera E

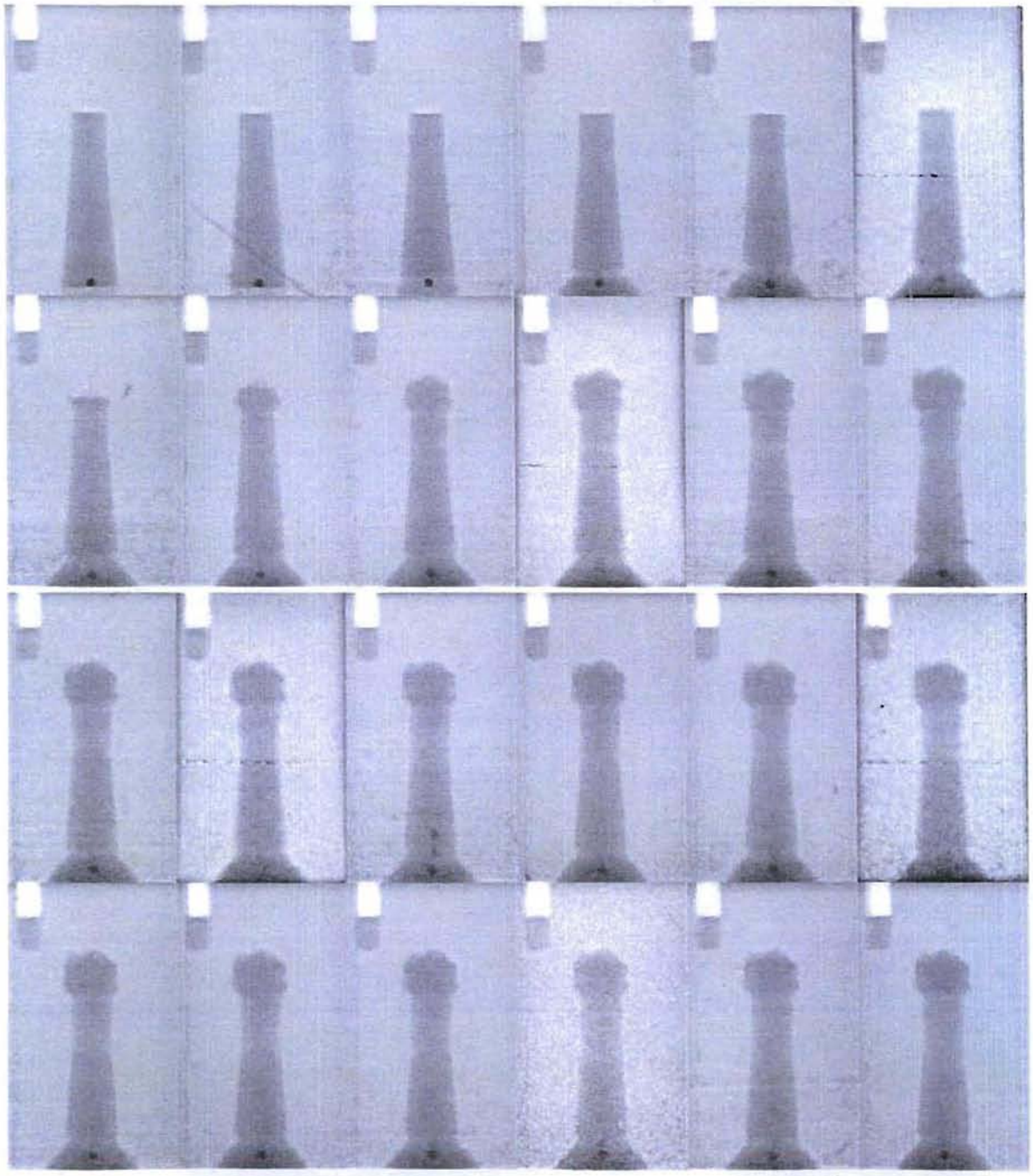
PRAD0367 37000 Camera V



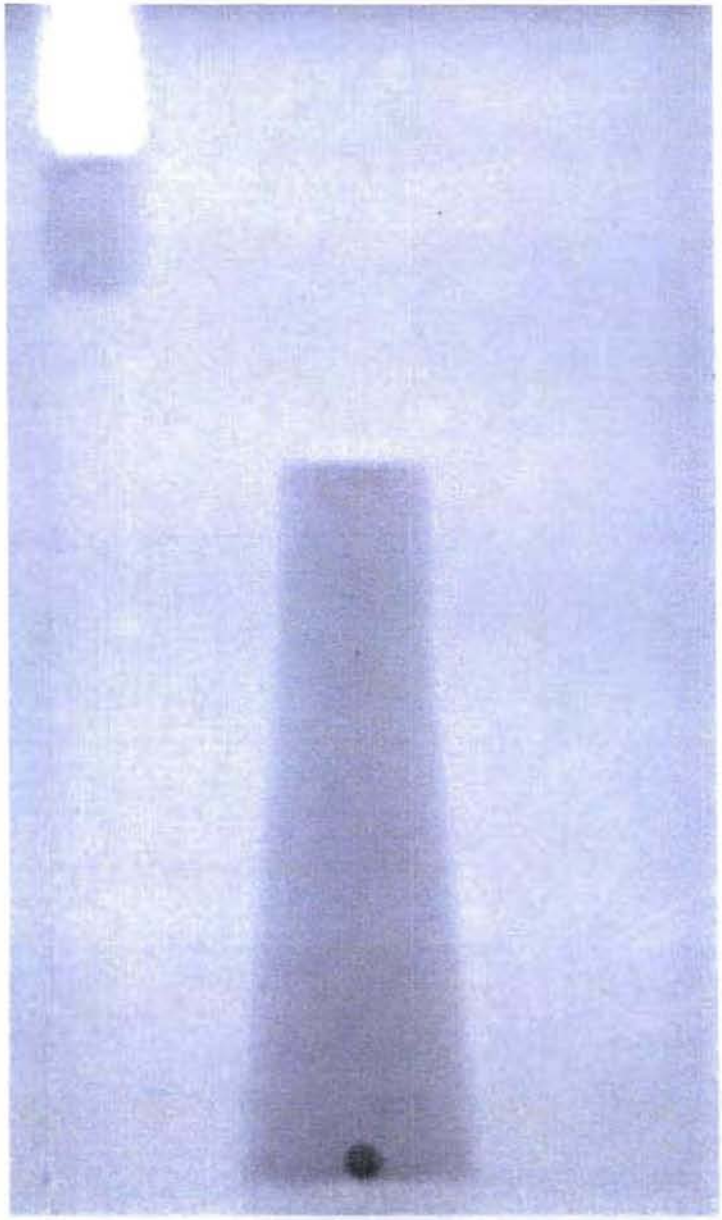
PRAD0367 39000 Camera Z



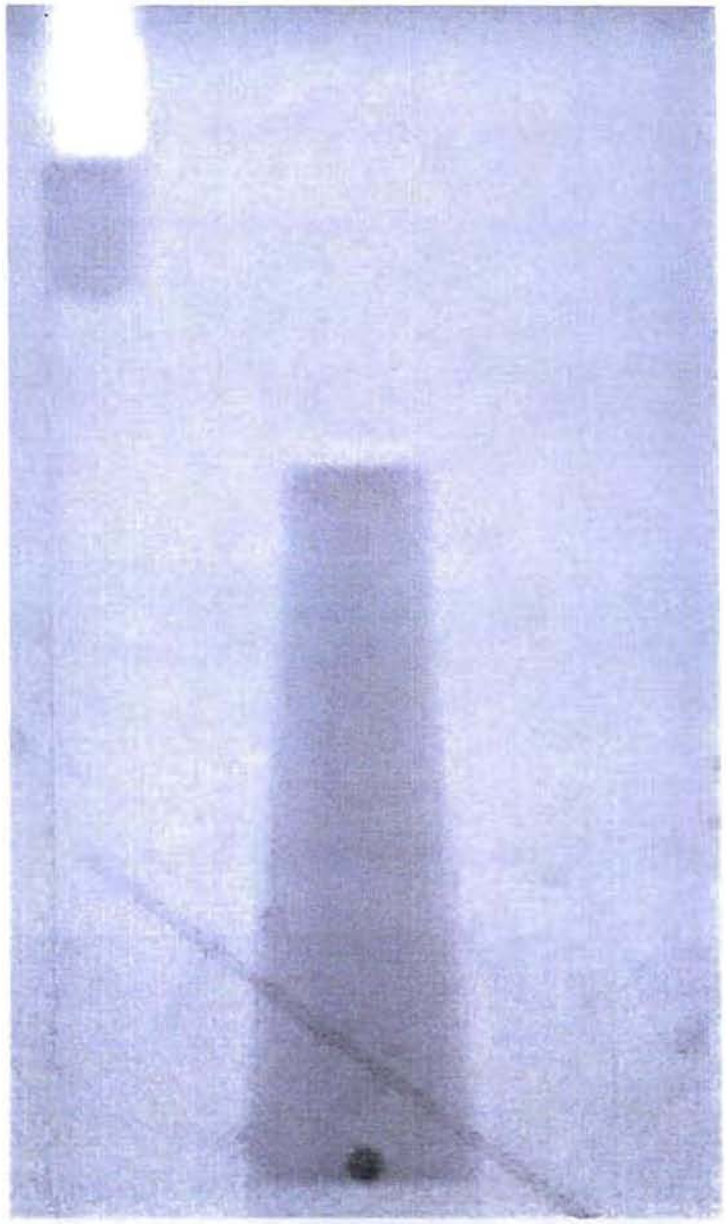
PRAD0367 Areal Density Composite



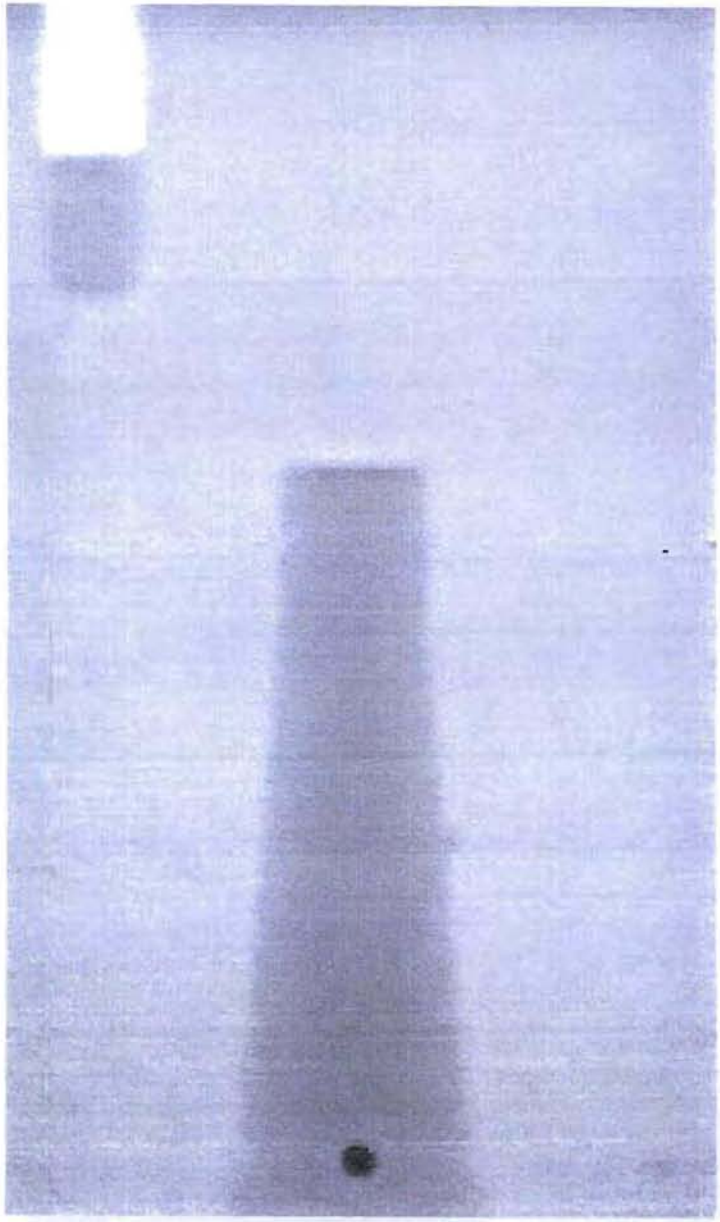
PRAD0367 Areal Density Static Camera H



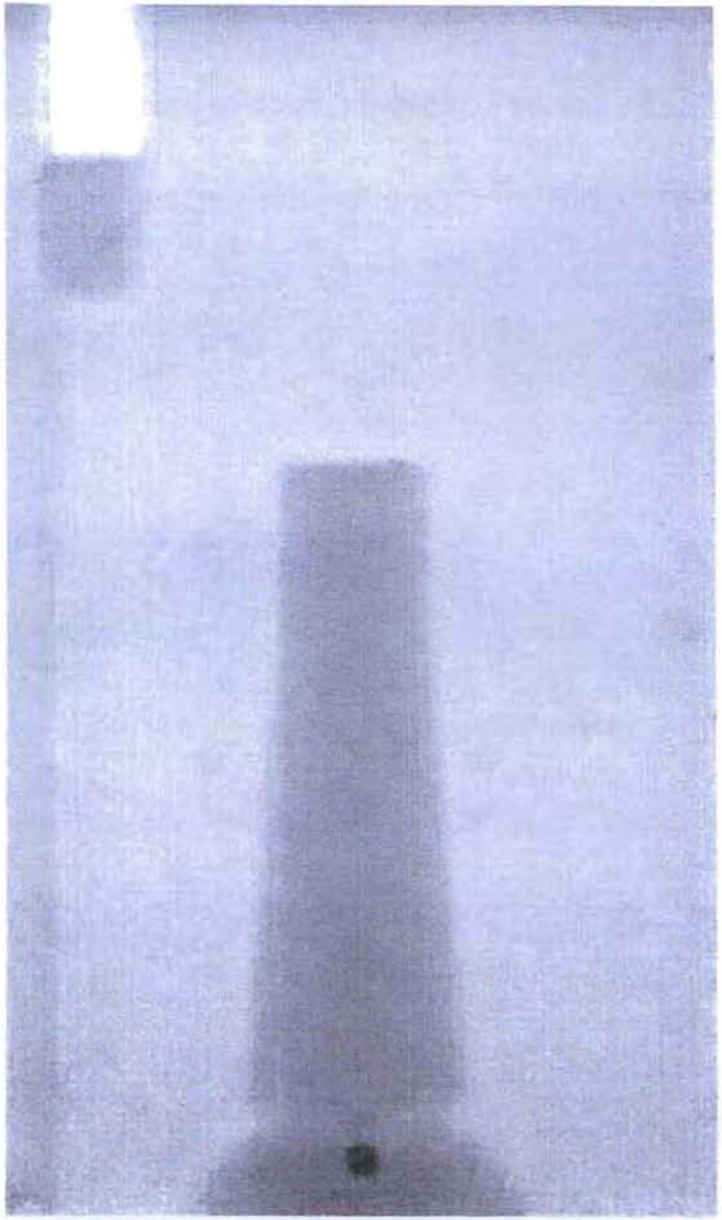
PRAD0367 Areal Density 00000 Camera H



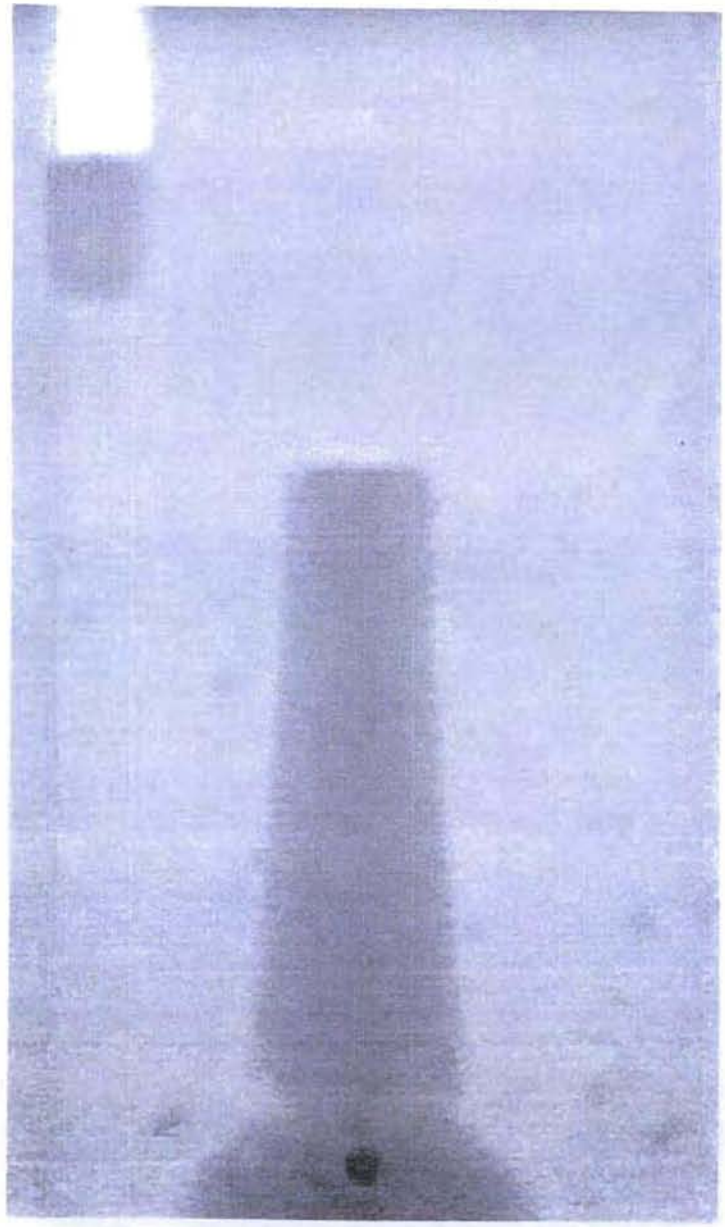
PRAD0367 Areal Density 02000 Camera K



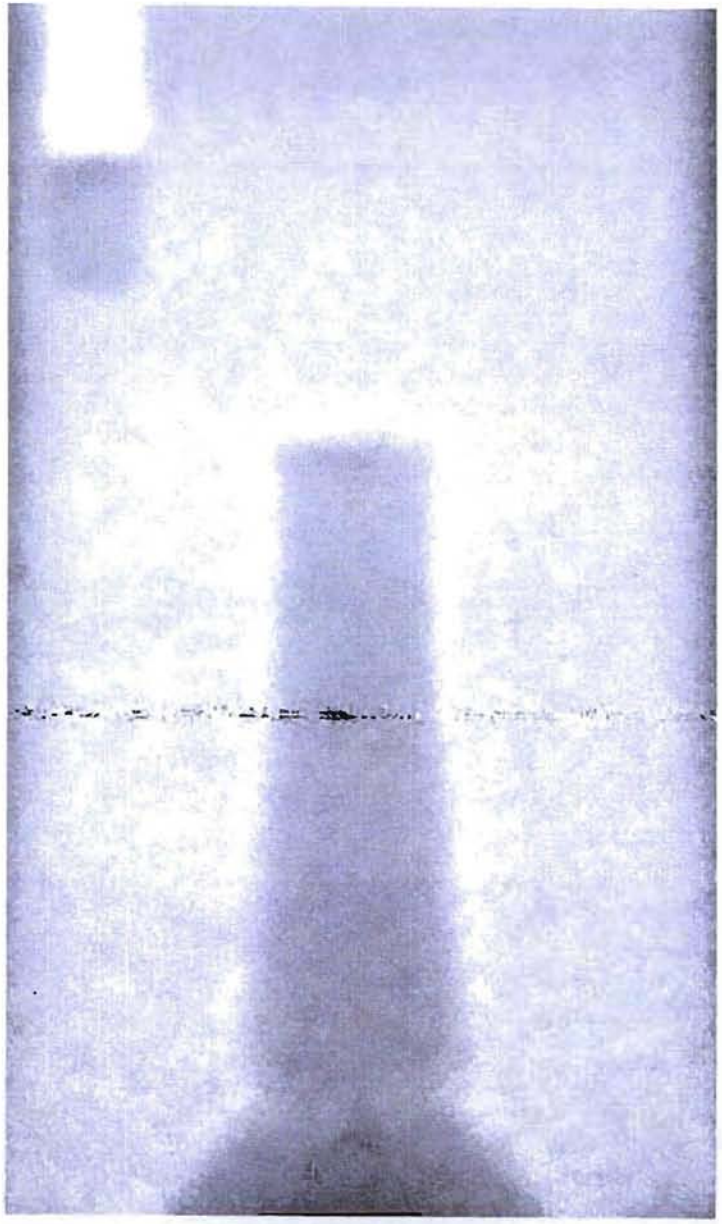
PRAD0367 Areal Density 04000 Camera N



PRAD0367 Areal Density 06000 Camera Q

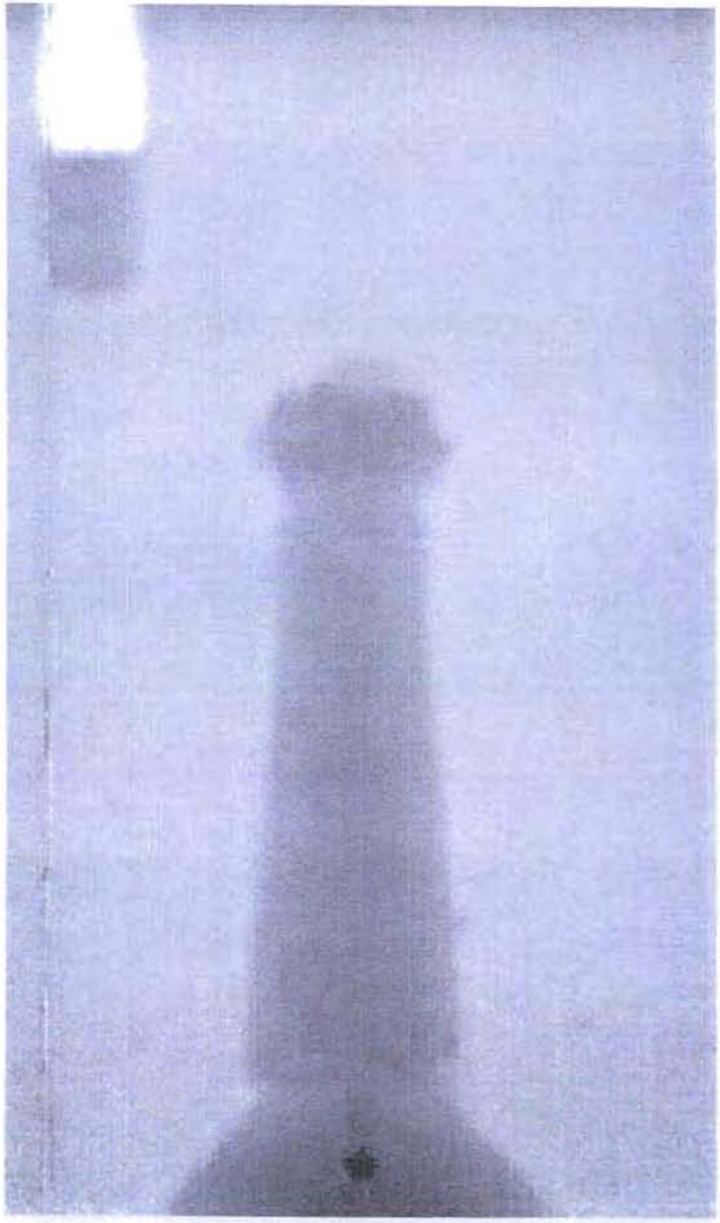


PRAD0367 Areal Density 08000 Camera A



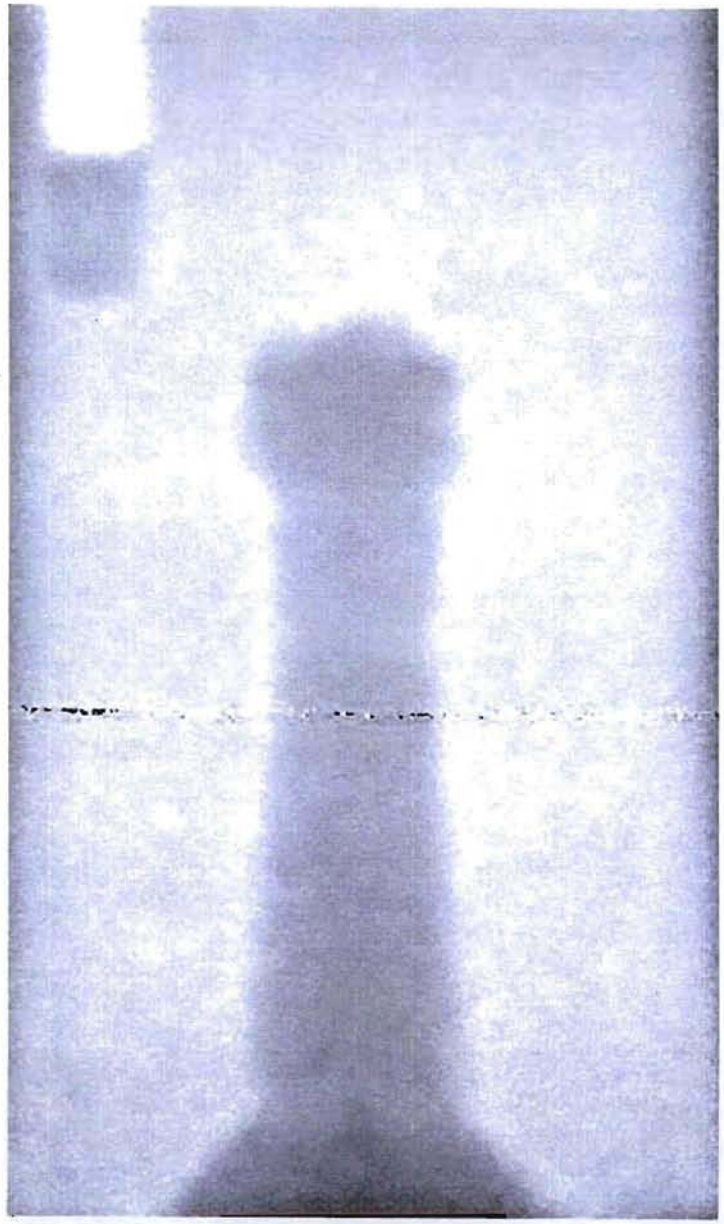
PRAD0367 Areal Density 09000 Camera T

PRAD0367 Areal Density 11000 Camera X



PRAD0367 Areal Density 13000 Camera I

PRAD0367 Areal Density 15000 Camera B



PRAD0367 Areal Density 16000 Camera L

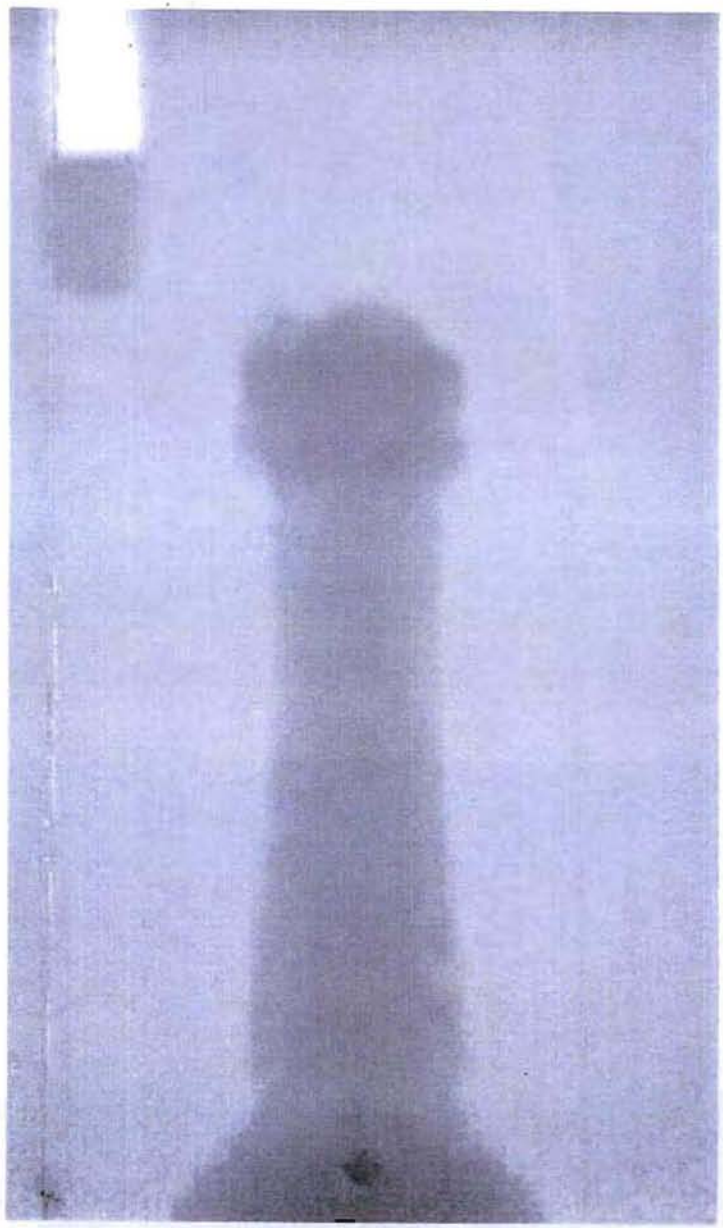
PRAD0367 Areal Density 18000 Camera O

PRAD0367 Areal Density 20000 Camera R

PRAD0367 Areal Density 22000 Camera C

PRAD0367 Areal Density 23000 Camera U

PRAD0367 Areal Density 25000 Camera Y



PRAD0367 Areal Density 27000 Camera J

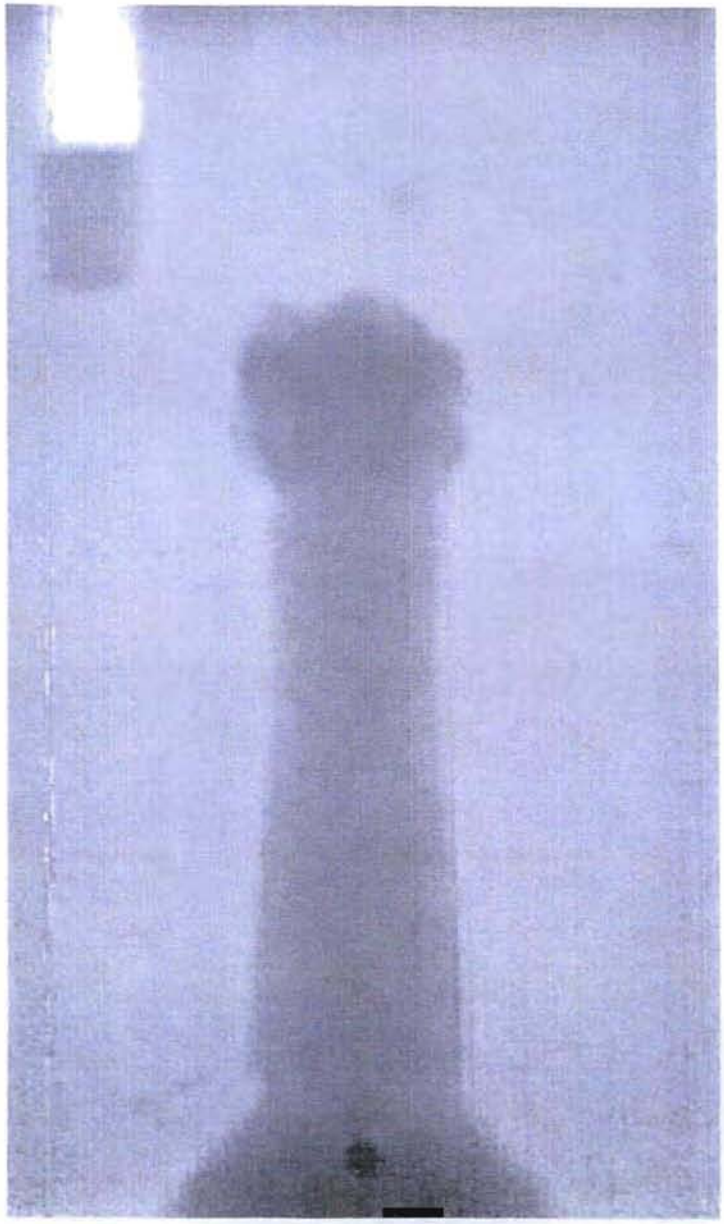
PRAD0367 Areal Density 29000 Camera D

PRAD0367 Areal Density 30000 Camera M

PRAD0367 Areal Density 32000 Camera P

PRAD0367 Areal Density 34000 Camera S

PRAD0367 Areal Density 36000 Camera E

PRAD0367 Areal Density 37000 Camera V

PRAD0367 Areal Density 00000 Camera Z