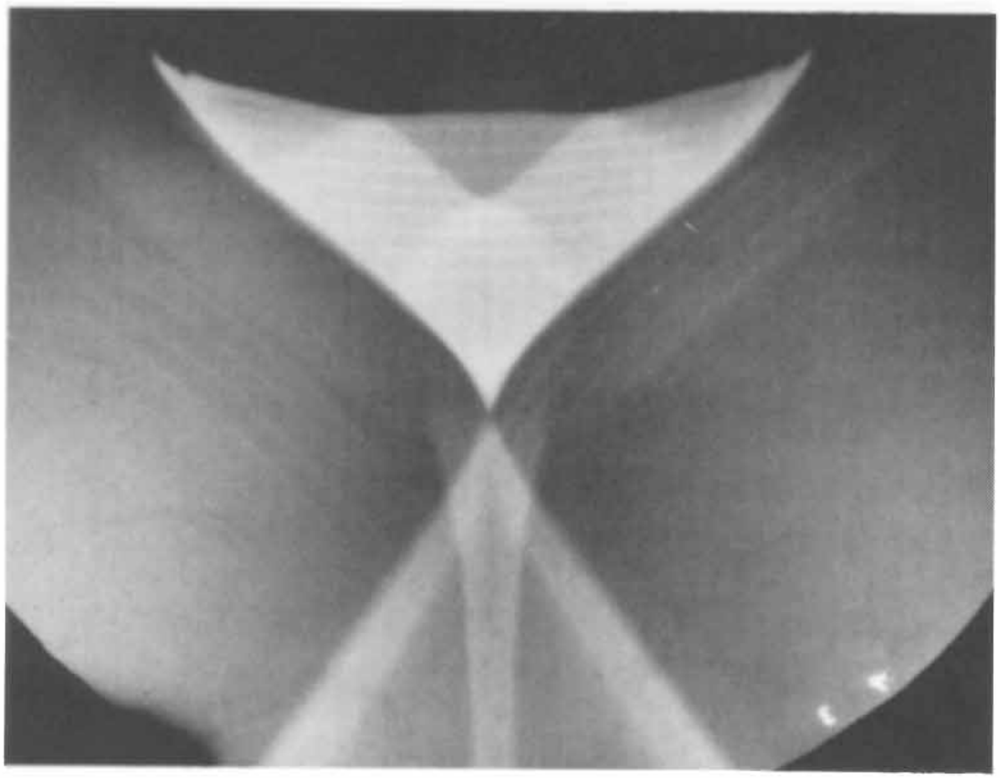
LASL PHERMEX DATA

VOLUME III



LOS ALAMOS SERIES ON DYNAMIC MATERIAL PROPERTIES

LASL PHERMEX DATA VOLUME III

Editor
Charles L. Mader

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INTRODUCTION

About 15 years ago, a unique and important flash-radiographic facility became operational at the Los Alamos Scientific Laboratory. This facility is known as PHERMEX, which is an acronym for *Pulsed High Energy Radiographic Machine Emitting X rays*. The PHERMEX machine is a high-current, 30-MeV, linear electron accelerator that produces very intense but short-duration bursts of bremsstrahlung from a thin tungsten target for flash radiographic studies of explosives and explosive-driven metal systems. The facility was built in the early 1960s to complement other hydrodynamics facilities at Los Alamos and to implement studies of shock waves, jets, spalling, detonation characteristics of chemical explosives, and other hydrodynamic phenomena.

Flash radiography has been used in diagnosing explosive-driven systems for about 40 years and has provided direct observation of dynamic processes. The size of systems that could be radiographed dynamically using conventional equipment has always been severely limited by the poor ability of the available x-ray flux to penetrate the blast protection devices. PHERMEX, however, was designed and built to overcome these limitations and to permit precise radiography of large systems containing materials of high atomic number.

PHERMEX has been used to study materials in various geometries under a variety of shock conditions. This is the third of the volumes scheduled for publication by the LASL Data Center. The PHERMEX facility is described in Volume I.

DATA PRESENTATION

The PHERMEX data, starting with Shot 801, are presented by increasing shot number, which increases according to the date the shot was planned, not necessarily the date on which it was fired. Many shots either failed or were never completed. A descriptive shot title is given, along with the date on which the shot was fired and the name of the person who originated the experiment. The radiographic time is that from initiation of the detonator to the middle of the radiograph pulse. The radiograph pulse width is 0.2 μs or 0.1 μs. The plane-wave lens and detonator burning times (typical of the PHERMEX firing system) used to estimate other times were

P-040	13.5 μs,
P-081	22.5 μs,
P-120	29.5 μs.

Literature that describes a shot or its general purpose is cited. The purpose of the shot and important features of the radiograph are discussed. The experimental setup is sketched, and certain dimensions pertinent to each shot are given in millimeters. The distance, h, of the beam axis from some shot geometry location is given. All available static radiographs are presented, and the dynamic radiographs are shown on the same scale.

The first few hundred shots, described in Volume I, were designed to survey various topics of interest in the fields of shock hydrodynamics and detonations. The process of jet formation from grooved aluminum and steel plates was investigated extensively.

The shots 401 through 800, described in Volume II, examined the dynamic fracture of other materials and the particle velocity flow patterns of detonation products. Materials such as iron, antimony, bismuth, and boron nitride, which exhibit phase change upon being shocked, were examined. Mach and regular reflections in metals and explosives were studied.

Shots 801 through 1943, described in this volume, examined the effect of holes and metal plates on a propagating detonating wave, the Mach and regular reflection waves that result from colliding detonation waves, corner turning by detonation waves, explosive desensitization by preshocking, and Taylor instabilities.

Many of the shots were not included in this volume because they were performed in confinement vessels, and the quality of the radiograph is inadequate to permit reproduction of the interesting features. Other shots were not included because they were performed for contractors who consider the data proprietary.

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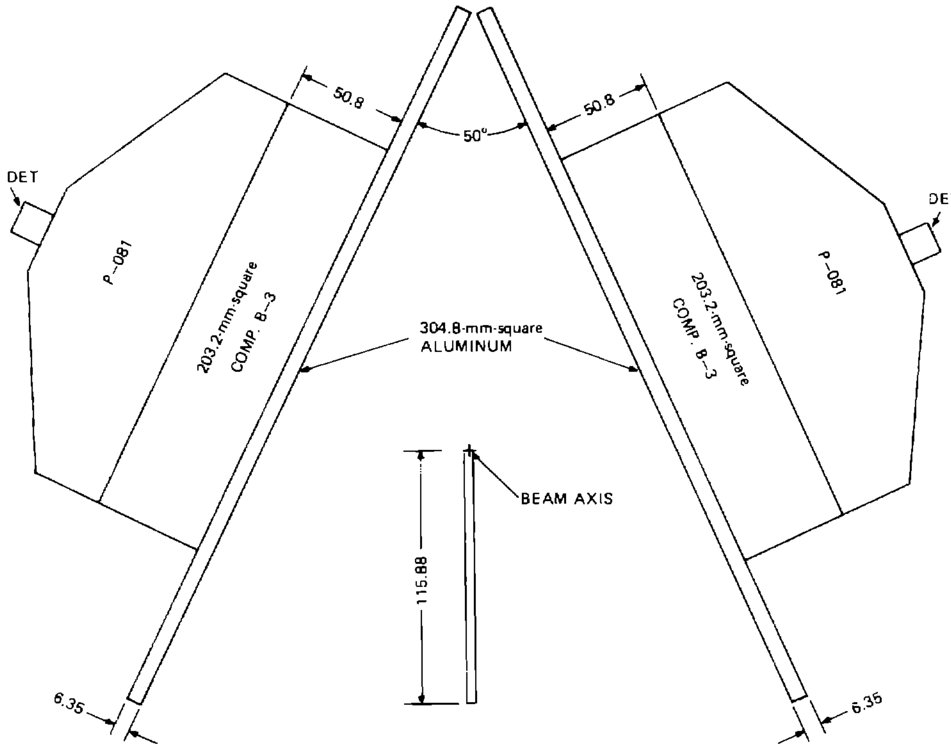
CATALOG OF SHOT SUBJECTS, PHERMEX SHOTS 1 THROUGH 1943 (VOLUMES I, II, and III)

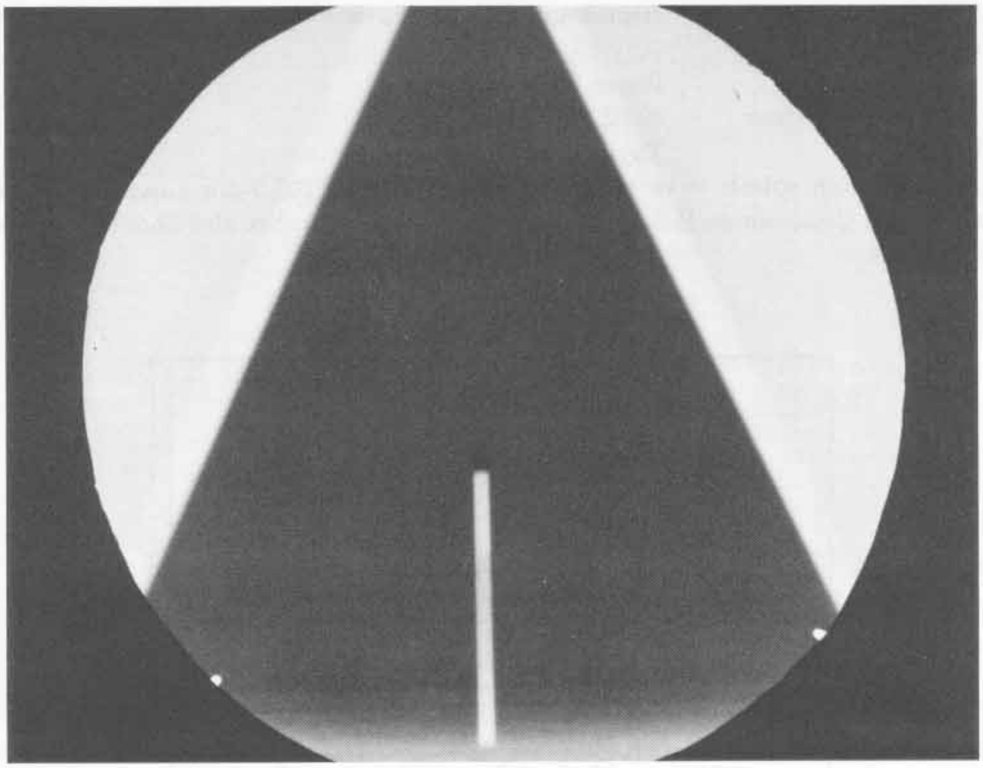
SUBJECT INDEX (VOLUMES I, II, and III)

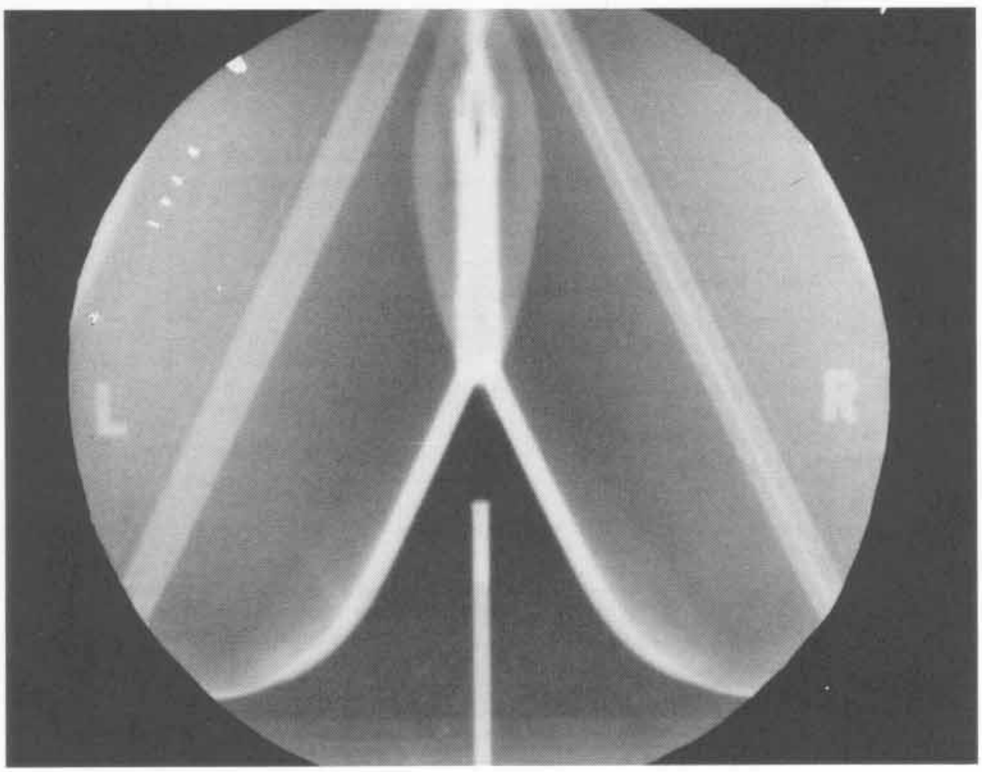
PHERMEX SHOTS 801 THROUGH 1943

SHOT 801: **Colliding Aluminum Plates**
Date: June 29, 1967
Experimenter: Roger W. Taylor
Radiographic Time: 48.29 μs

Two 6.35-mm-thick aluminum plates at a 50° angle were each driven by 50.8 mm of Composition B-3 initiated by a P-081 lens.



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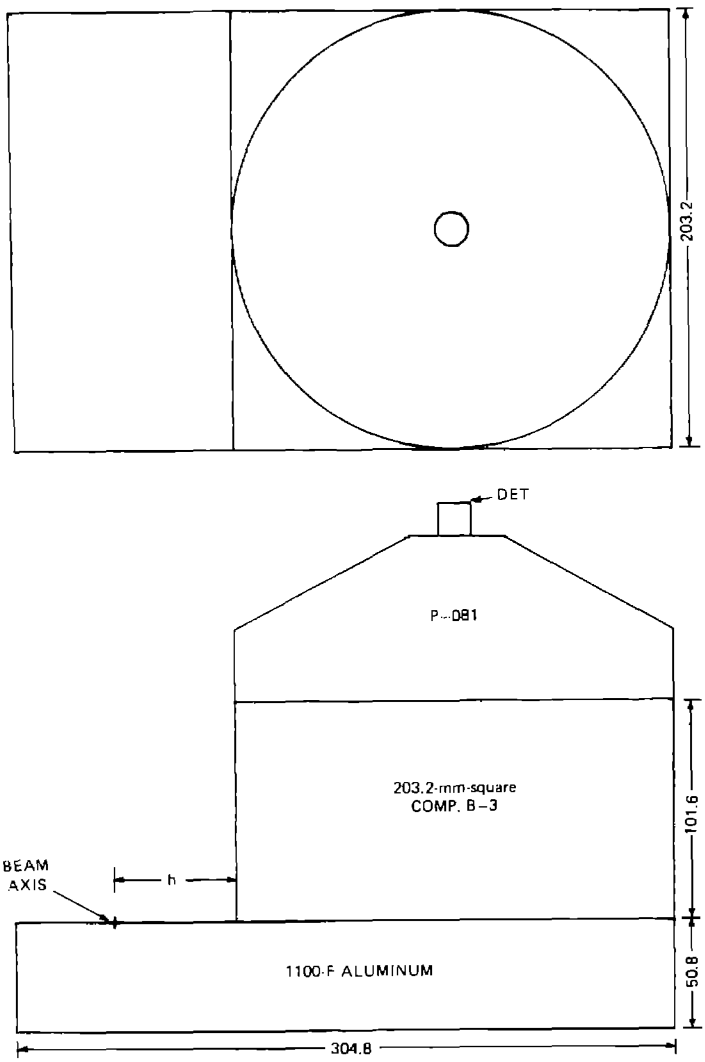
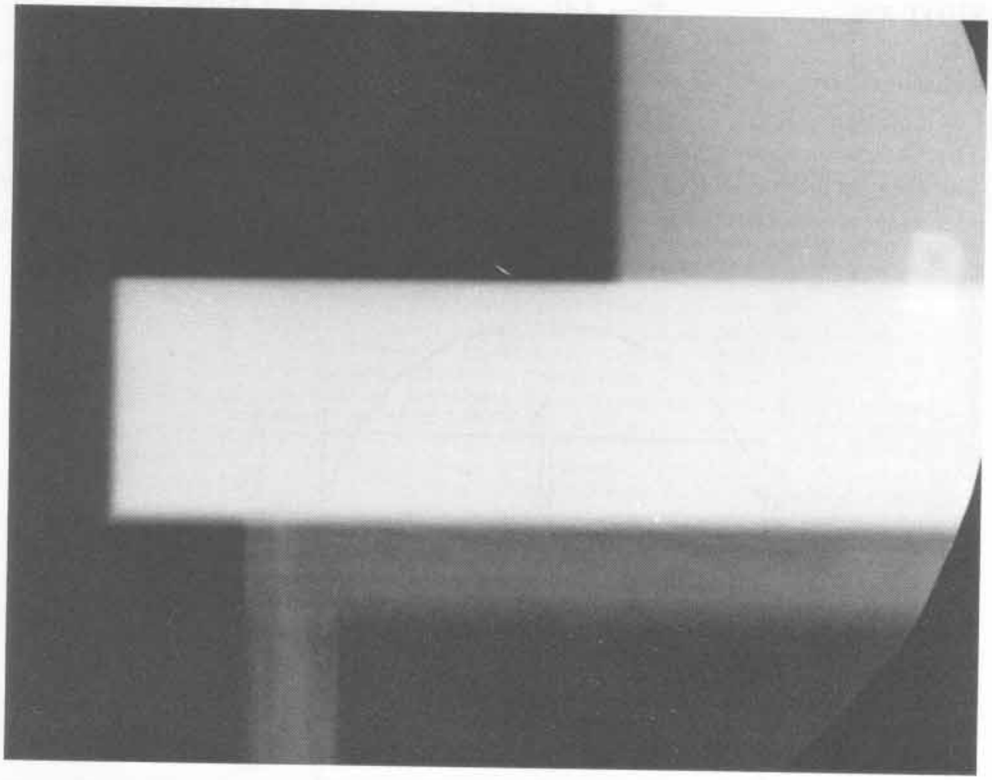
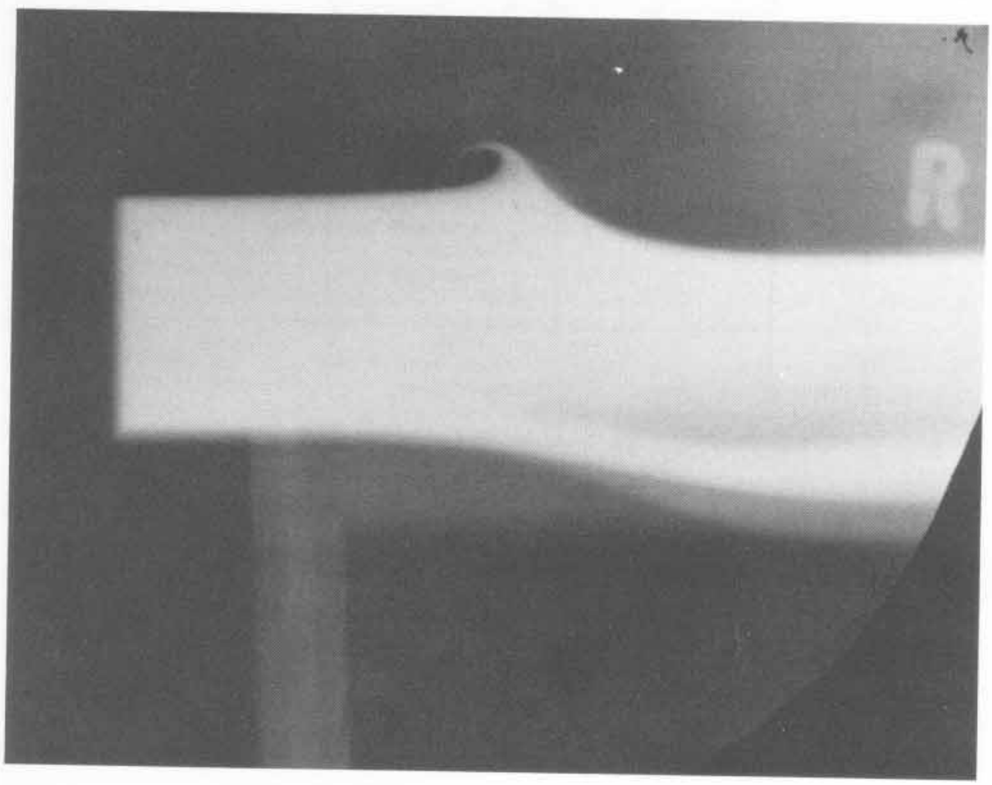
SHOT 804: **Aluminum Splash Wave**
Date: July 25, 1967
Experimenter: Roger W. Taylor
Radiographic Time: 49.02 μs
Reference: Taylor and Venable, 1968

An aluminum splash wave generated by a 101.6- by 203.2-mm-square block of detonated Composition B-3 was initiated by a P-081 lens. See also Shot 834. h was 51.11 mm.



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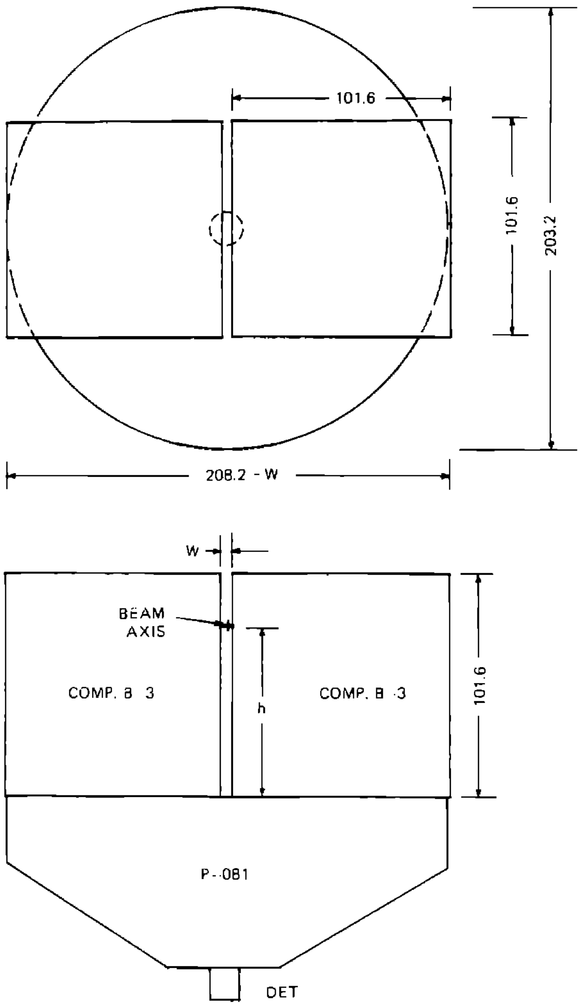
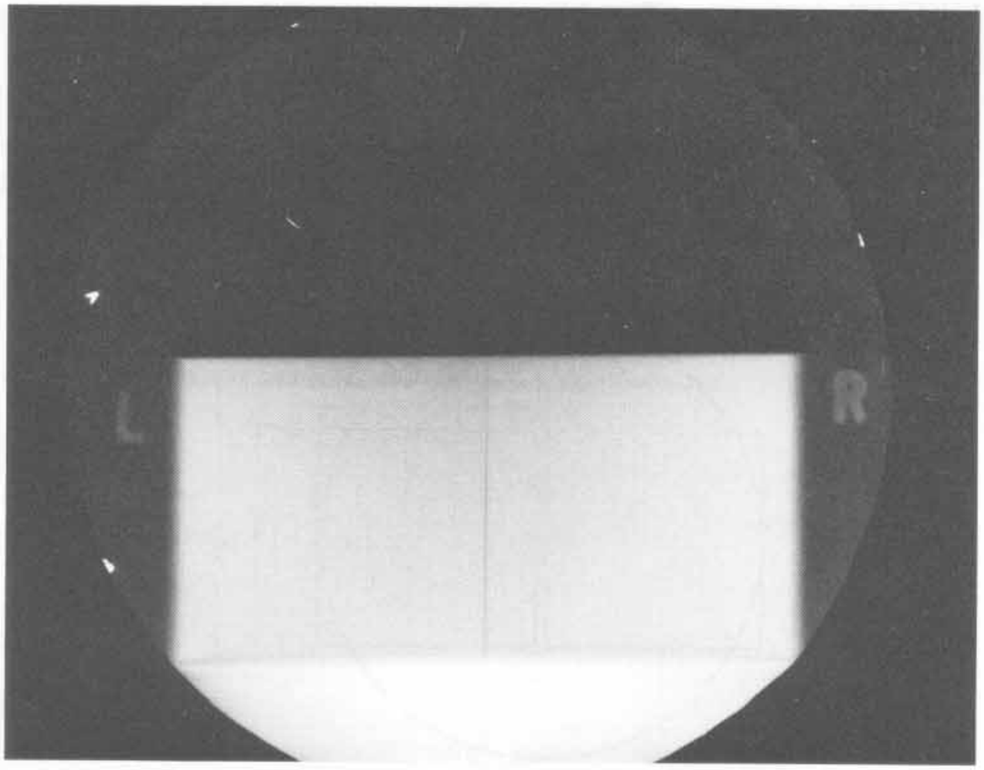
SHOT 806: **Two Adjacent Composition B-3 Detonations**
Date: August 22, 1967
Experimenter: Roger W. Taylor
Radiographic Time: 33.82 μs

Two Composition B-3 detonations were separated by a 0.127-mm-wide air gap, w. The charges were initiated by a P-081 lens. The detonations ran along the gap for 88.9 mm. h was 88.9 mm.

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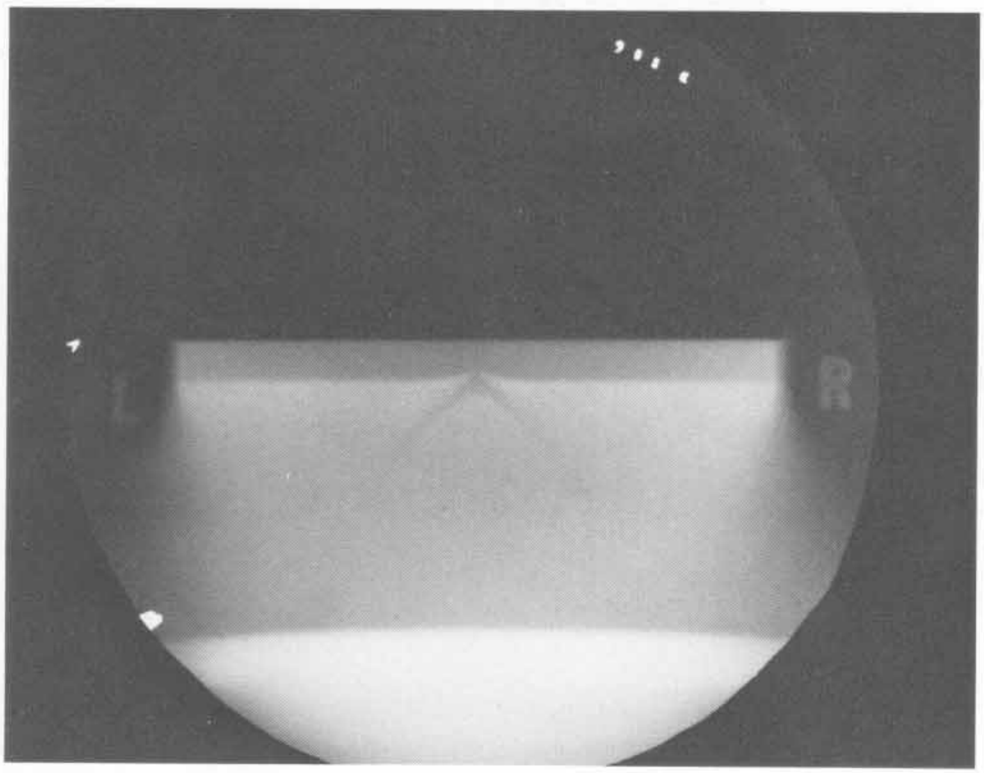
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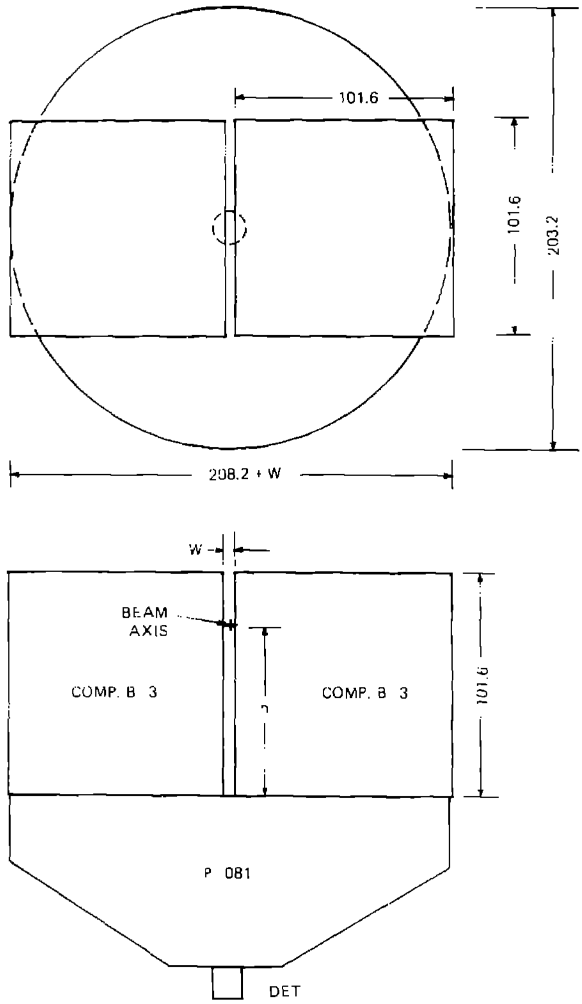
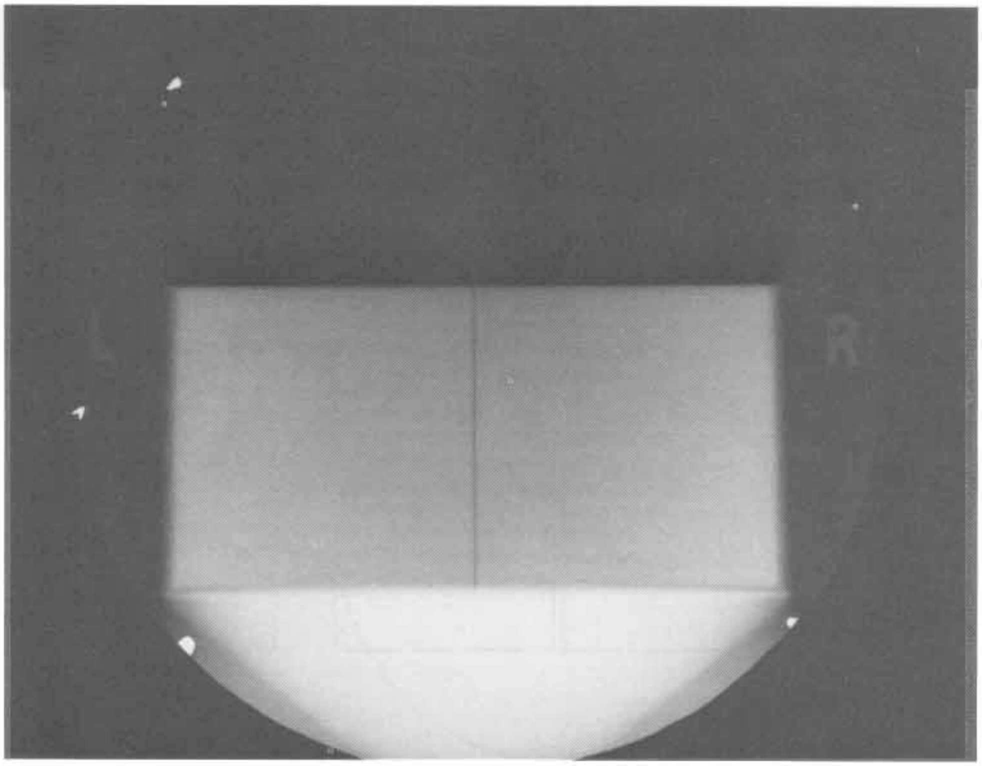
SHOT 823: **Two Adjacent Composition B-3 Detonations**
Date: August 23, 1967
Experimenter: Roger W. Taylor
Radiographic Time: 32.23 μs

Two Composition B-3 detonations were separated by a 0.127-mm-wide air gap, w. The charge was initiated by a P-081 lens. The detonations ran 76.2 mm. h was 76.2 mm.

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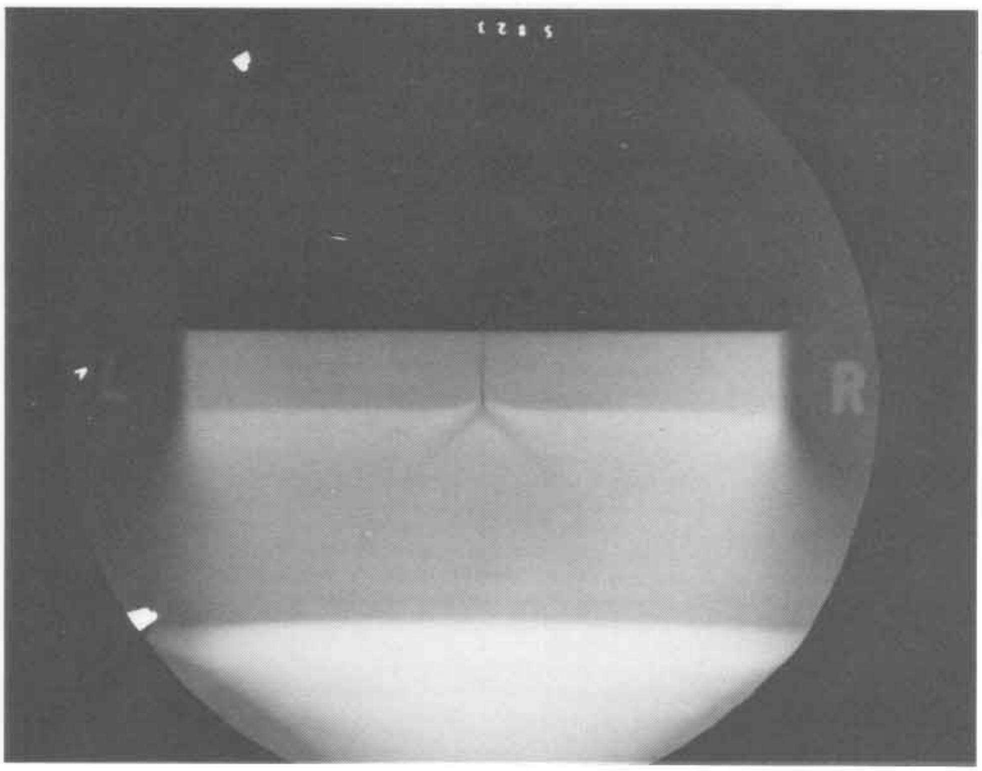
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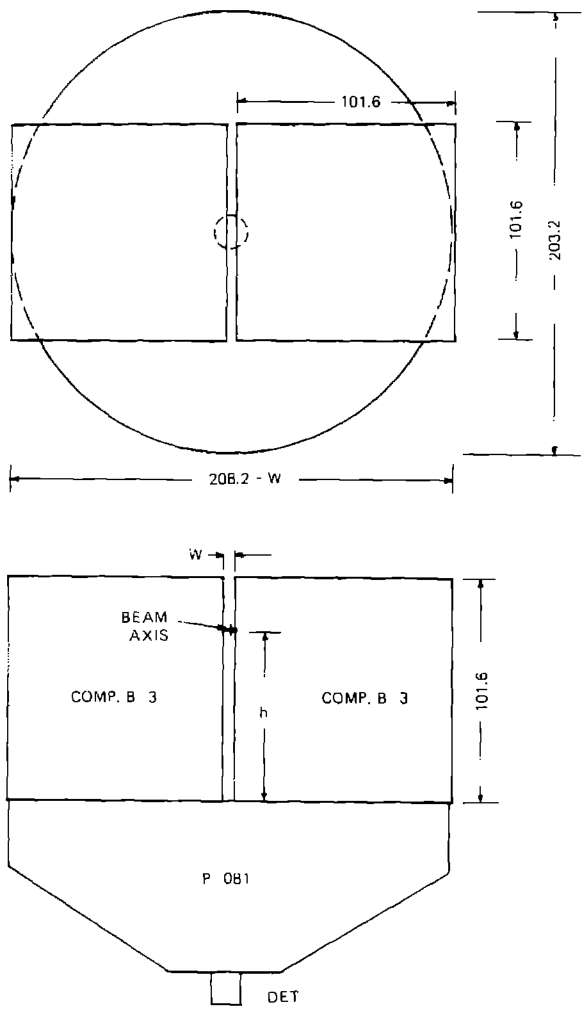
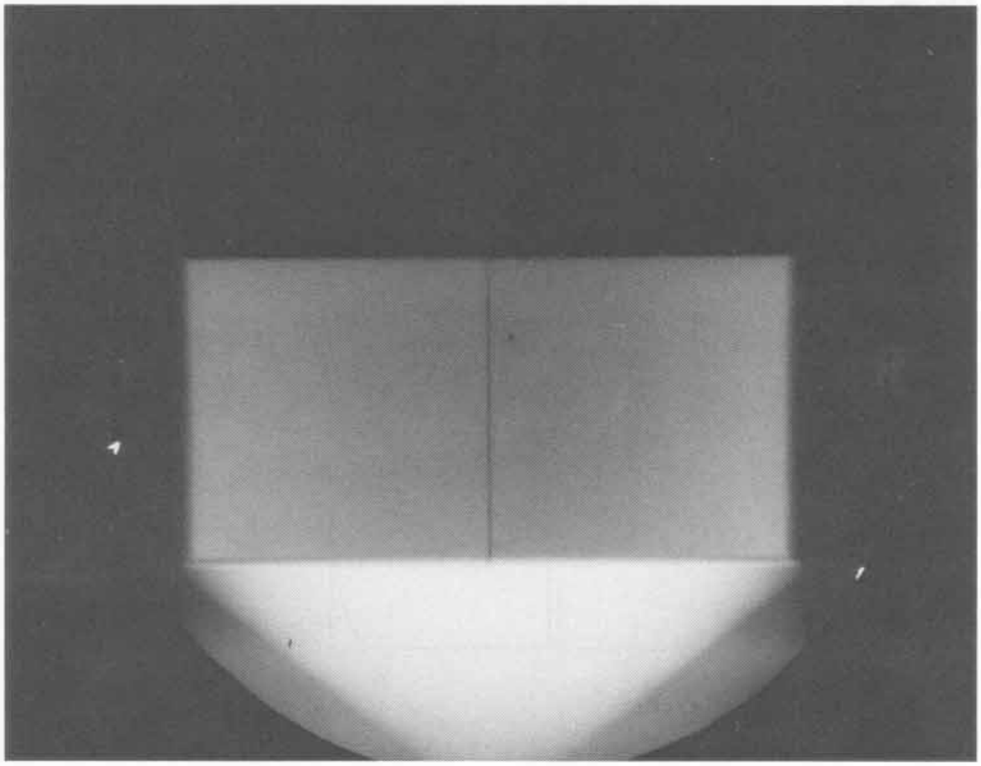
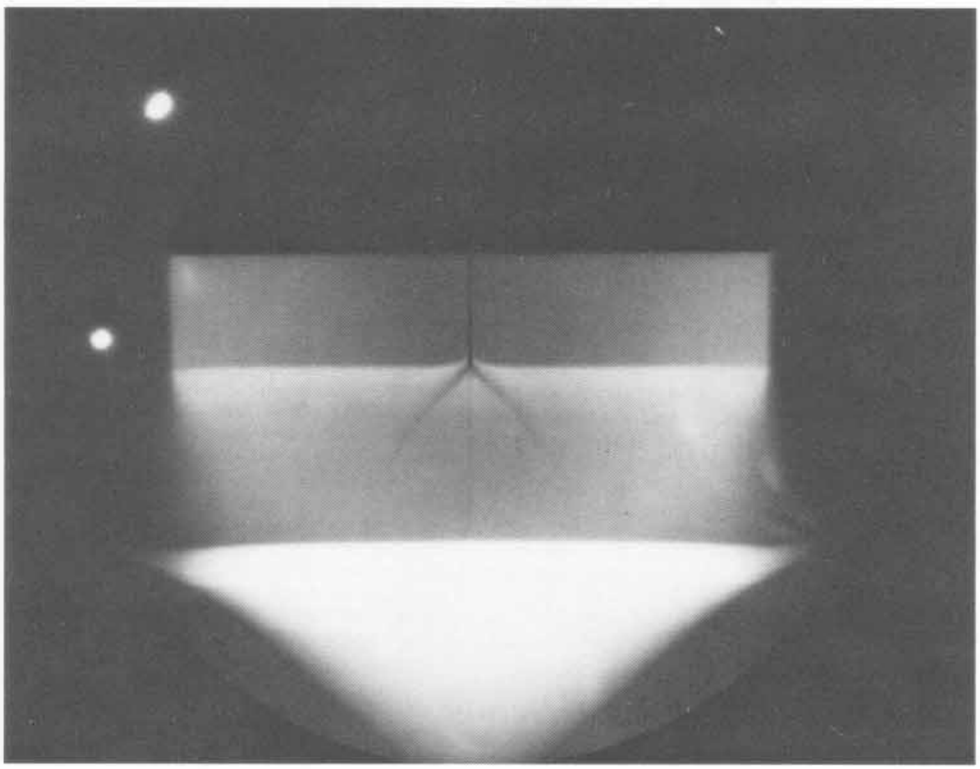
SHOT 824: **Two Adjacent Composition B-3 Detonations**
Date: August 24, 1967
Experimenter: Roger W. Taylor
Radiographic Time: 30.66 μs

Two Composition B-3 detonations were separated by a 0.127-mm-wide air gap, w. The charges were initiated by a P-081 lens. The detonations ran along the gap for 63.5 mm. h was 63.5 mm.

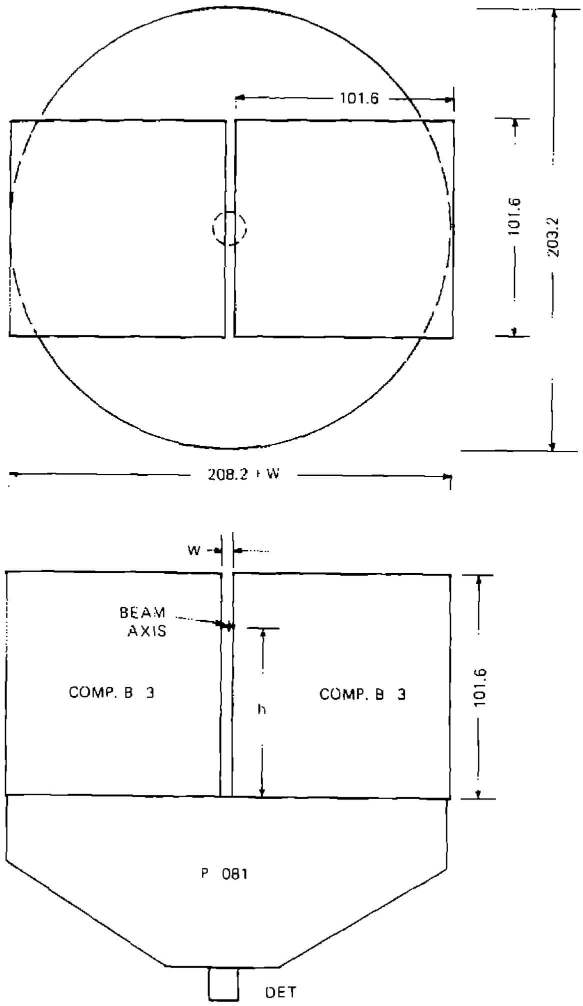


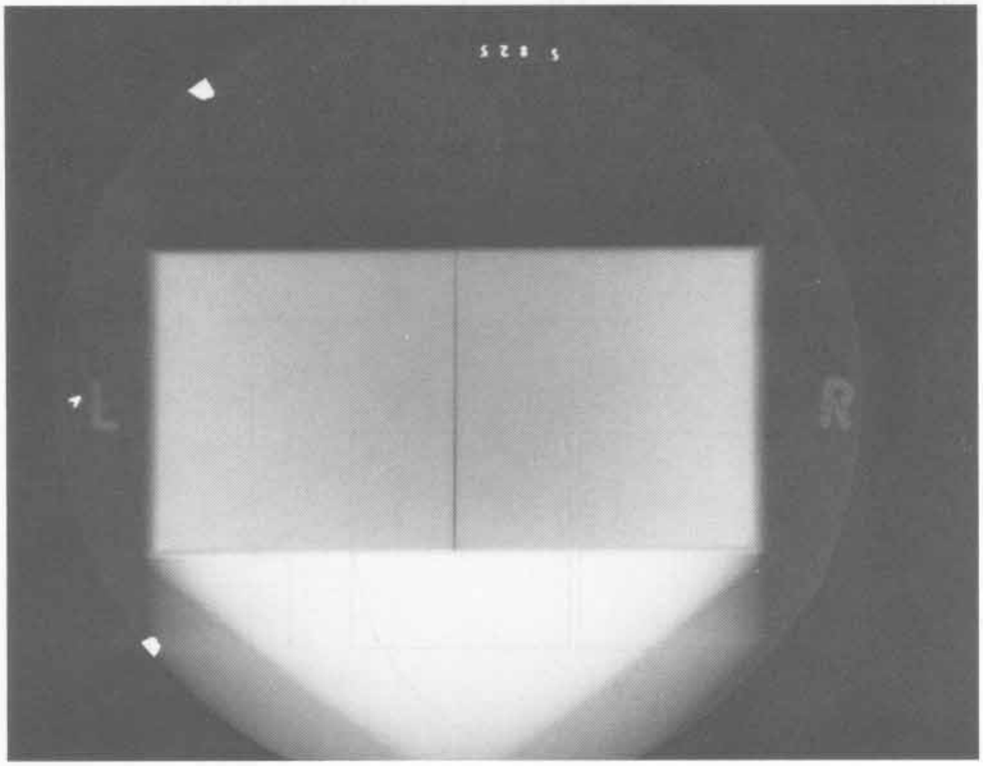


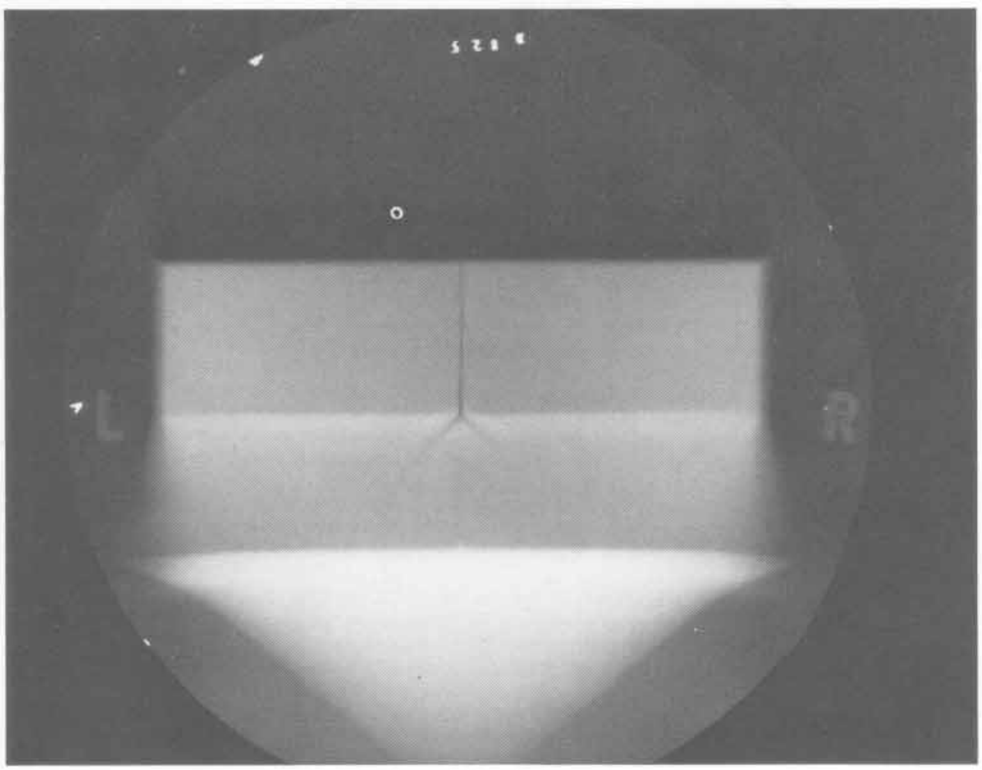


SHOT 825: **Two Adjacent Composition B-3 Detonations**
Date: August 30, 1967
Experimenter: Roger W. Taylor
Radiographic Time: 29.05 μs

Two Composition B-3 detonations were separated by a 0.127-mm-wide air gap, w. The charges were initiated by a P-081 lens. The detonations ran along the gap for 50.8 mm. h was 50.8 mm.

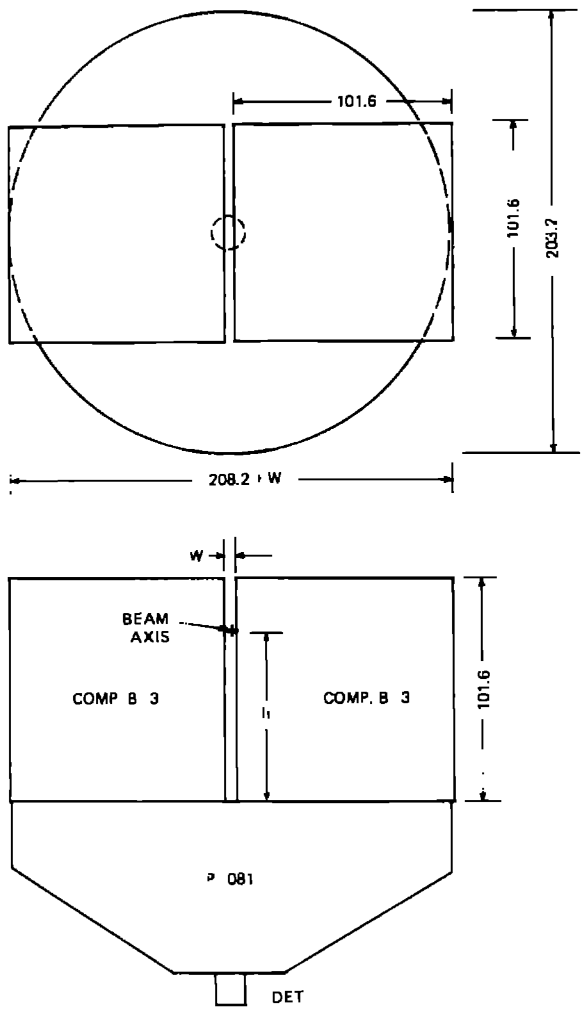


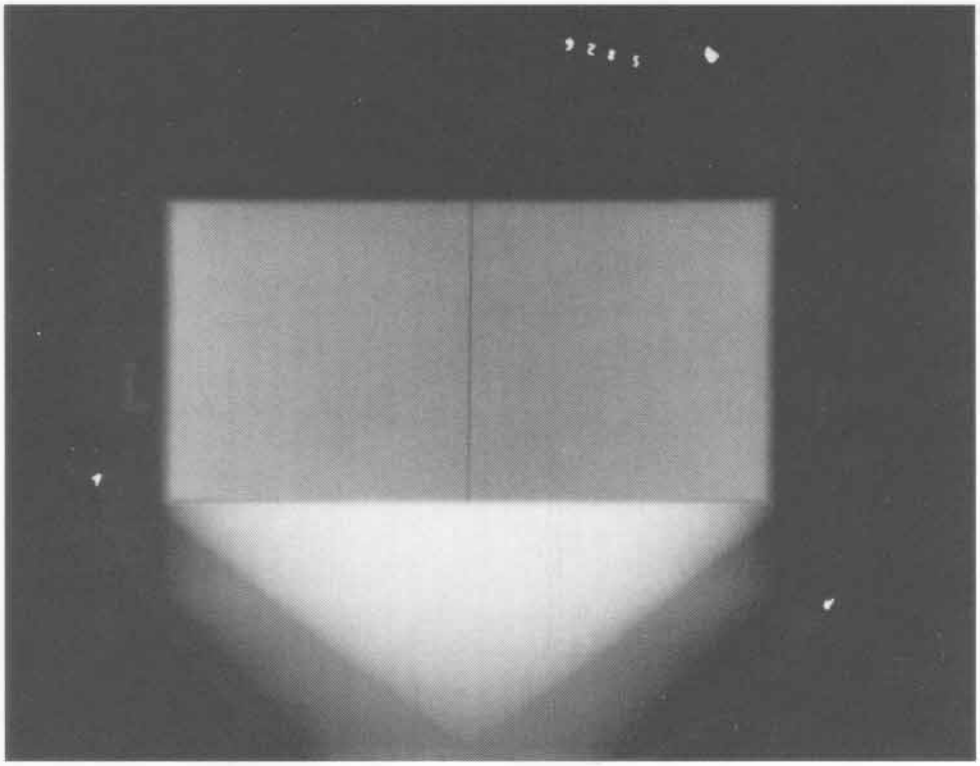


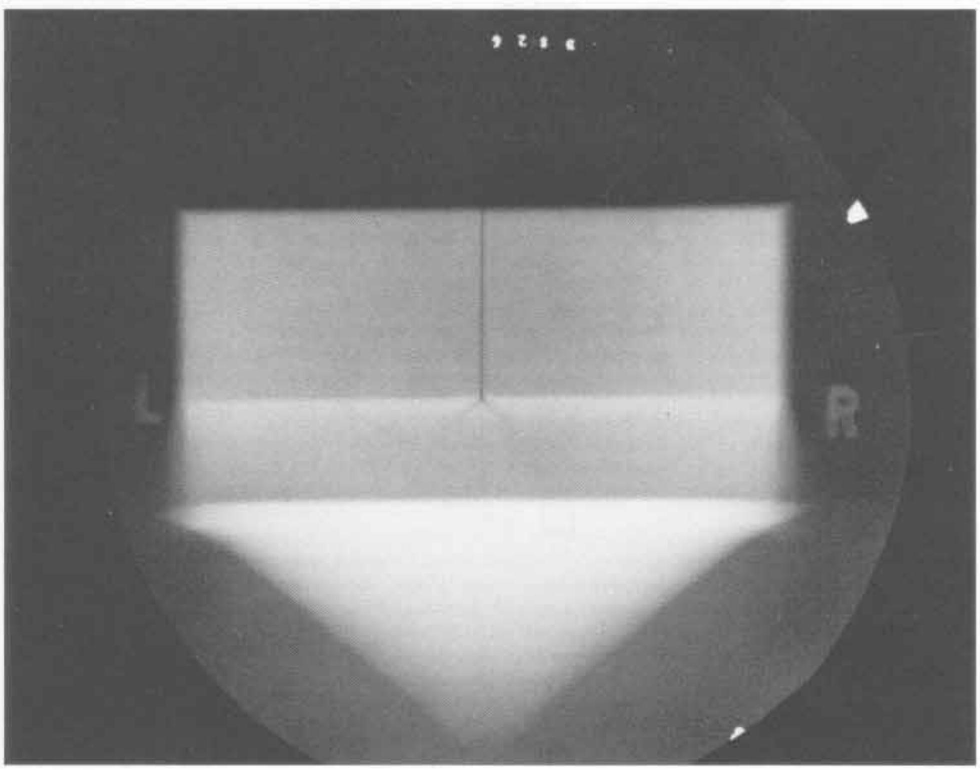


SHOT 826: **Two Adjacent Composition B-3 Detonations**
Date: August 30, 1967
Experimenter: Roger W. Taylor
Radiographic Time: 27.45 μs

Two Composition B-3 detonations were separated by a 0.127-mm-wide air gap, w. The charges were initiated by a P-081 lens. The detonations ran along the gap for 38.1 mm. h was 38.1 mm.

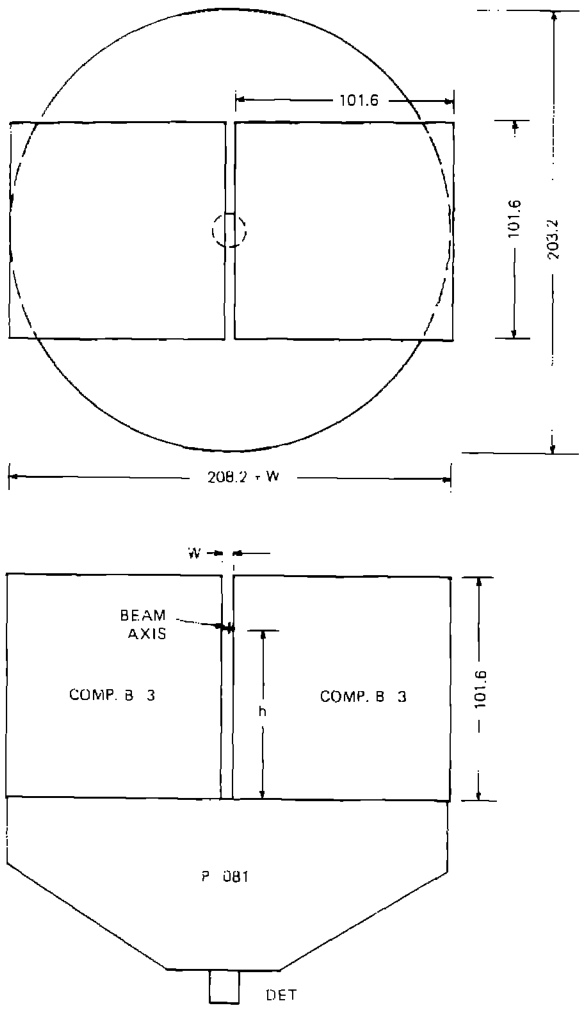


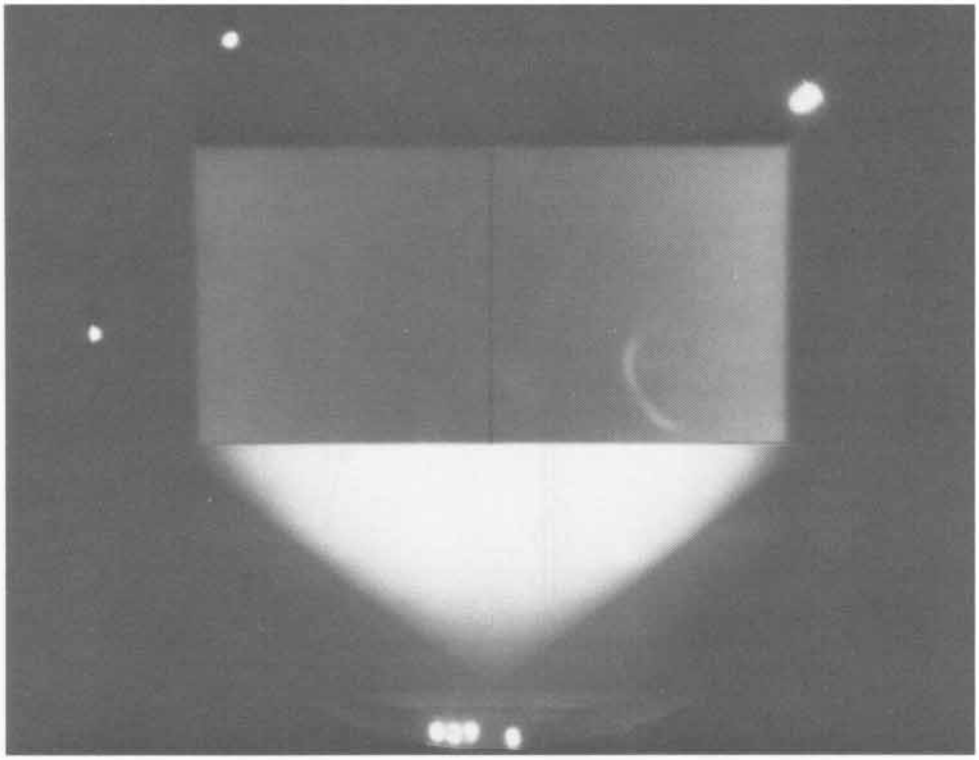


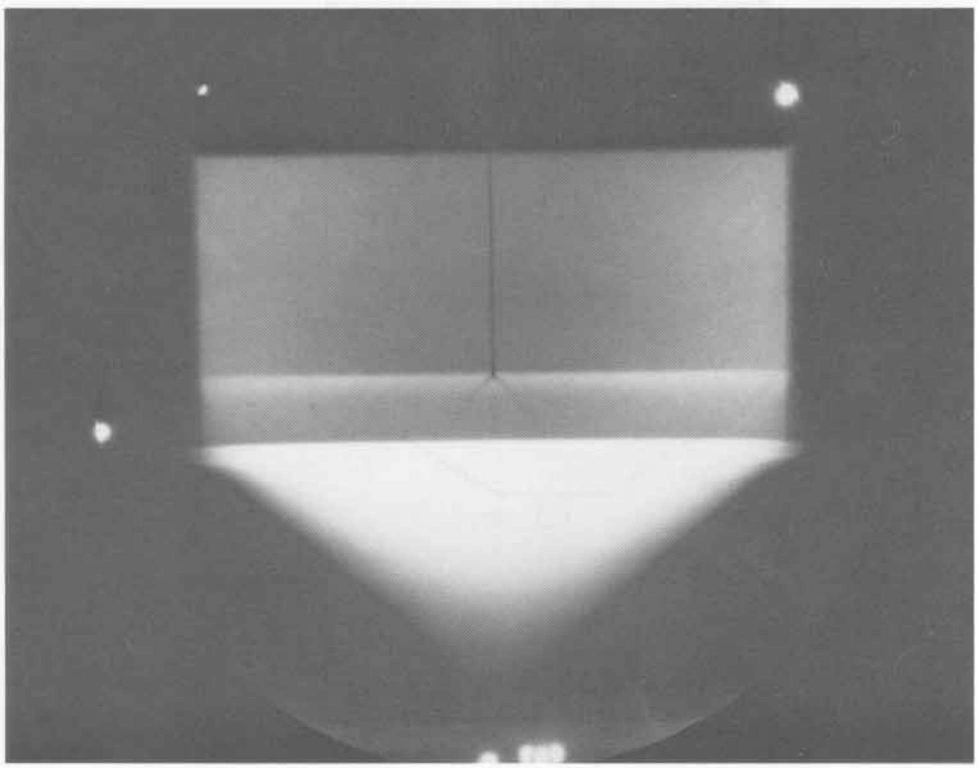


SHOT 827:	**Two Adjacent Composition B-3 Detonations**
Date:	August 30, 1967
Experimenter:	Roger W. Taylor
Radiographic Time:	25.90 μs

Two Composition B-3 detonations were separated by a 0.127-mm-wide air gap, w. The charges were initiated by a P-081 lens. The detonations ran along the gap for 25.4 mm. h was 25.4 mm.

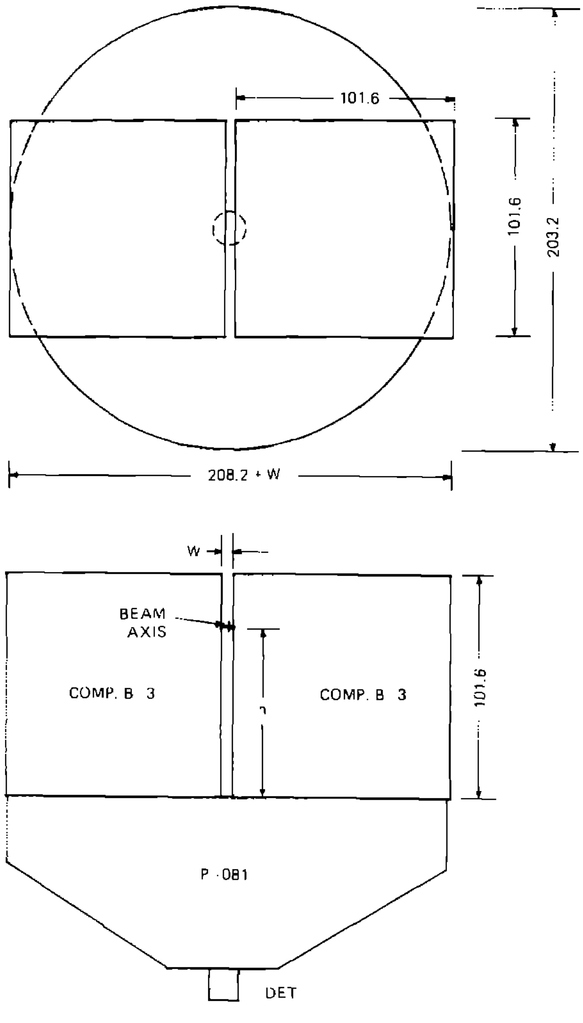


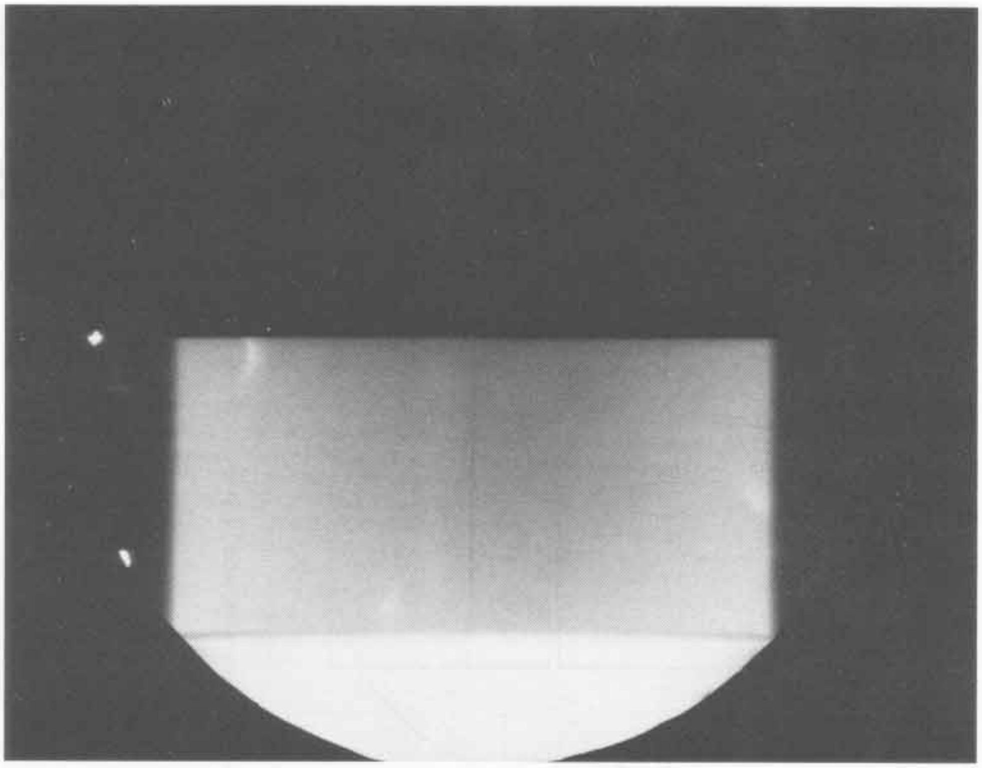


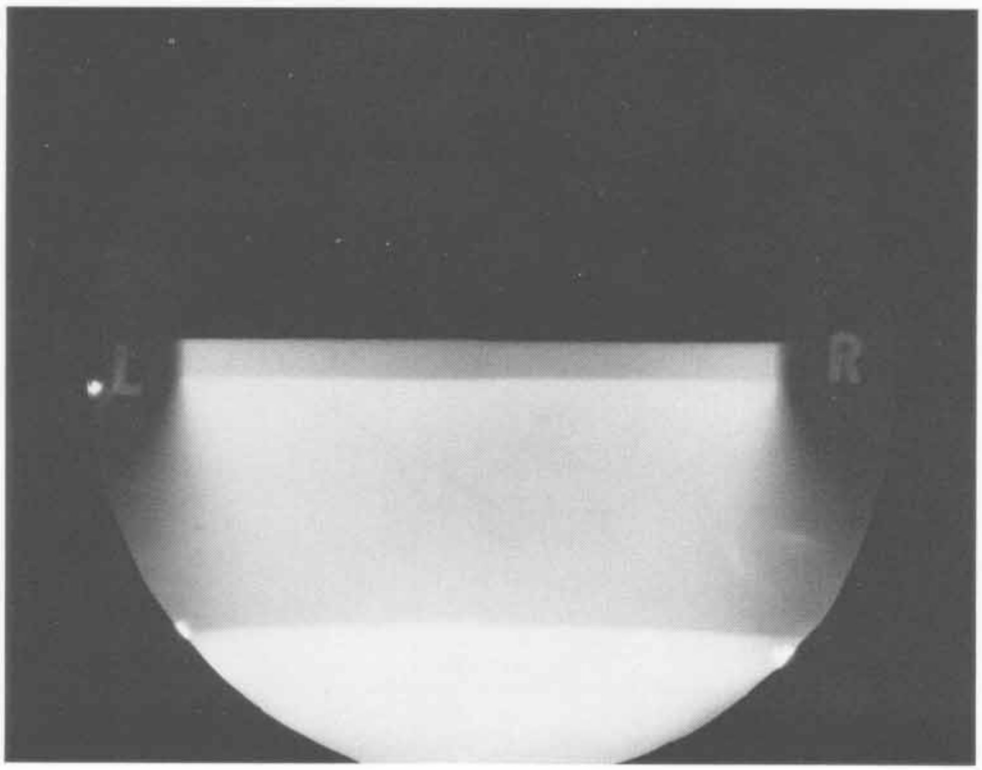


SHOT 828:	**Two Adjacent Composition B-3 Detonations**
Date:	August 30, 1967
Experimenter:	Roger W. Taylor
Radiographic Time:	33.82 μs

Two Composition B-3 detonations were separated by w, the minimum air gap possible between two Composition B-3 blocks. The charges were initiated by a P-081 lens. The detonations ran along the gap for 88.9 mm. h was 88.9 mm.



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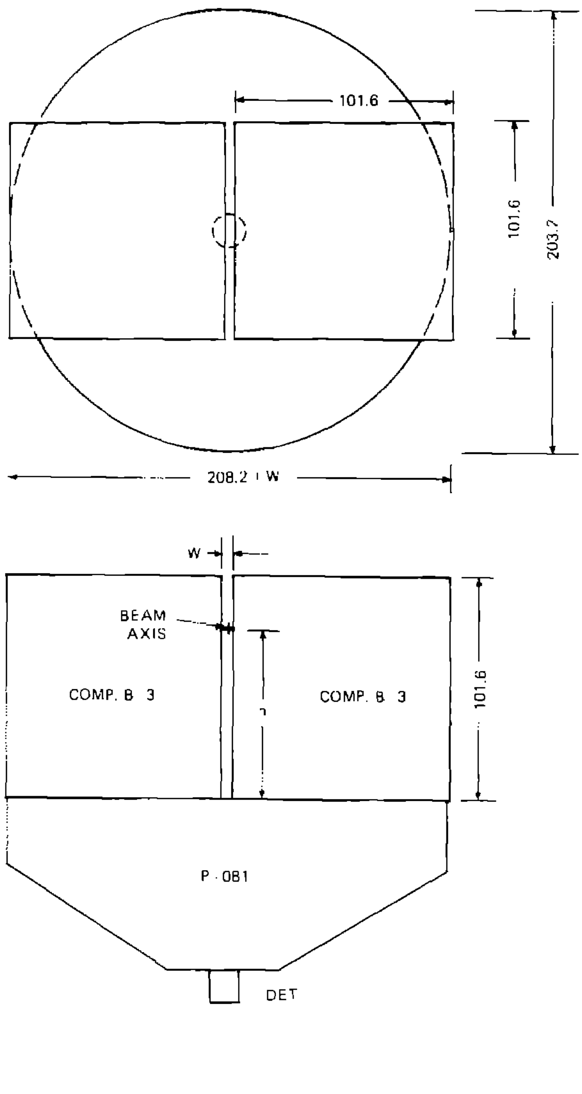
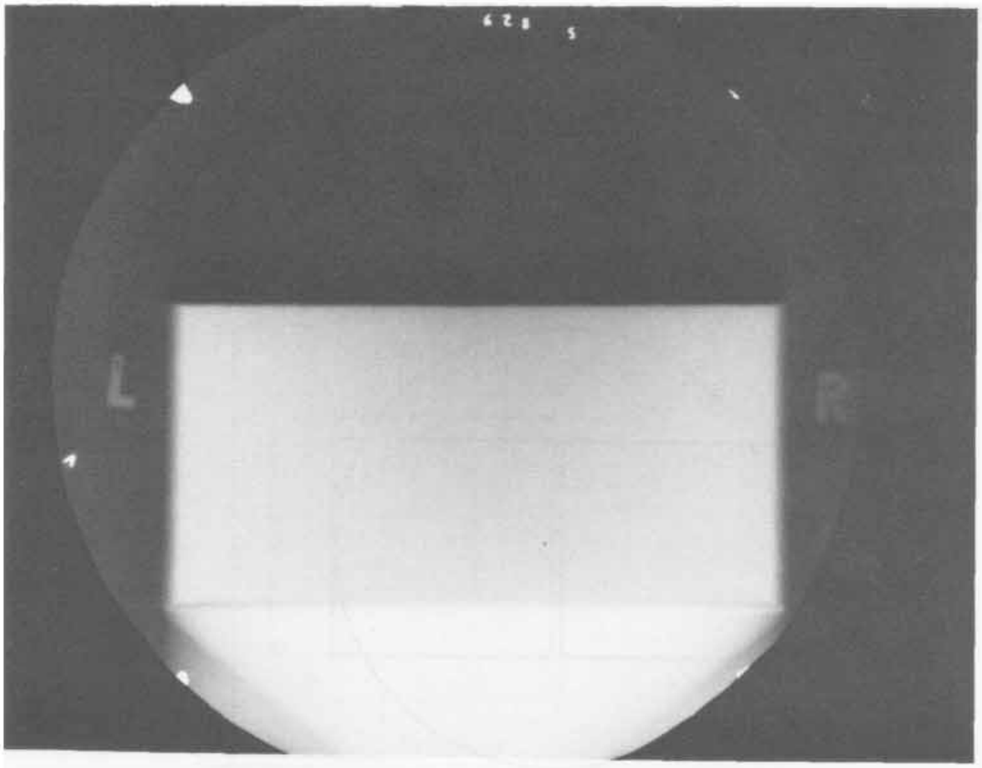
SHOT 829: **Two Adjacent Composition B-3 Detonations**
Date: August 31, 1967
Experimenter: Roger W. Taylor
Radiographic Time: 32.23 μs

Two Composition B-3 detonations were separated by w, the minimum air gap possible between two Composition B-3 blocks. The charges were initiated by a P-081 lens. The detonations ran along the gap for 76.2 mm. h was 76.2 mm.

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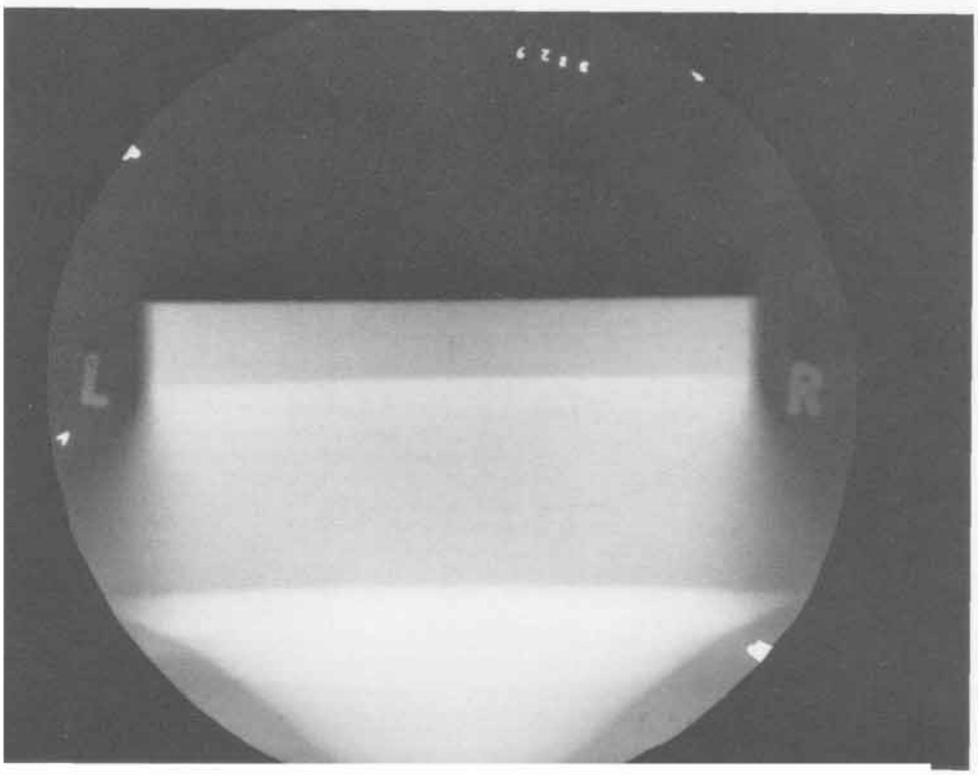
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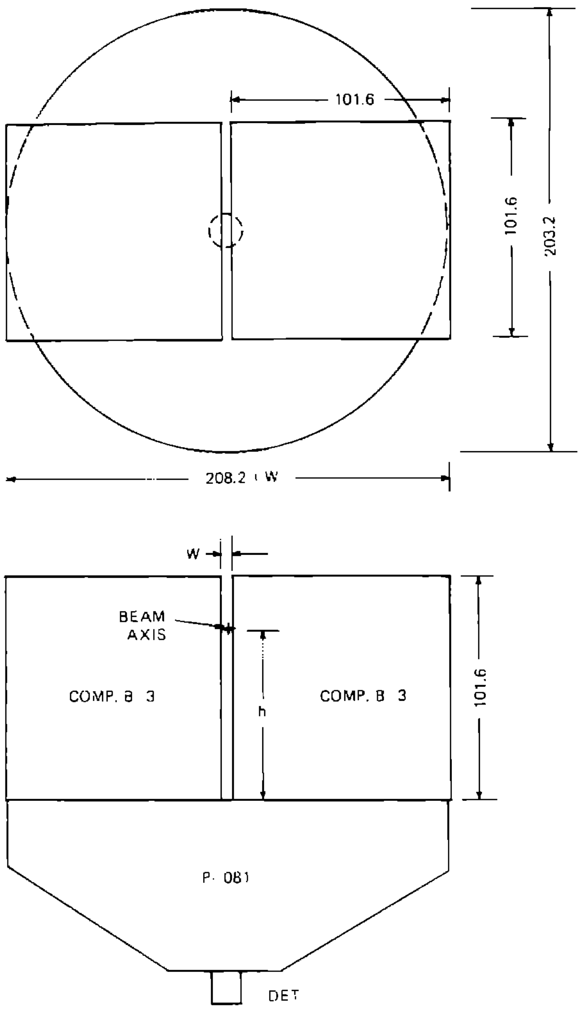
SHOT 830: **Two Adjacent Composition B-3 Detonations**

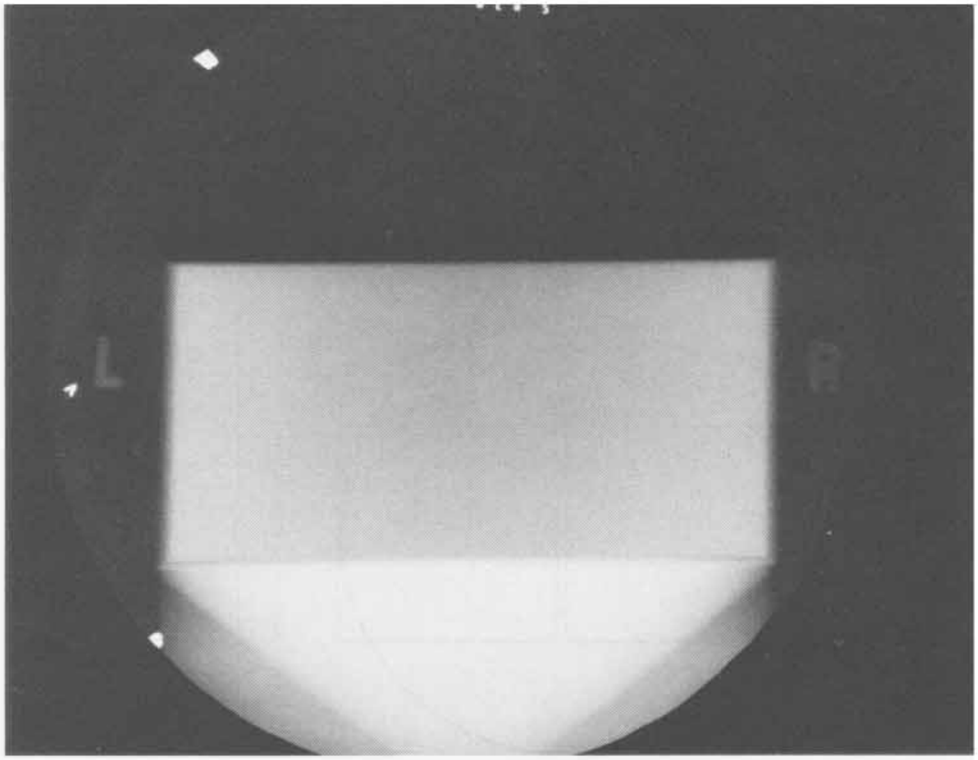
Date: August 31, 1967

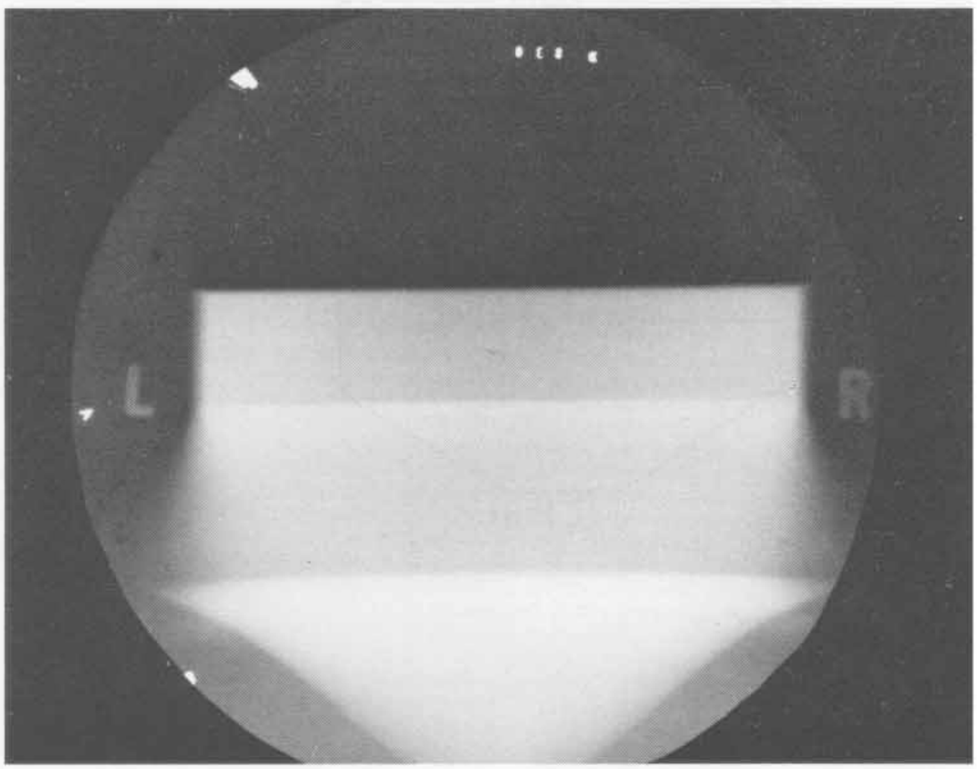
Experimenter: Roger W. Taylor

Radiographic Time: 30.68 μs

Two Composition B-3 detonations were separated by w, the minimum air gap possible between two Composition B-3 blocks. The charges were initiated by a P-081 lens. The detonation ran along the gap for 63.5 mm. h was 63.5 mm.

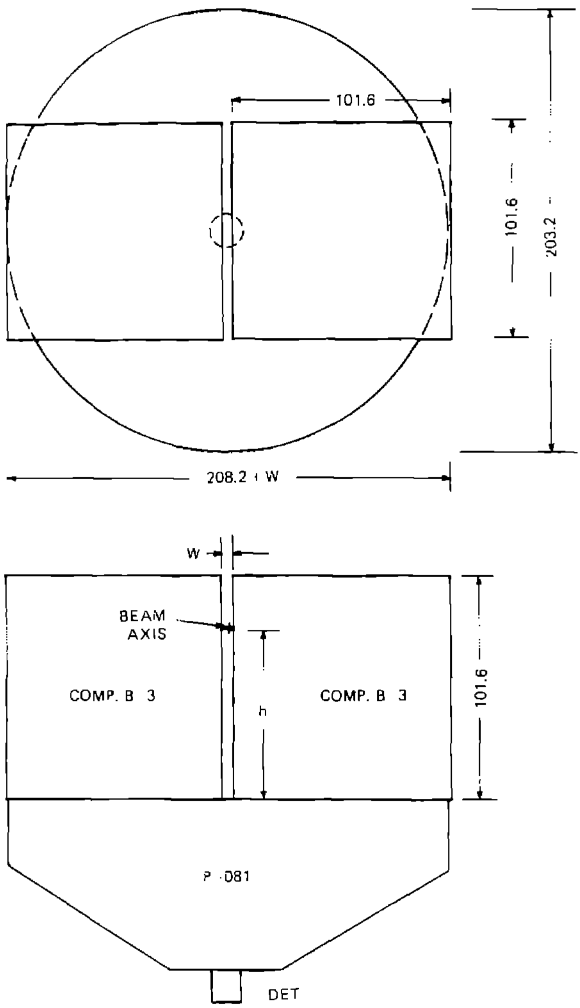


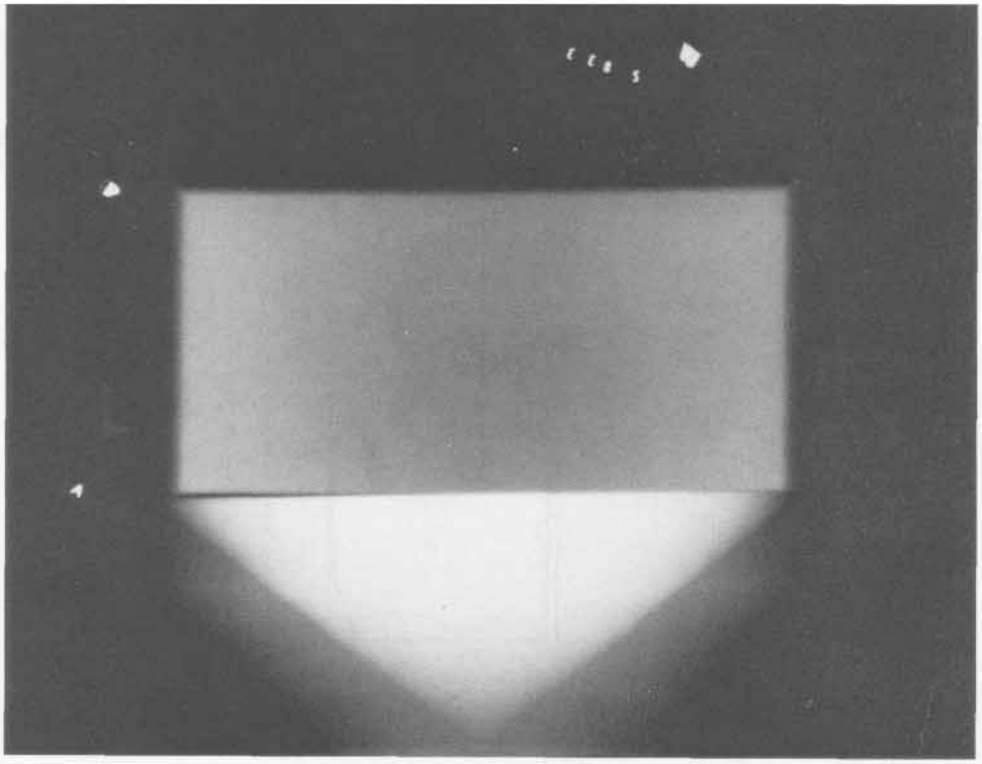


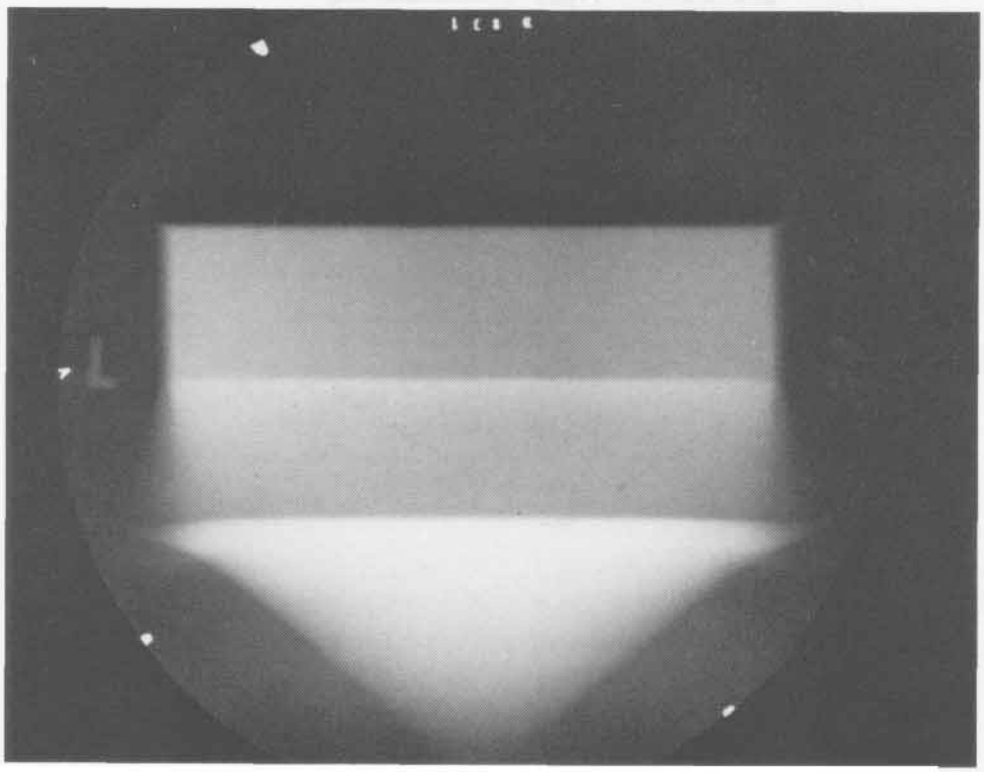


SHOT 831: **Two Adjacent Composition B-3 Detonations**
Date: August 31, 1967
Experimenter: Roger W. Taylor
Radiographic Time: 29.05 μs

Two Composition B-3 detonations were separated by w, the minimum air gap possible between two Composition B-3 blocks. The charges were initiated by a P-081 lens. The detonations ran along the gap for 50.8 mm. h was 50.8 mm.

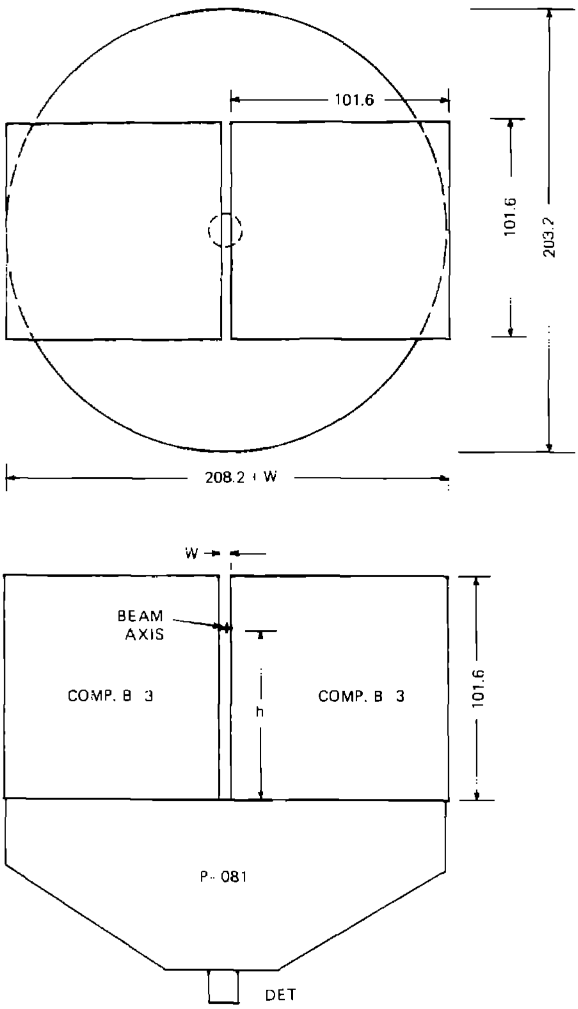


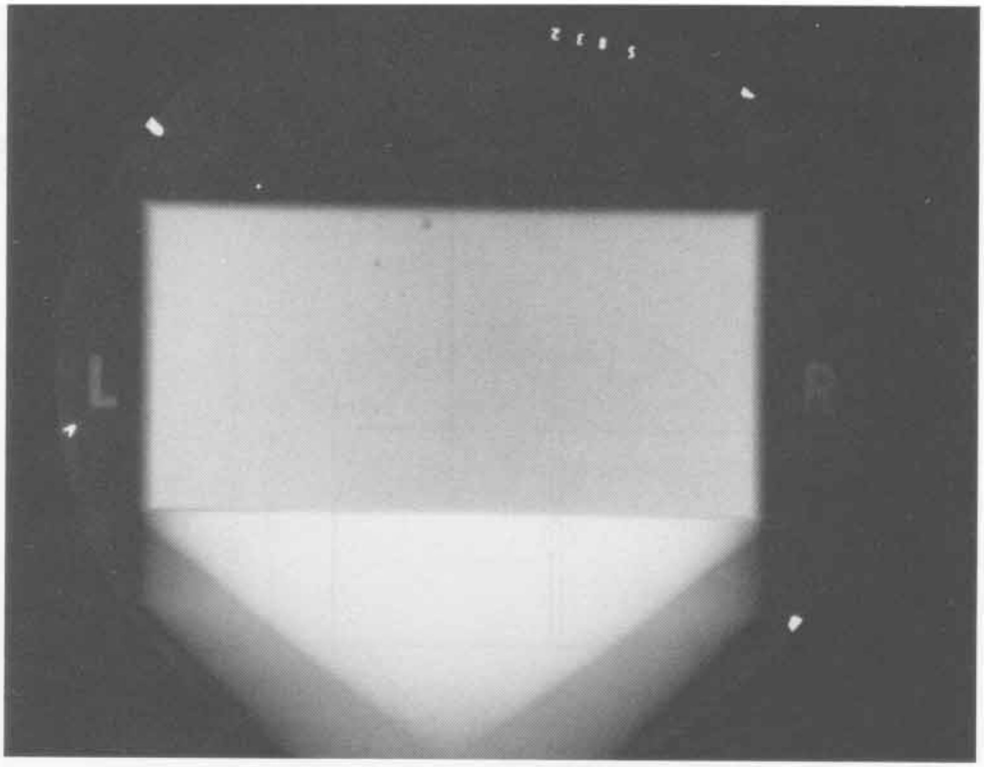




SHOT 832: **Two Adjacent Composition B-3 Detonations**
Date: August 31, 1967
Experimenter: Roger W. Taylor
Radiographic Time: 27.48 μs

Two Composition B-3 detonations were separated by w, the minimum air gap possible between two Composition B-3 blocks. The charges were initiated by a P-081 lens. The detonations ran along 38.1 mm. h is 38.1 mm.

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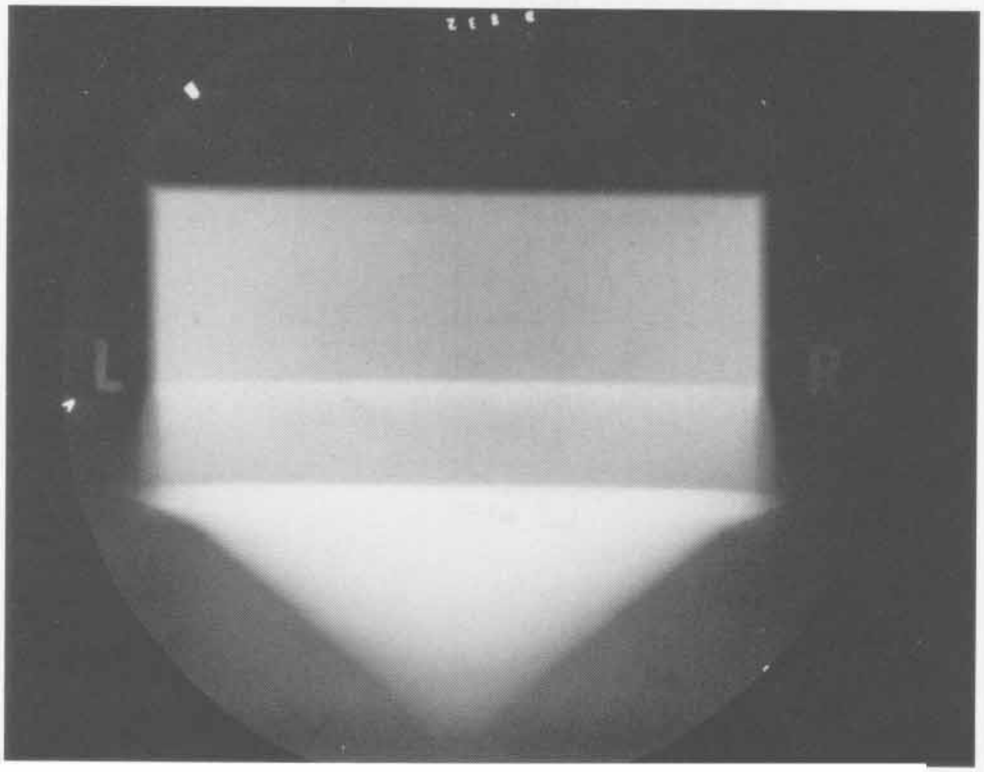
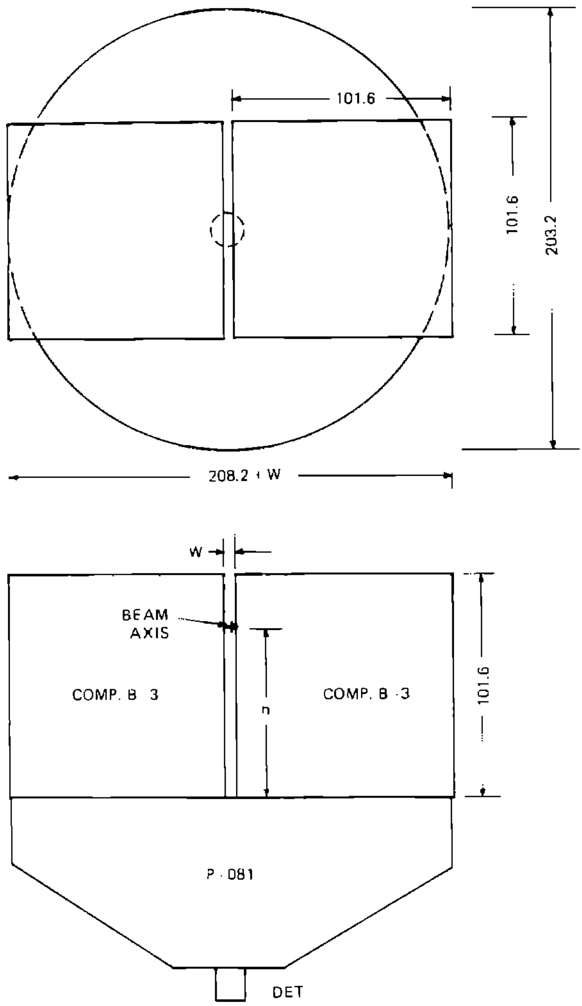
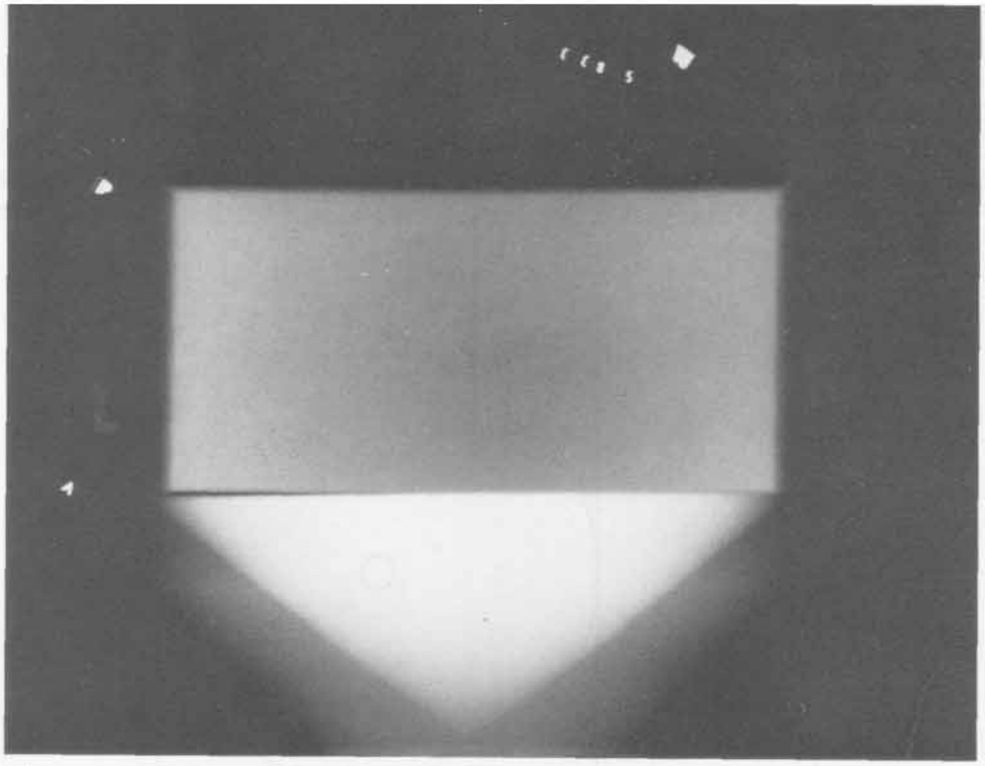

L
R

SHOT 833: **Two Adjacent Composition B-3 Detonations**
Date: September 1, 1967
Experimenter: Roger W. Taylor
Radiographic Time: 25.89 μs

Two Composition B-3 detonations were separated by w, the minimum air gap possible between two Composition B-3 blocks. The charges were initiated by a P-081 lens. The detonations ran 25.4 mm. h is 25.4 mm.

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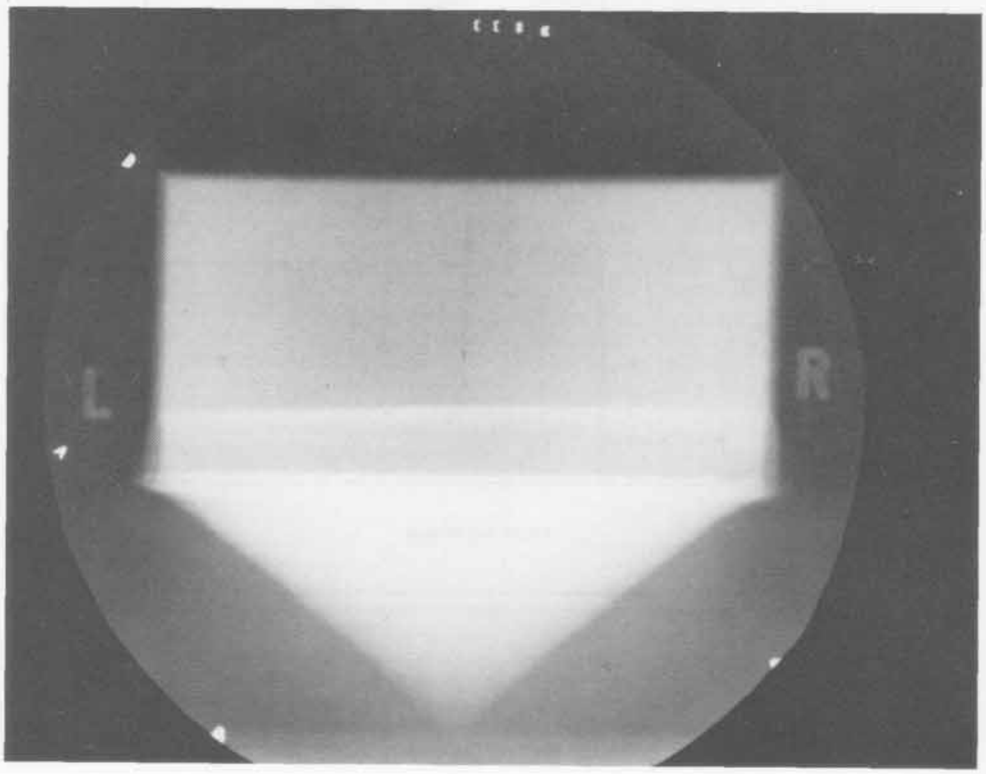
L
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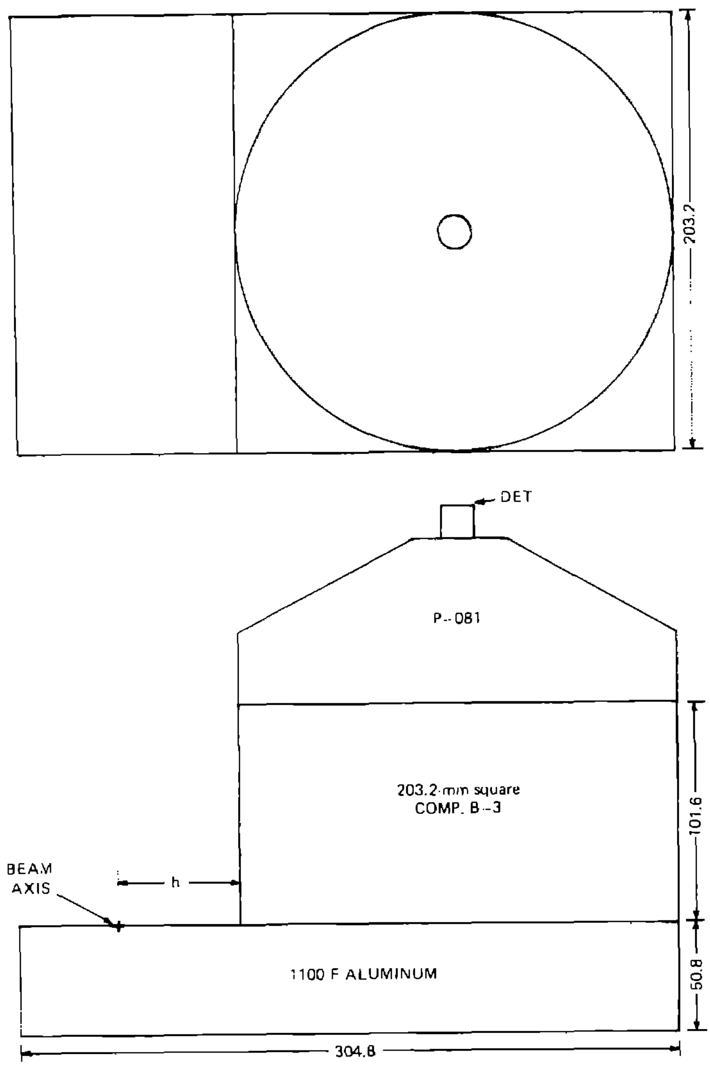
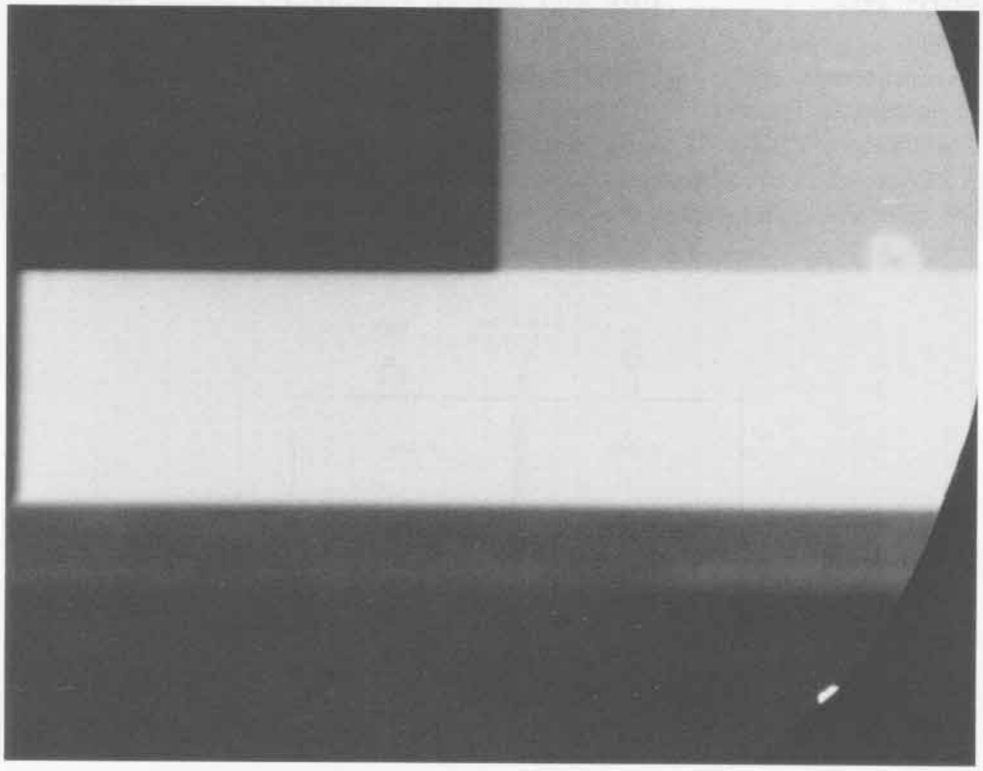
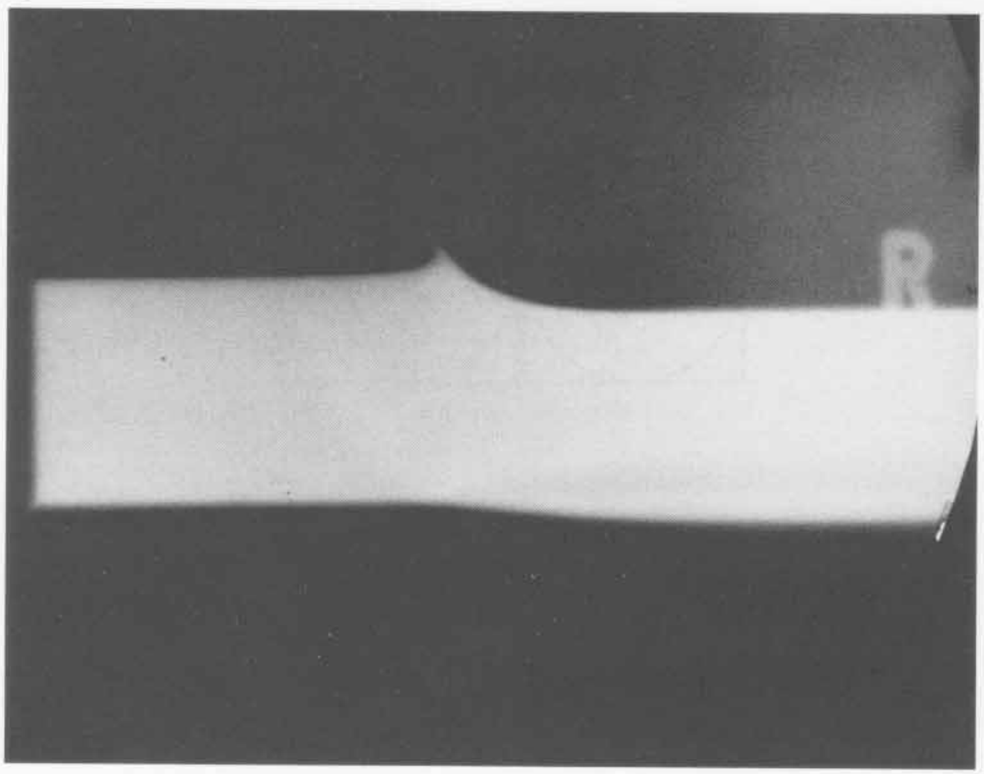
SHOT 834: **Aluminum Splash Wave**
Date: September 1, 1967
Experimenter: Roger W. Taylor
Radiographic Time: 43.95 μs
Reference: Taylor and Venable, 1968

An aluminum splash wave generated by a 101.6-mm-thick by 203.2-mm-square block of detonated Composition B-3 was initiated by a P-081 lens. See also Shot 804. h was 34.13 mm.

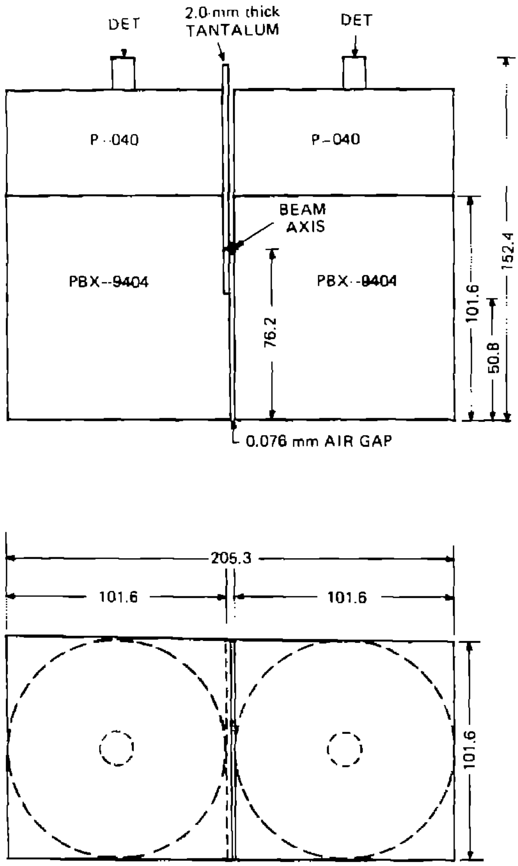


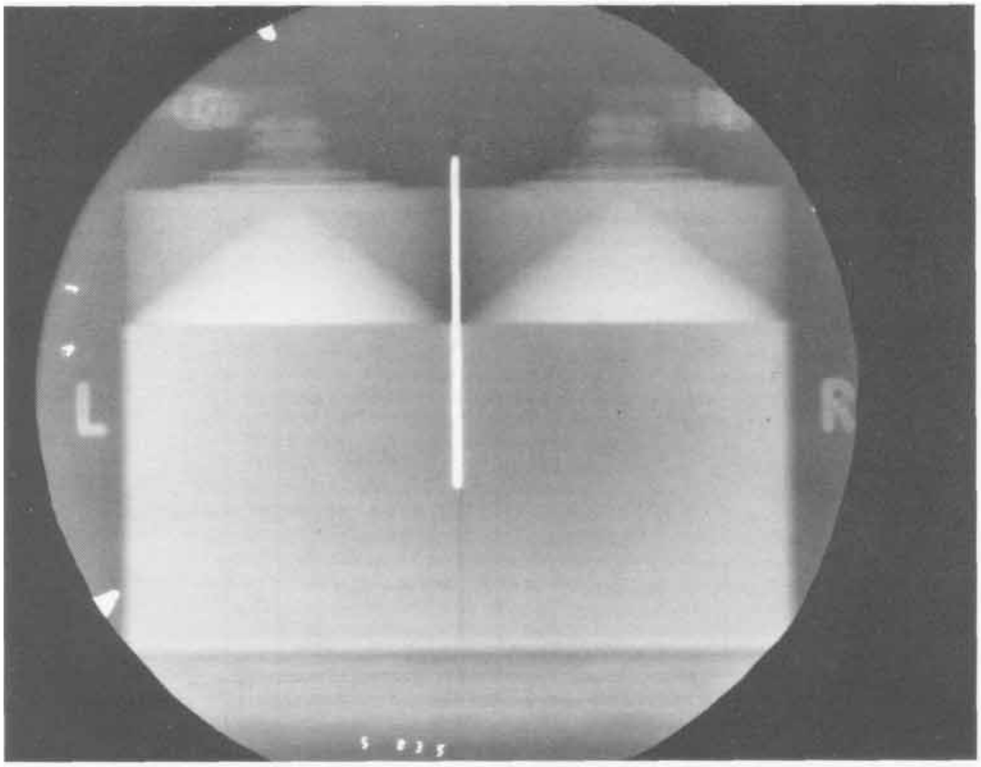



R

SHOT 835: **PBX-9404 with an Embedded Tantalum Plate**
Date: November 8, 1967
Experimenter: Gary W. Rodenz
Radiographic Time: 16.23 μs

Two blocks of PBX-9404 were initiated by two P-040 lenses detonated 0.4 μs apart. A 2.0-mm-thick tantalum plate was placed between the explosive blocks parallel to the direction of detonation wave travel.





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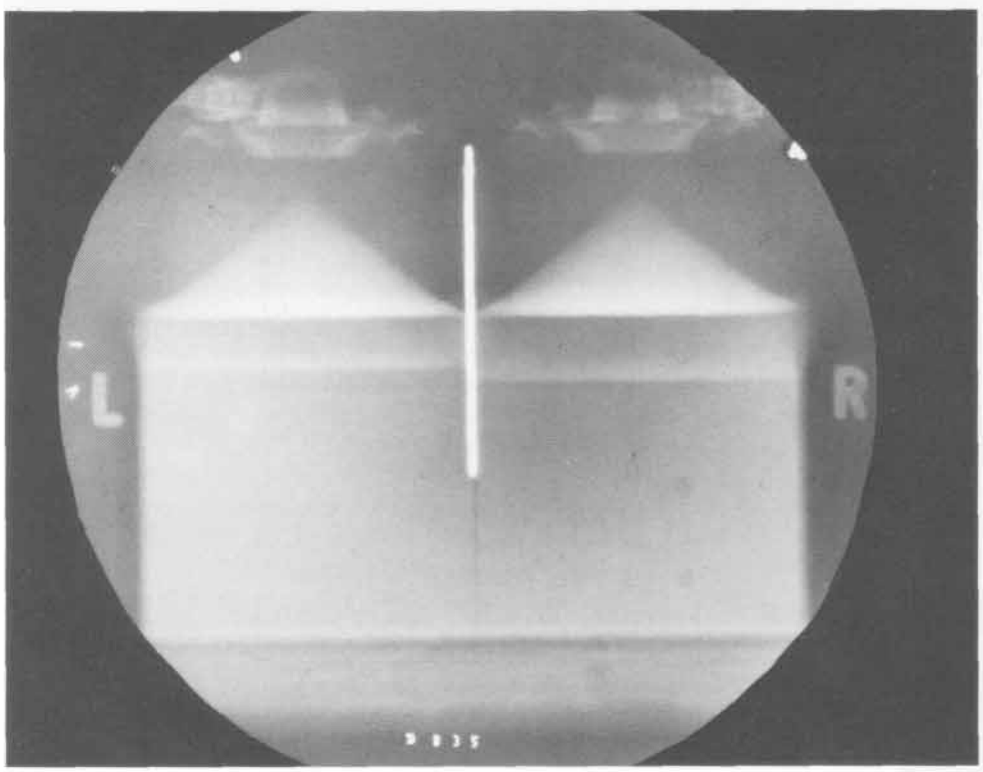
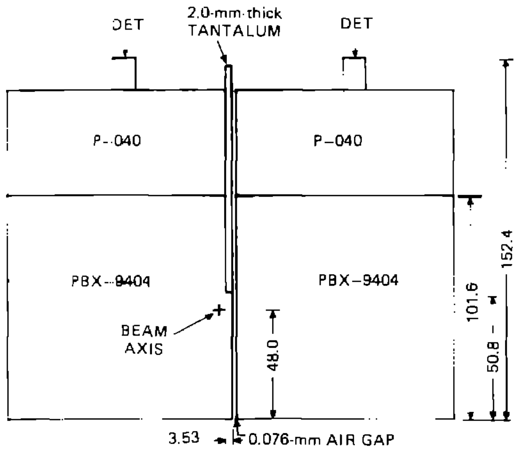
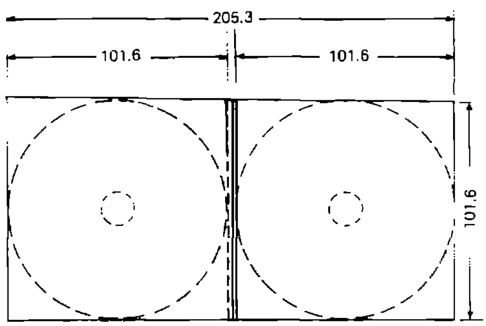


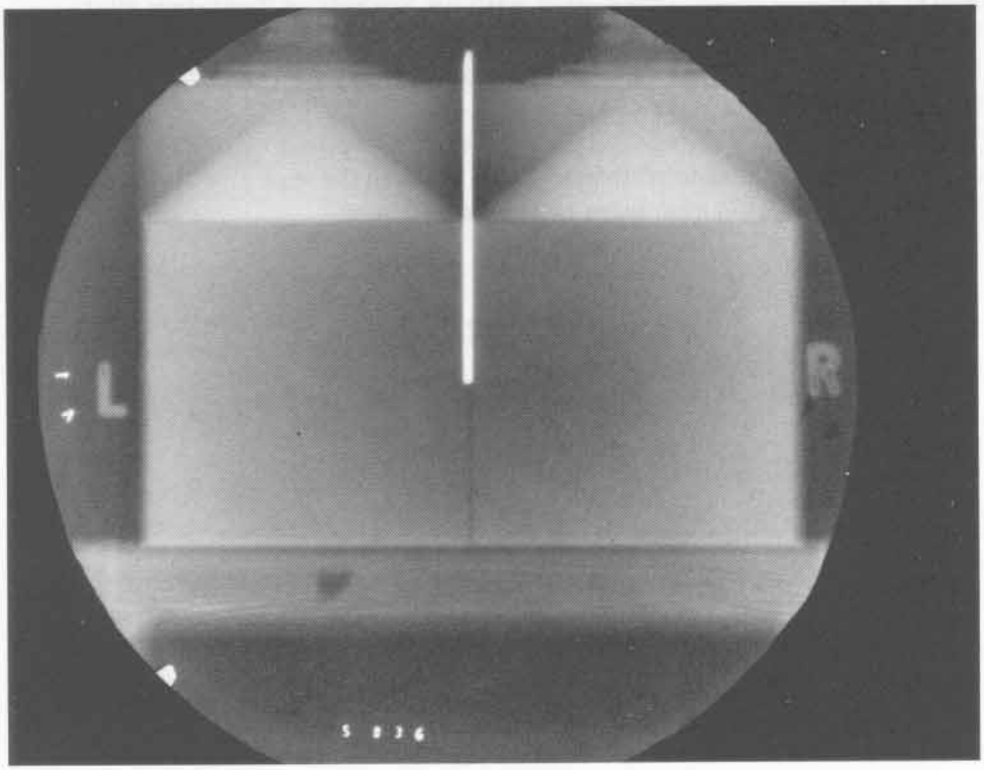
L
R

SHOT 836: **PBX-9404 with an Embedded Tantalum Plate**
Date: November 9, 1967
Experimenter: Gary W. Rodenz
Radiographic Time: 19.97 μs

Two blocks of PBX-9404 were initiated by two P-040 lenses detonated 0.4 μs apart. A 2.0-mm-thick tantalum plate was placed between the explosive blocks parallel to the direction of detonation wave travel for 50.8 mm.







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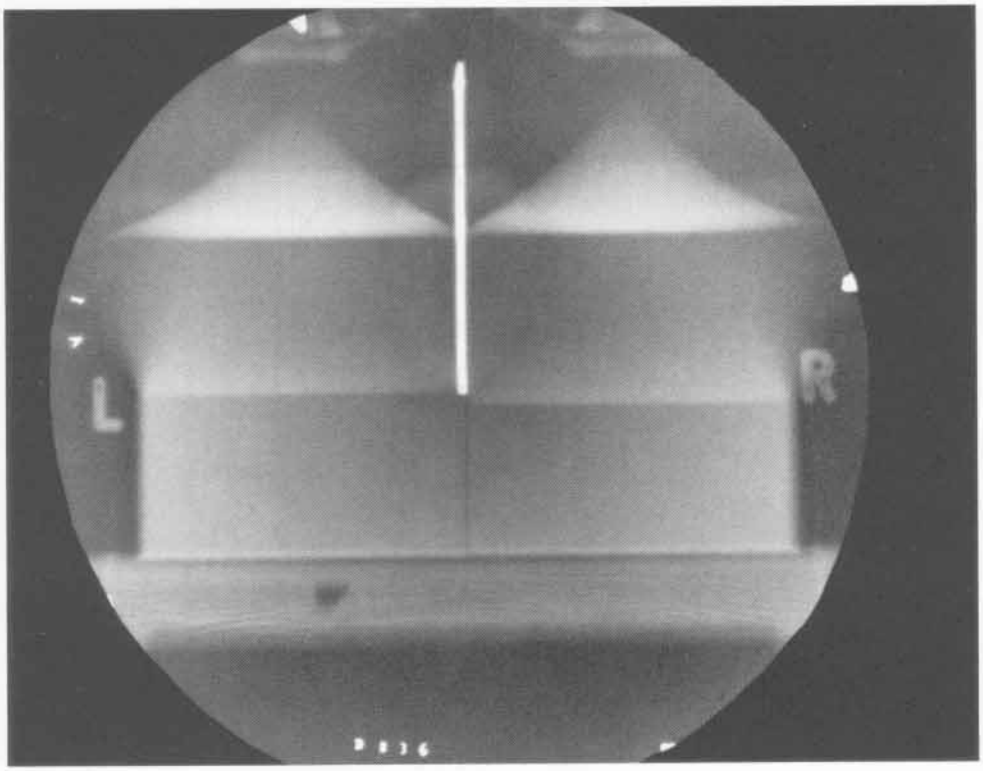

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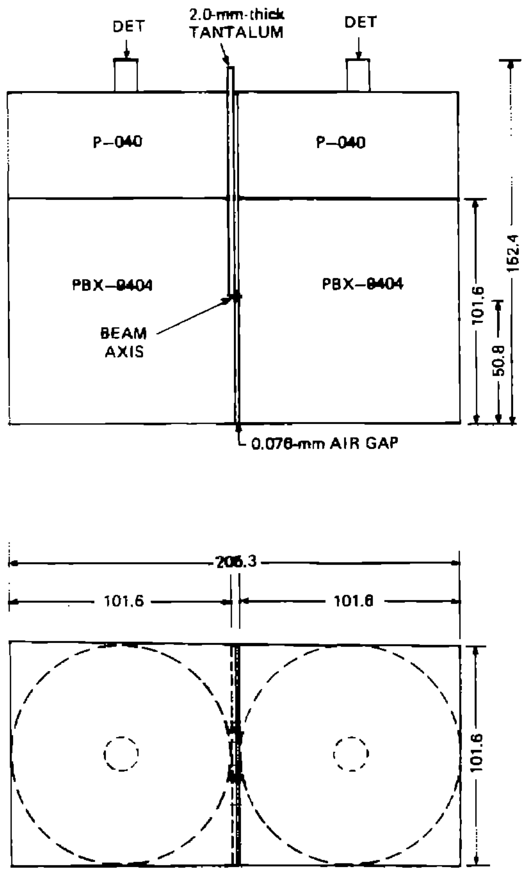
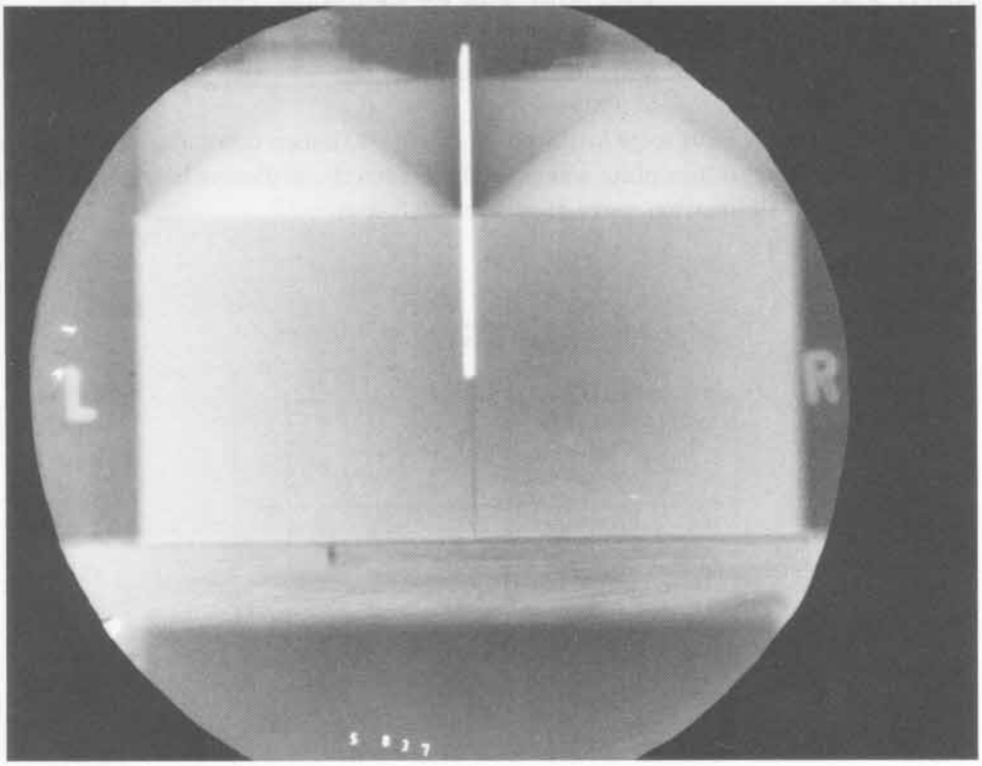
SHOT 837: **PBX-9404 with an Embedded Tantalum Plate**
Date: November 8, 1967
Experimenter: Gary W. Rodenz
Radiographic Time: 19.52 μs

Two blocks of PBX-9404 were initiated by two P-040 lenses detonated 0.4 μs apart. A 2.0-mm-thick tantalum plate was placed between the explosive blocks parallel to the direction of detonation wave travel for 50.8 mm.

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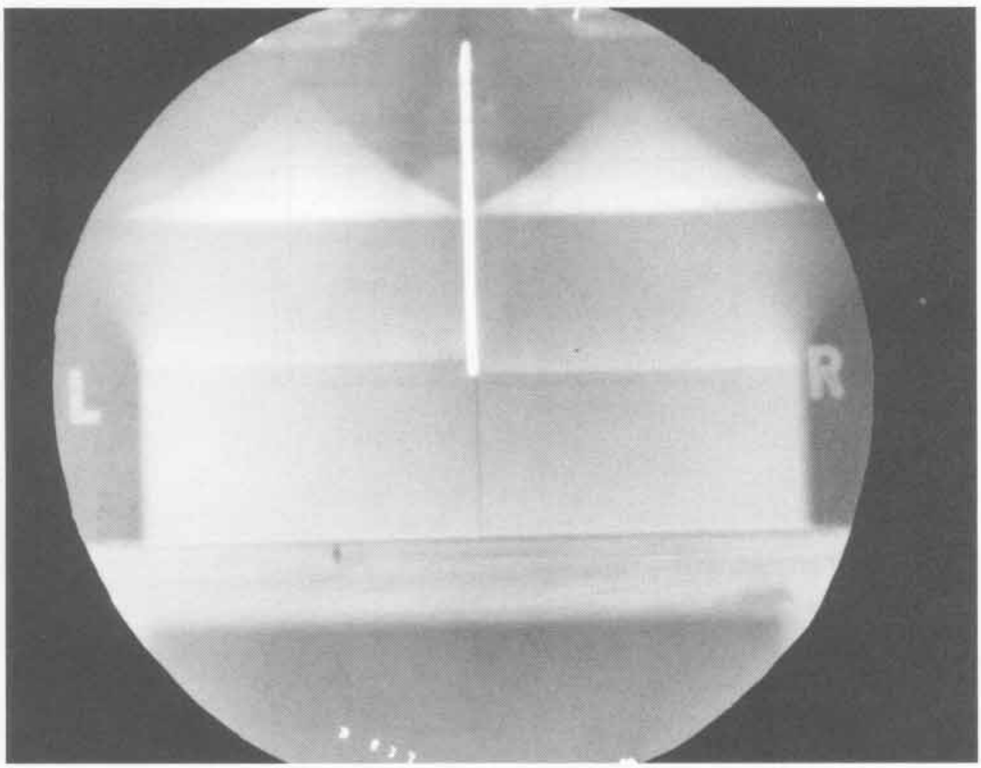
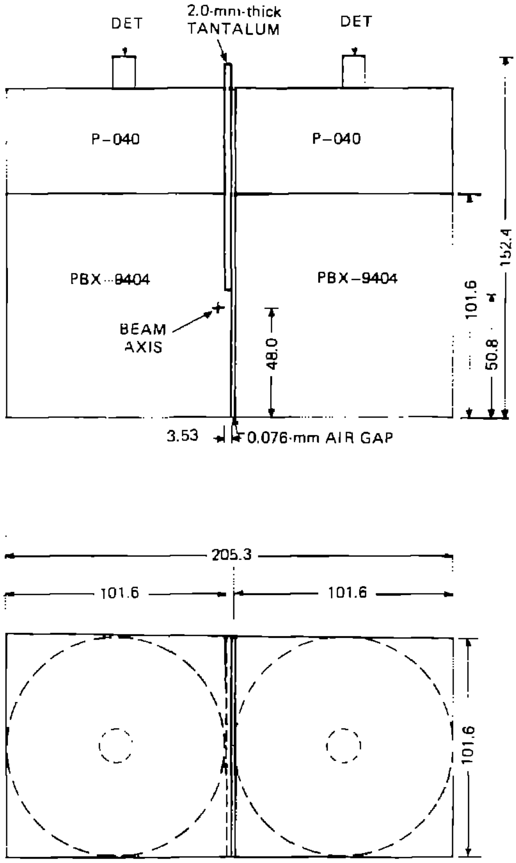
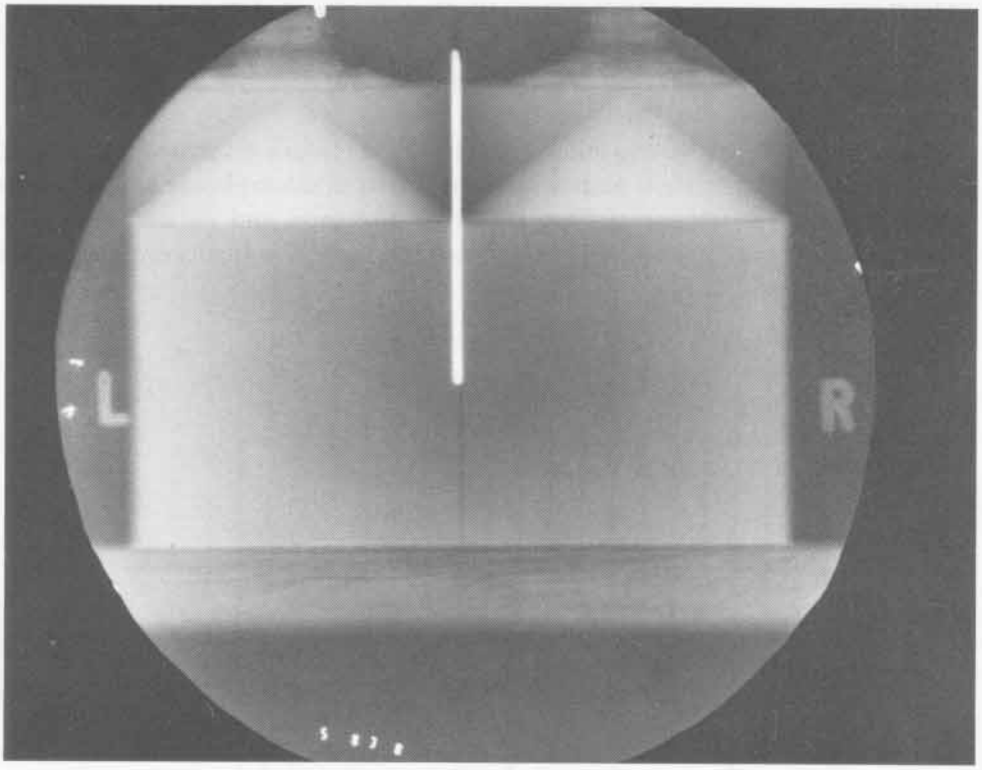

L
R

SHOT 838: **PBX-9404 with an Embedded Tantalum Plate**
Date: November 21, 1967
Experimenter: Gary W. Rodenz
Radiographic Time: 20.08 μs

Two blocks of PBX-9404 were initiated by two P-040 lenses detonated 0.4 μs apart. A 2.0-mm-thick tantalum plate was placed between the explosive blocks parallel to the direction of detonation wave travel for 50.8 mm.

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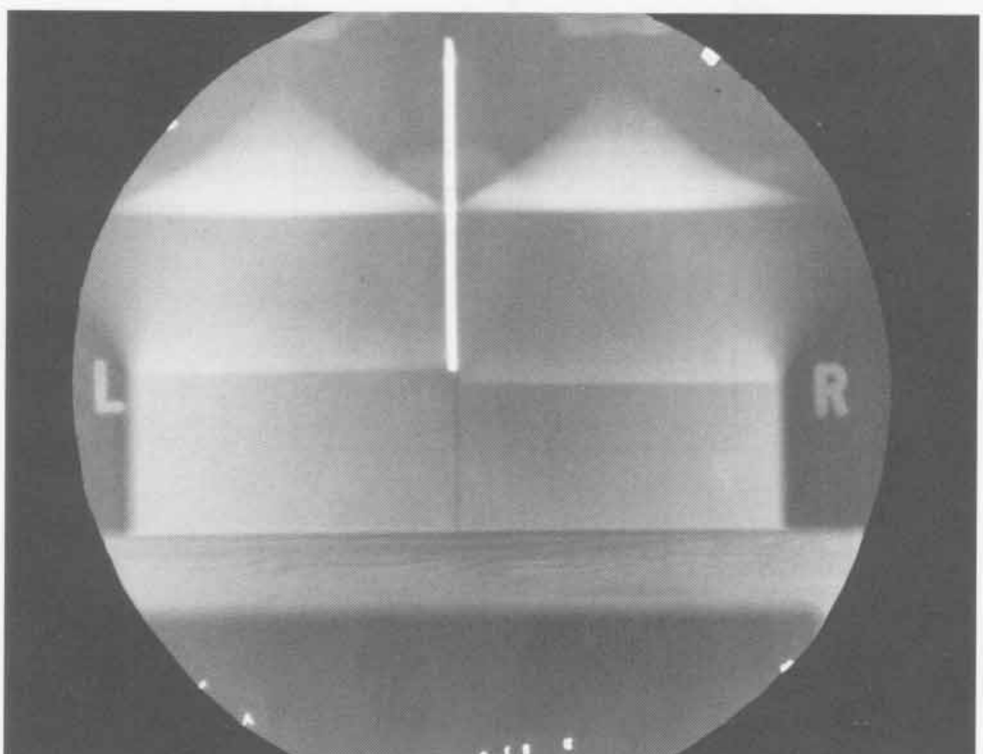
L
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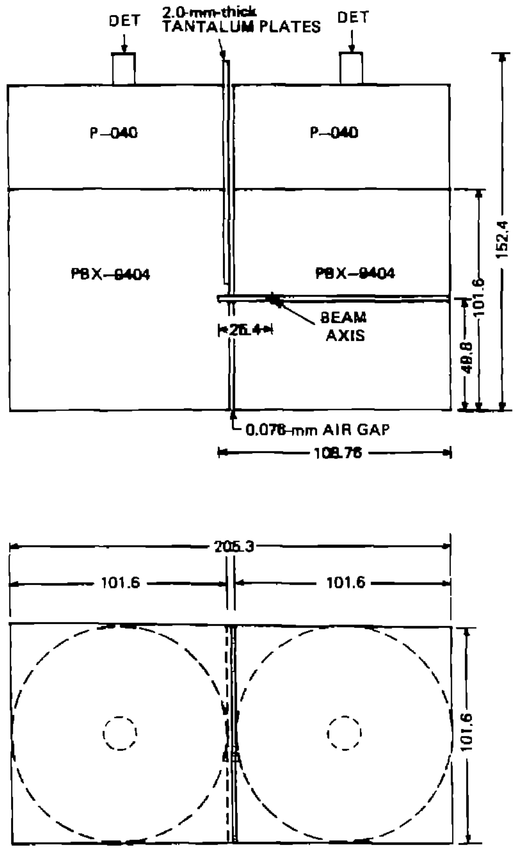
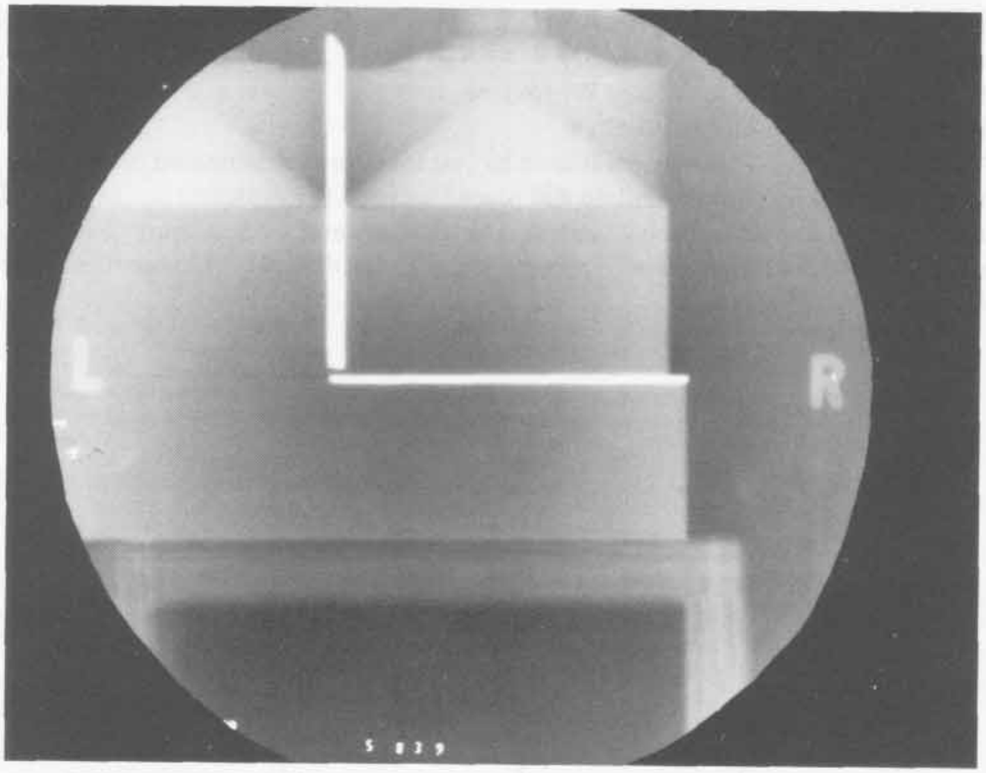
SHOT 839: **PBX-9404 with Two Embedded Tantalum Plates**
Date: January 11, 1968
Experimenter: Gary W. Rodenz
Radiographic Time: 20.31 μs

Two blocks of PBX-9404 were initiated by two P-040 lenses detonated 0.4 μs apart. One 2.0-mm-thick tantalum plate was placed between the explosive blocks parallel to the direction of detonation wave travel for 48.8 mm and 2.0 mm below that plate, another 2.0-mm-thick plate was perpendicular to the direction of detonation wave travel for 108.76 mm.

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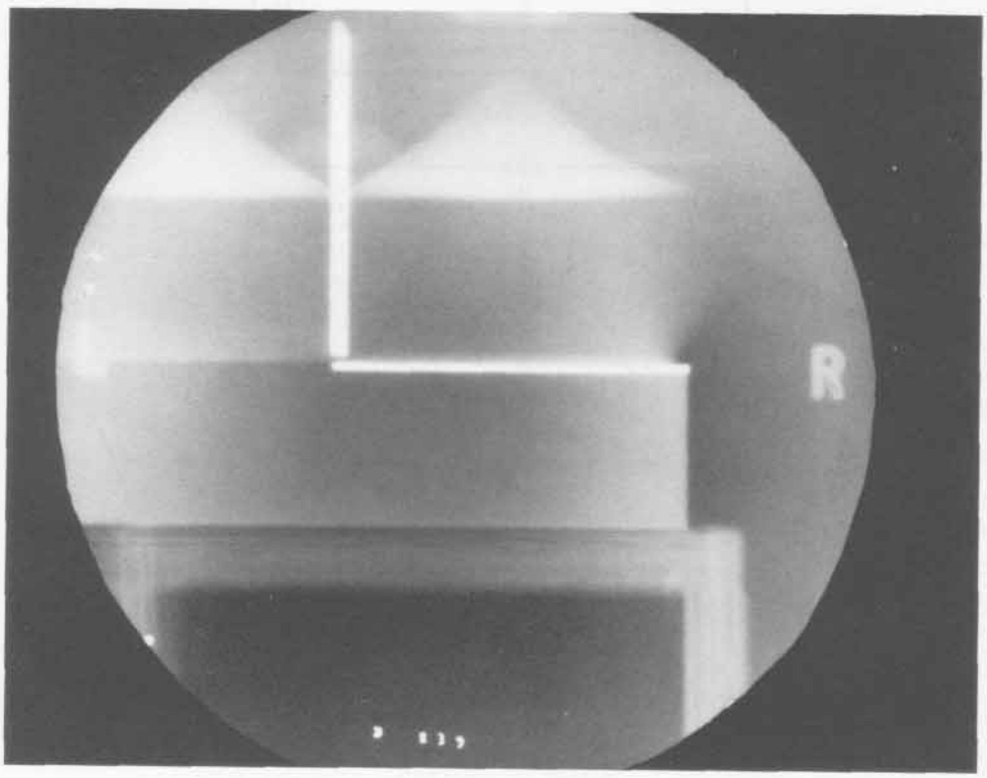

R

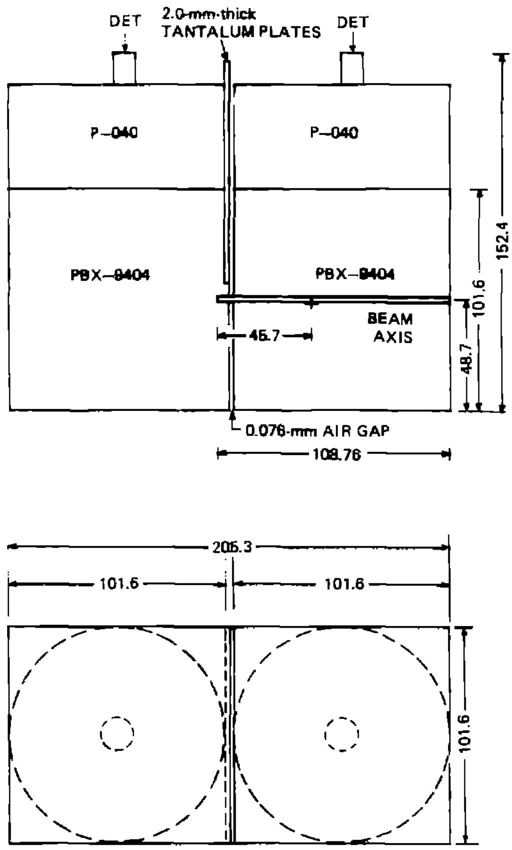
SHOT 840: **PBX-9404 with Two Embedded Tantalum Plates**

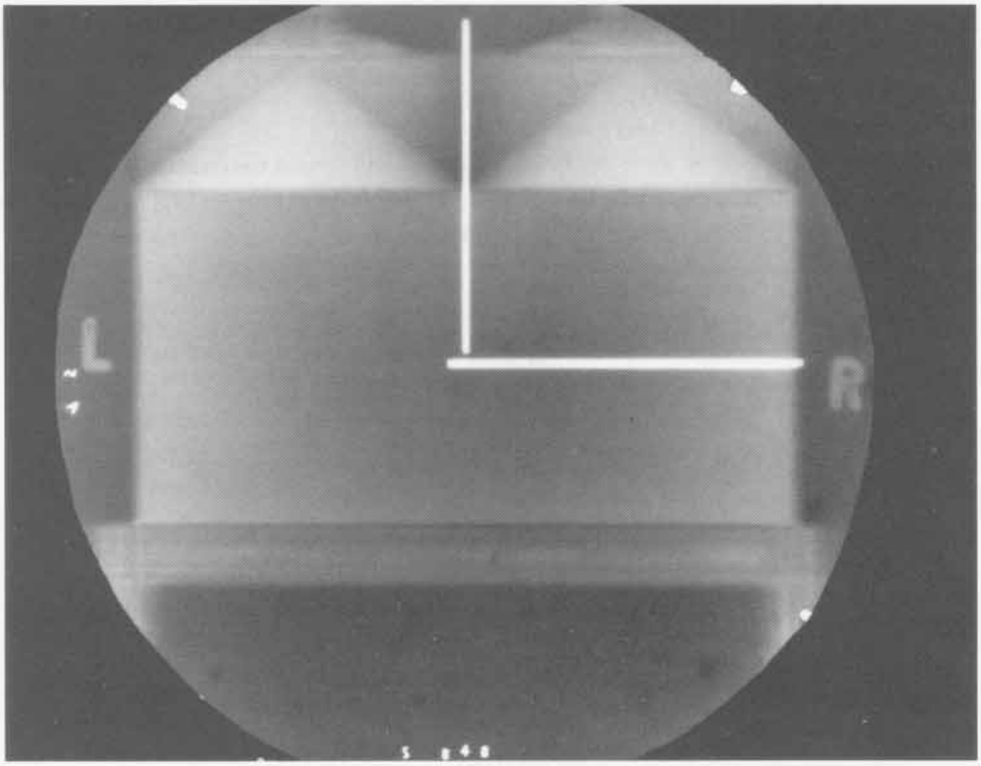
Date: February 7, 1968

Experimenter: Gary W. Rodenz

Radiographic Time: 20.48 μs

Two blocks of PBX-9404 were initiated by two P-040 lenses detonated 0.4 μs apart. One 2.0-mm-thick tantalum plate was placed between the explosive blocks parallel to the direction of detonation wave travel for 48.8 mm and 2.0 mm below that plate, another 2.0-mm-thick plate was perpendicular to the direction of detonation wave travel for 108.76 mm.

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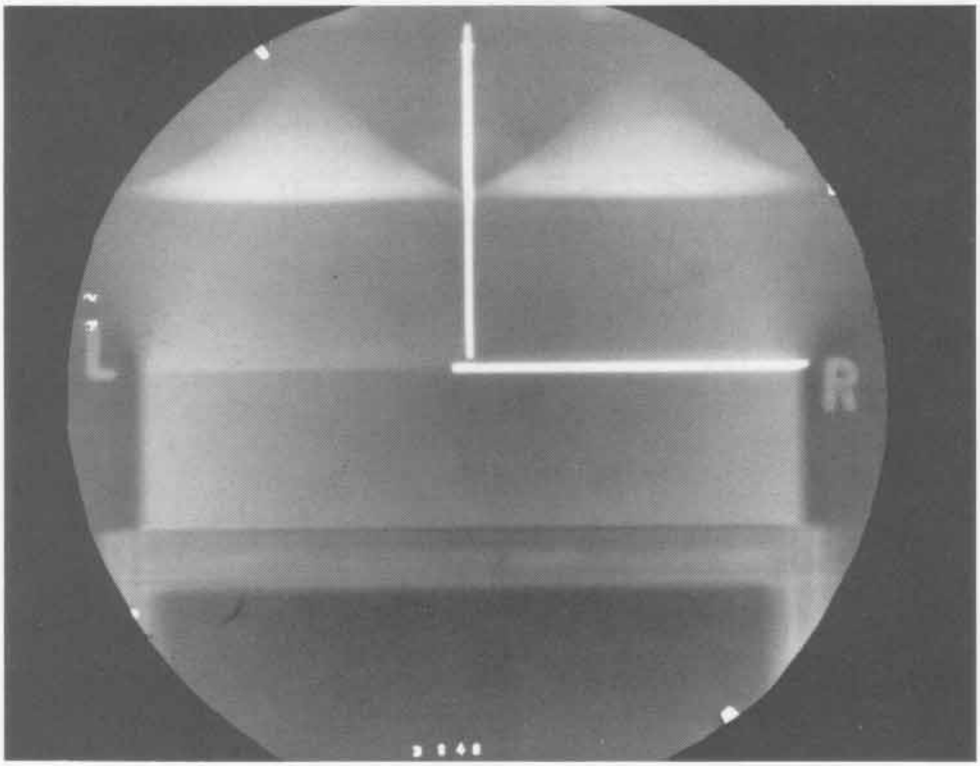
L
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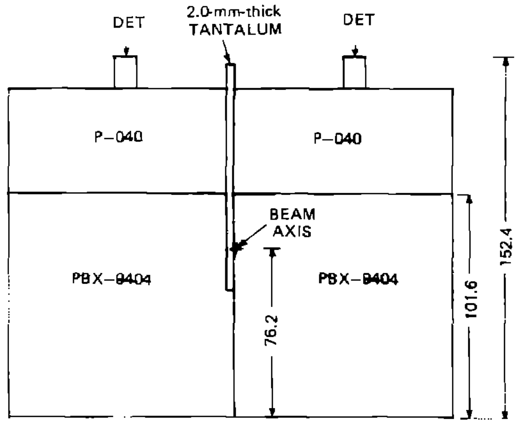
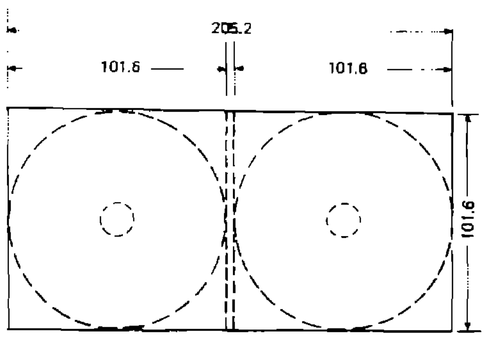
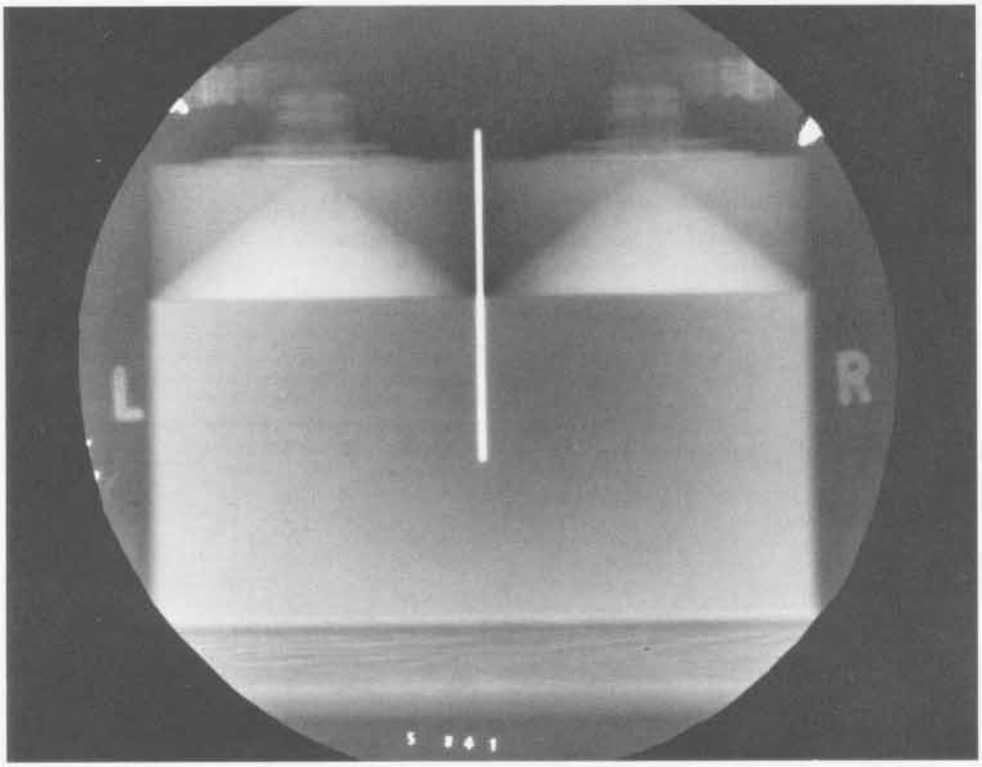
SHOT 841: **PBX-9404 with an Embedded Tantalum Plate**
Date: November 21, 1967
Experimenter: Gary W. Rodenz
Radiographic Time: 16.21 μs

Two blocks of PBX-9404 were initiated by two P-040 lenses detonated 0.4 μs apart. A 2.0-mm-thick tantalum plate was placed between the explosive blocks parallel to the direction of detonation wave travel for 50.8 mm.



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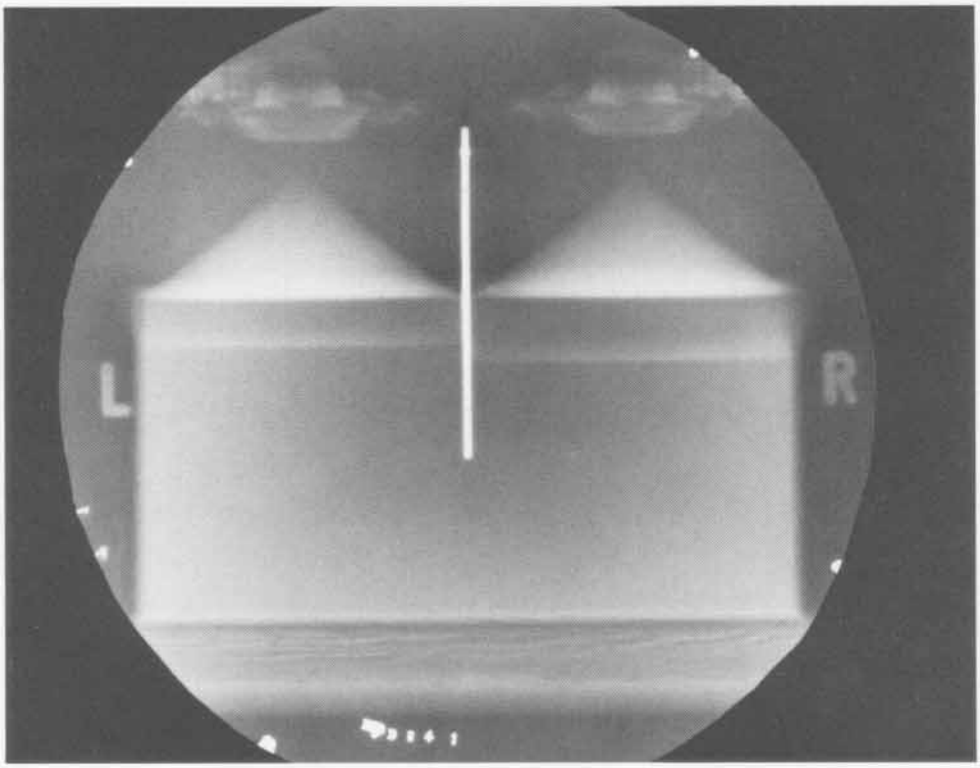
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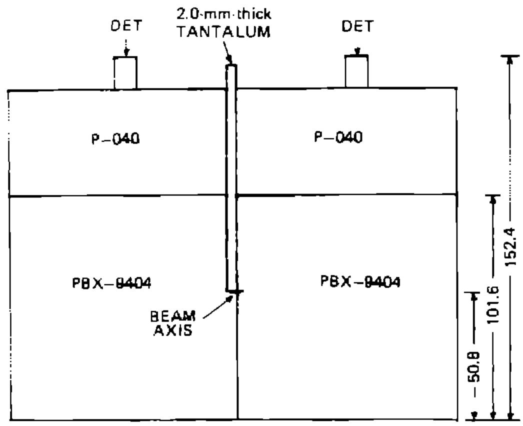
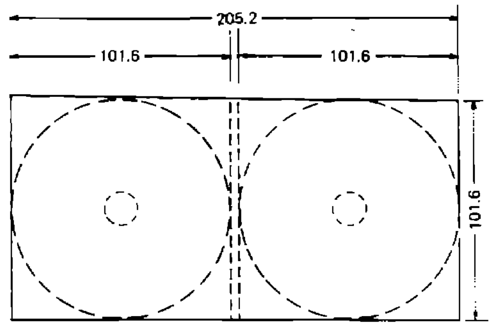
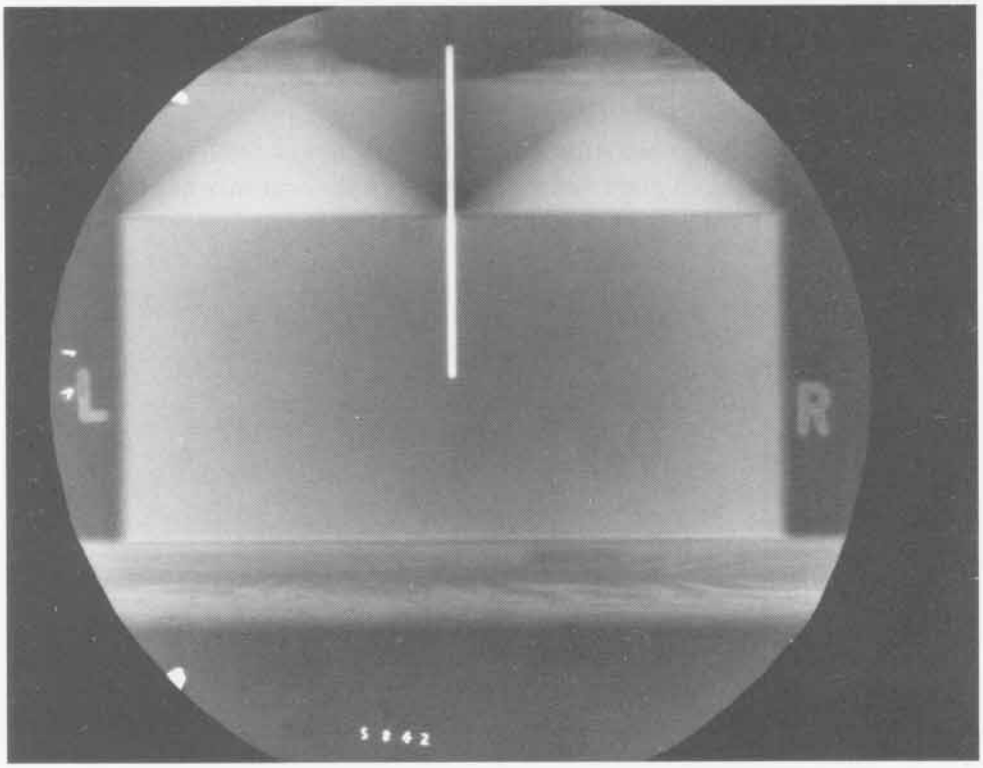
SHOT 842:	**PBX-9404 with an Embedded Tantalum Plate**
Date:	November 22, 1967
Experimenter:	Gary W. Rodenz
Radiographic Time:	19.98 μs

Two blocks of PBX-9404 were initiated by two P-040 lenses detonated 0.4 μs apart. A 2.0-mm-thick tantalum plate was placed between the explosive blocks parallel to the direction of detonation wave travel for 50.8 mm.



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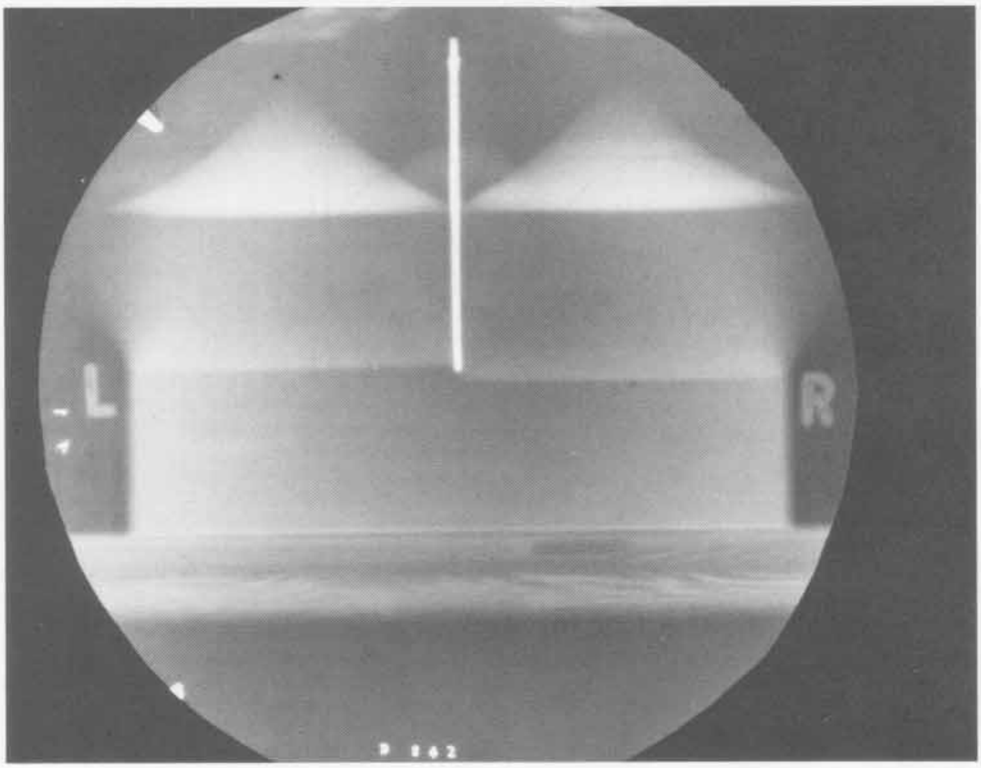
L
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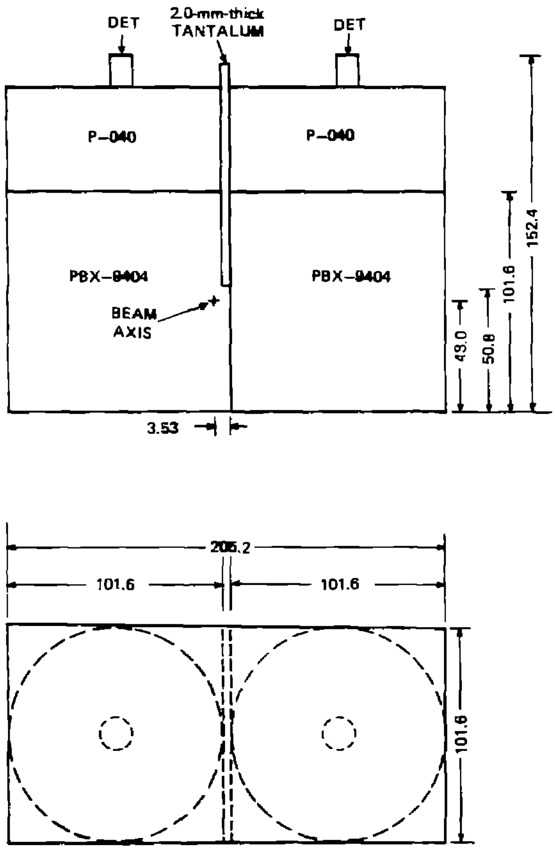
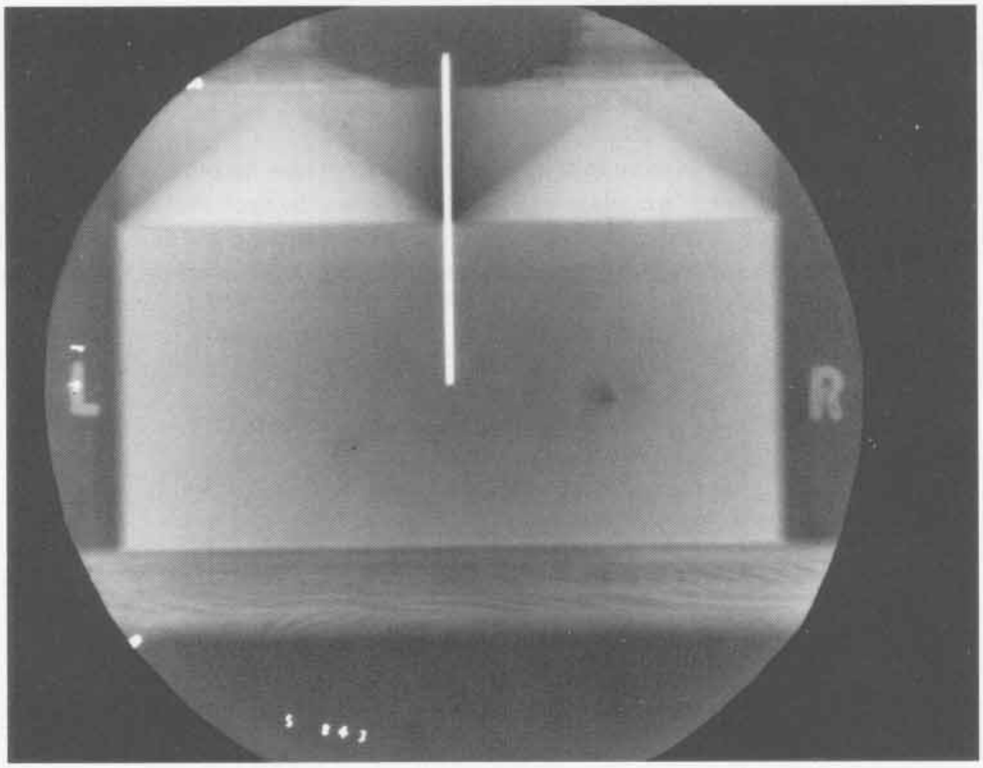
SHOT 843: **PBX-9404 with an Embedded Tantalum Plate**
Date: November 22, 1967
Experimenter: Gary W. Rodenz
Radiographic Time: 20.04 μs

Two blocks of PBX-9404 were initiated by two P-040 lenses detonated 0.4 μs apart. A 2.0-mm-thick tantalum plate was placed between the explosive blocks parallel to the direction of detonation wave travel for 50.8 mm.

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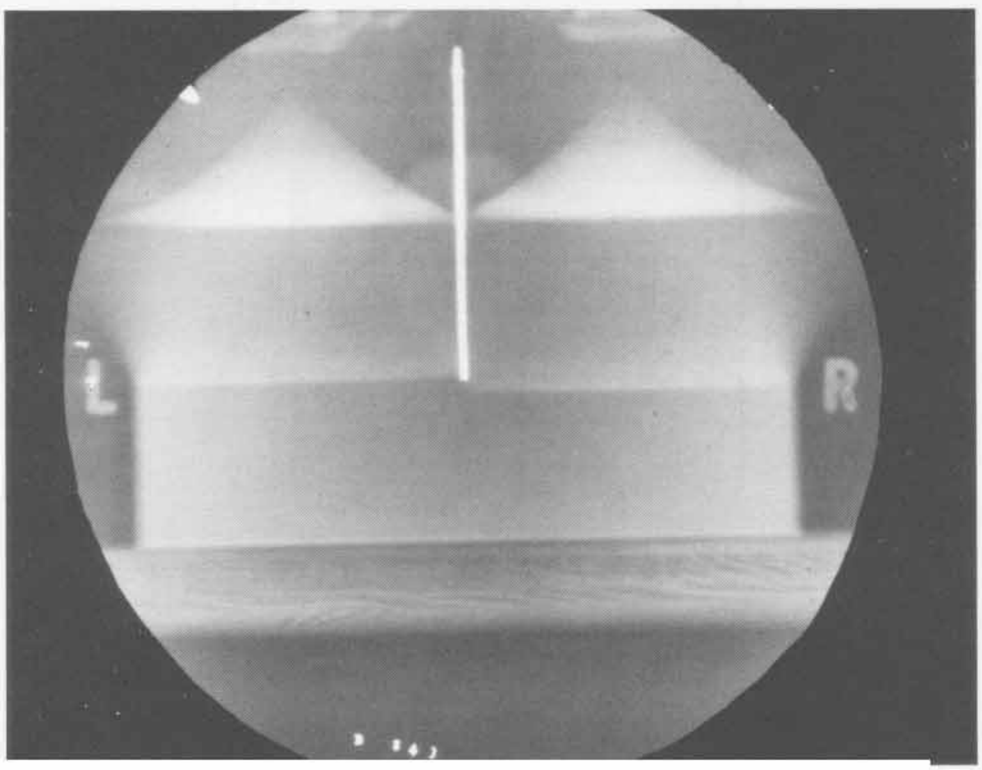
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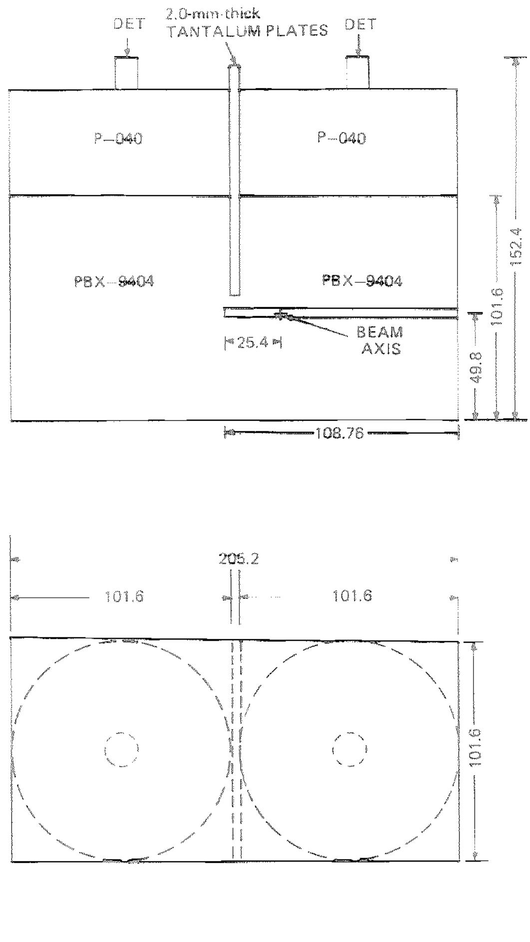
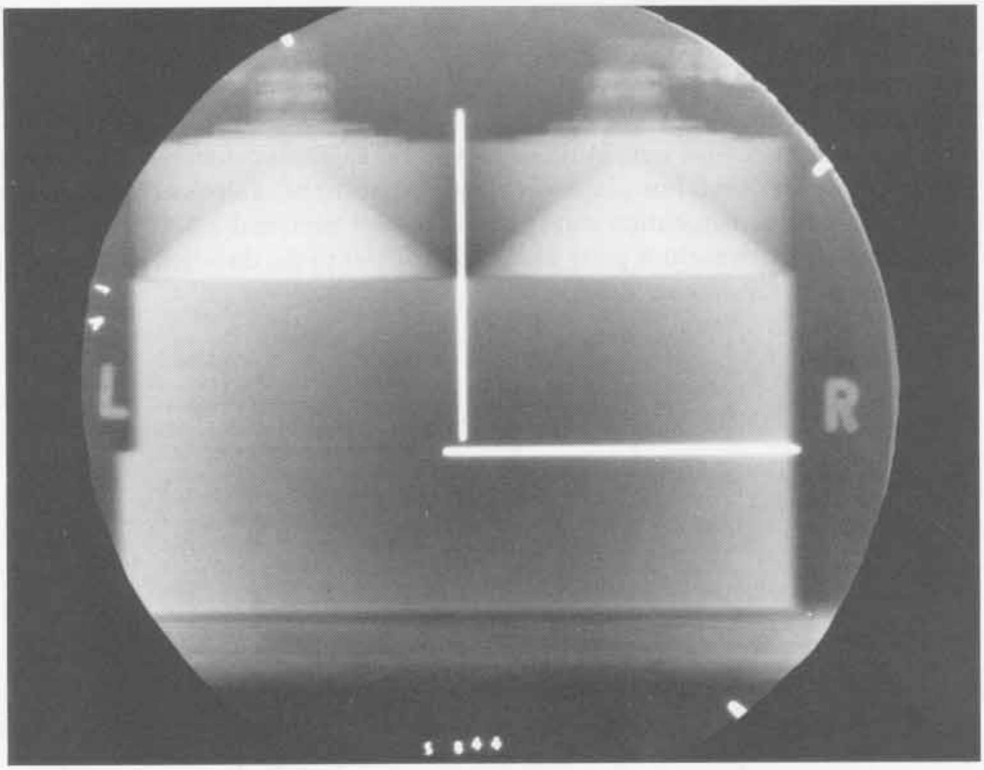
SHOT 844: **PBX-9404 with Two Embedded Tantalum Plates**
Date: February 7, 1968
Experimenter: Gary W. Rodenz
Radiographic Time: 20.32 μs

Two blocks of PBX-9404 were initiated by two P-040 lenses detonated 0.4 μs apart. One 2.0-mm-thick tantalum plate was placed between the explosive blocks parallel to the direction of detonation wave travel for 48.8 mm and 2.0 mm below that plate, another 2.0-mm-thick plate was perpendicular to the direction of detonation wave travel for 108.76 mm.

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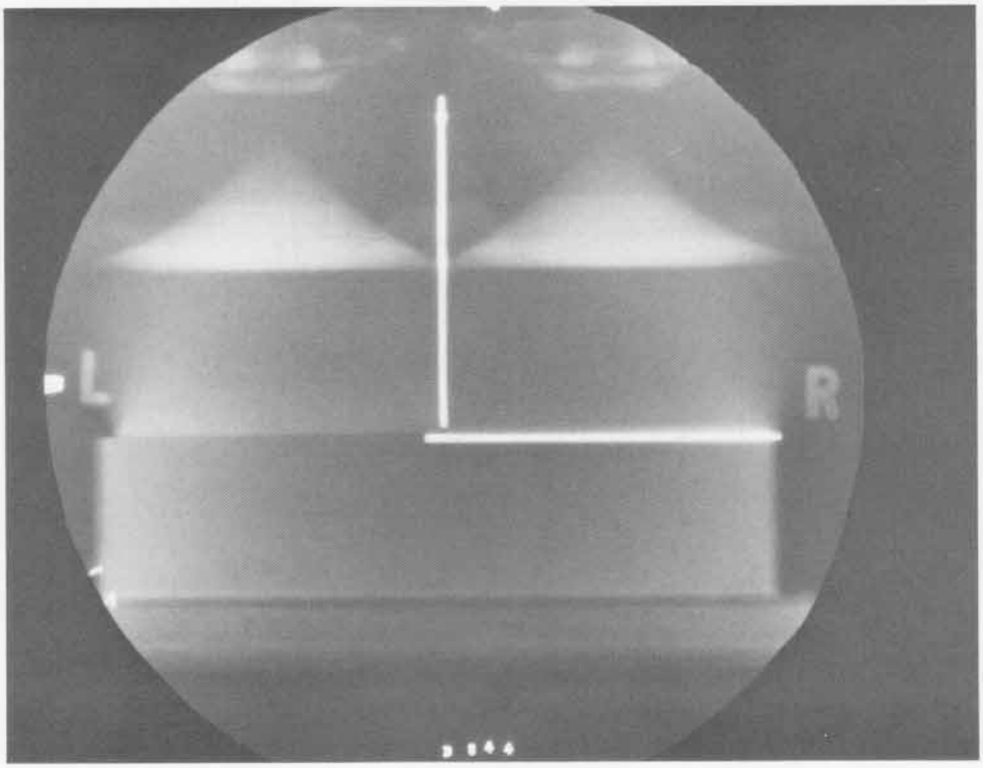
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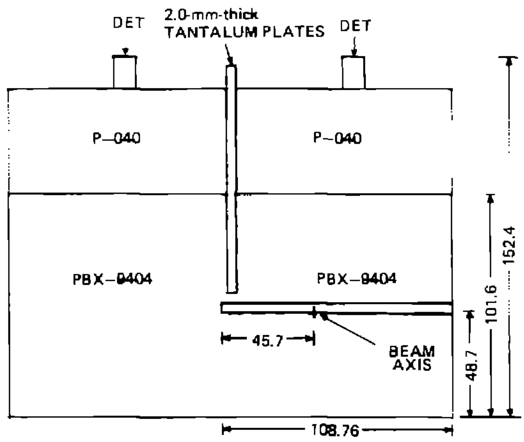
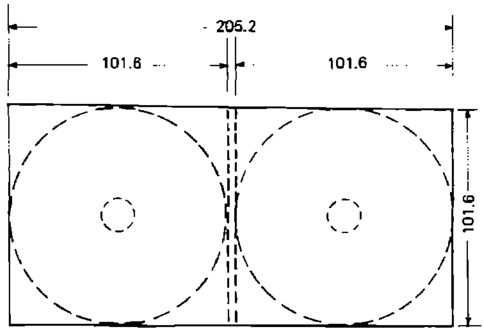
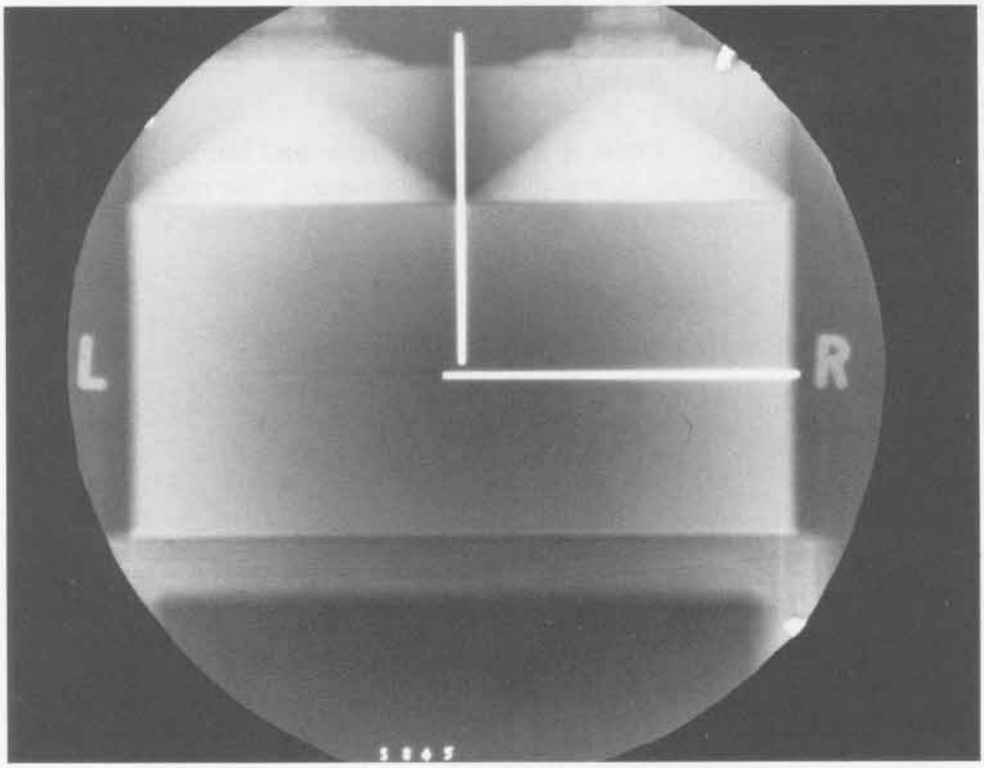
SHOT 845: **PBX-9404 with Two Embedded Tantalum Plates**
Date: March 28, 1968
Experimenter: Gary W. Rodenz
Radiographic Time: 20.35 μs

Two blocks of PBX-9404 were initiated by two P-040 lenses detonated 0.4 μs apart. One 2.0-mm-thick tantalum plate was placed between the explosive blocks parallel to the direction of detonation wave travel for 48.8 mm and 2.0 mm below that plate, another 2.0-mm-thick plate was perpendicular to the direction of detonation wave travel for 108.76 mm.



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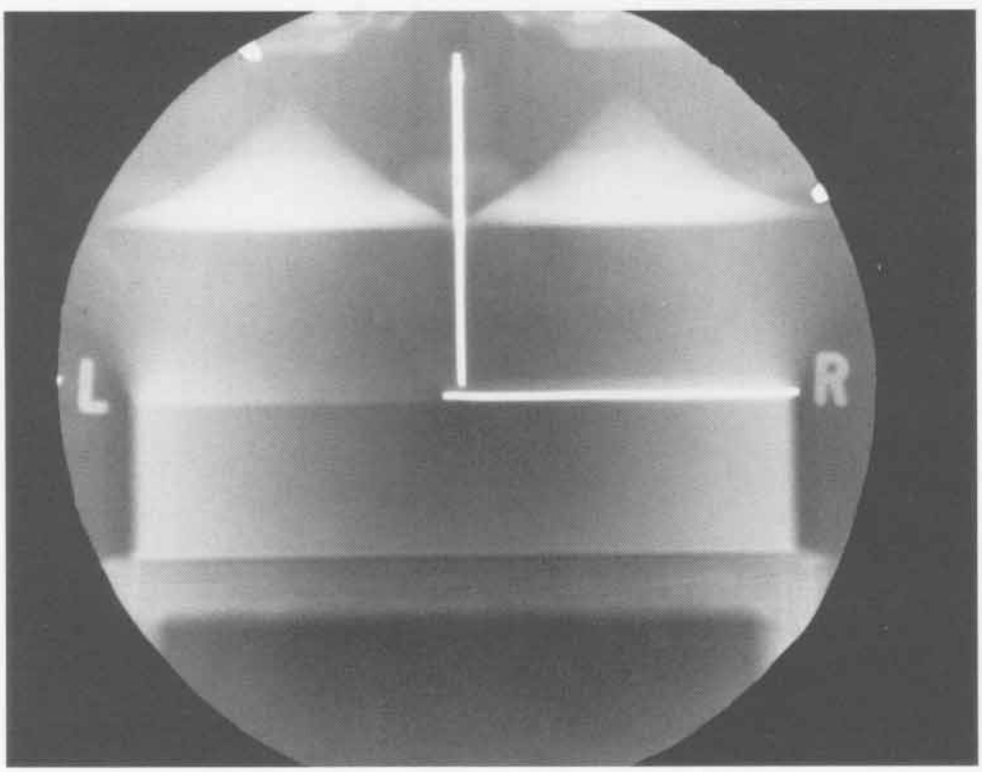
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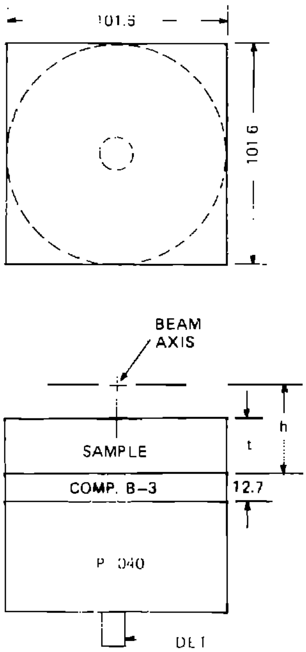
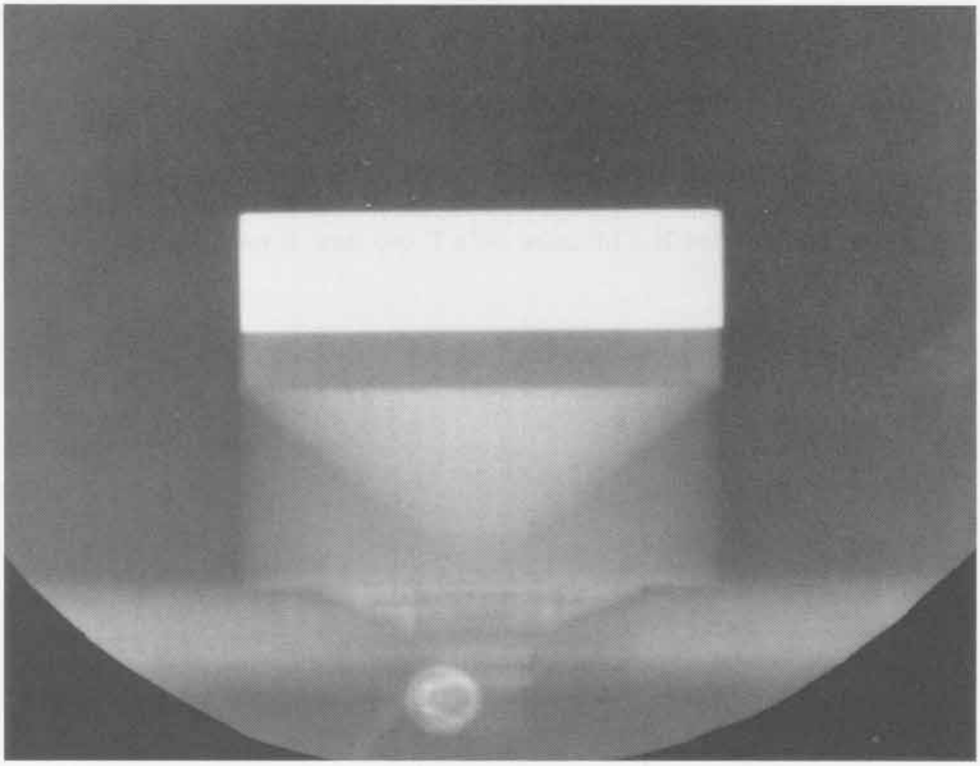
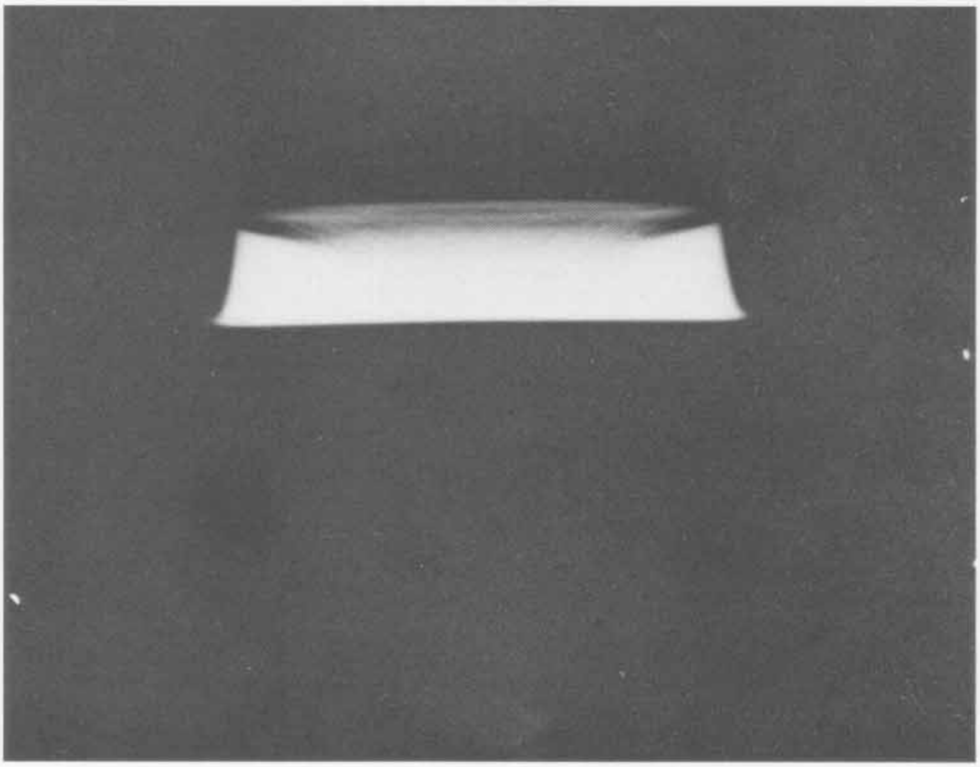
SHOT 857: **Dynamic Fracture of Nickel**
Date: November 22, 1967
Experimenter: Roger W. Taylor
Radiographic Time: 27.26 μs
References: Breed et al., 1967; Thurston and Mudd, 1968

Nickel of 25.0-mm thickness, t, was dynamically fractured. The plate was shocked by 12.7 mm of Composition B-3 initiated by a P-040 lens. h was 38.1 mm.







SHOT 858: **Dynamic Fracture of Nickel**

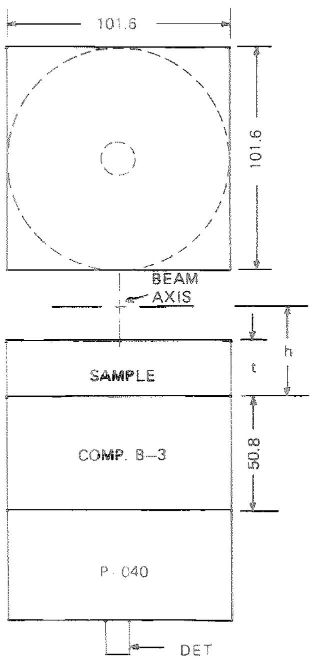
Date: February 14, 1968

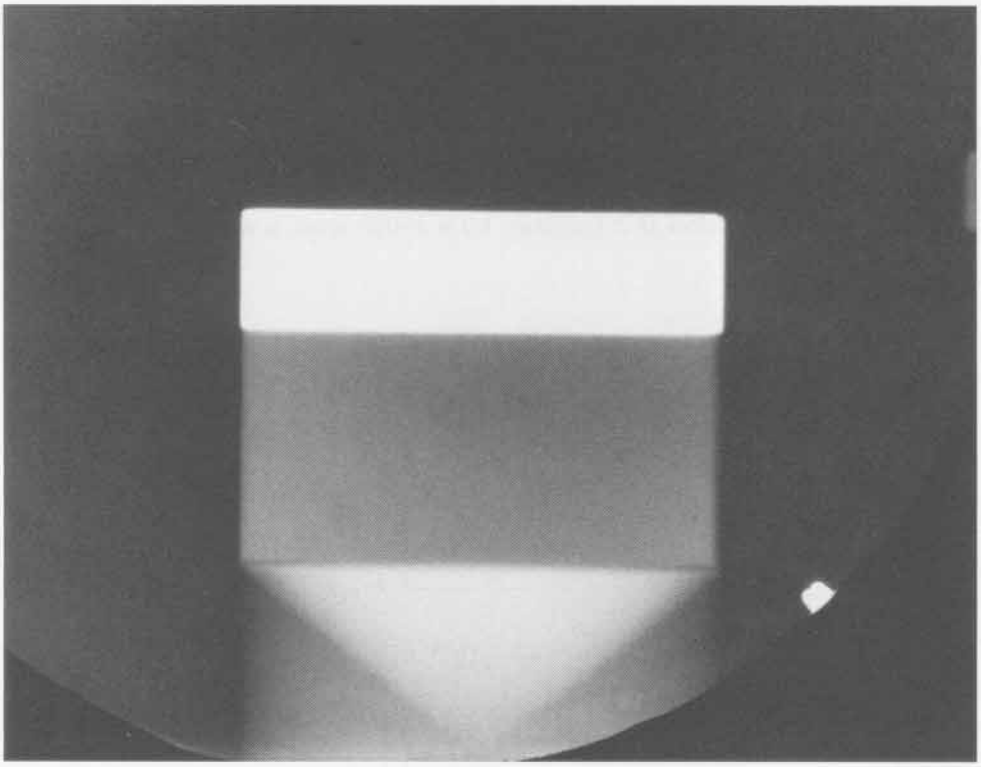
Experimenter: Roger W. Taylor

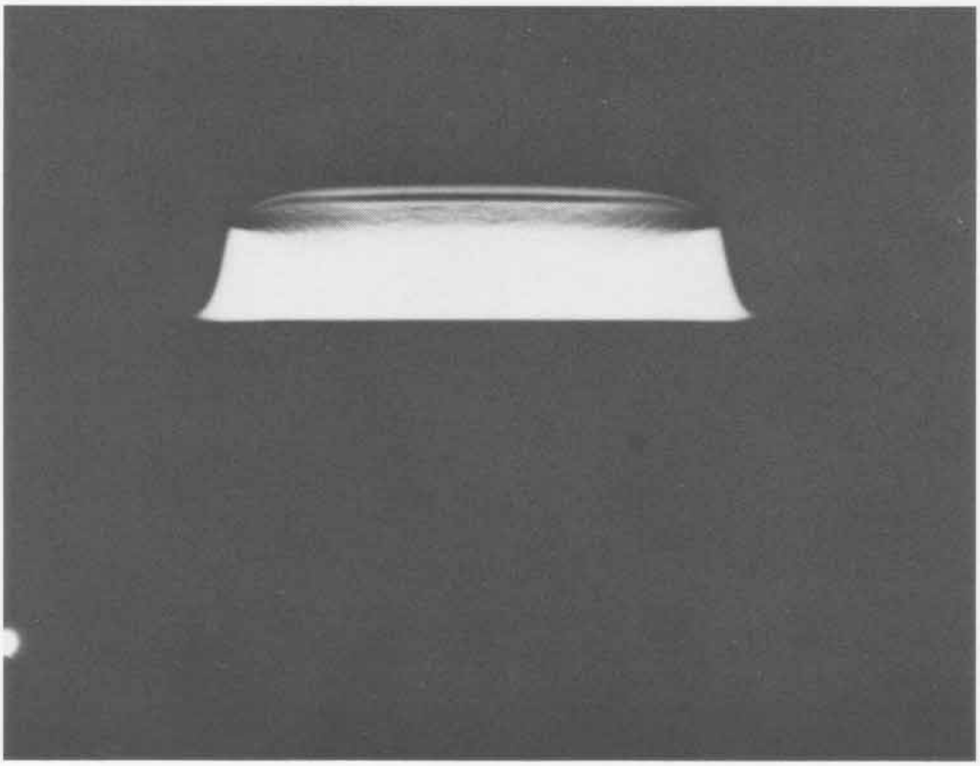
Radiographic Time: 32.03 μs

References: Breed et al., 1967; Thurston and Mudd, 1968

Nickel of 25-mm thickness, t, was dynamically fractured. The plate was shocked by 50.8 mm of Composition B-3 initiated by a P-040 lens. h was 38.1 mm.







SHOT 859: **Dynamic Fracture of Nickel**

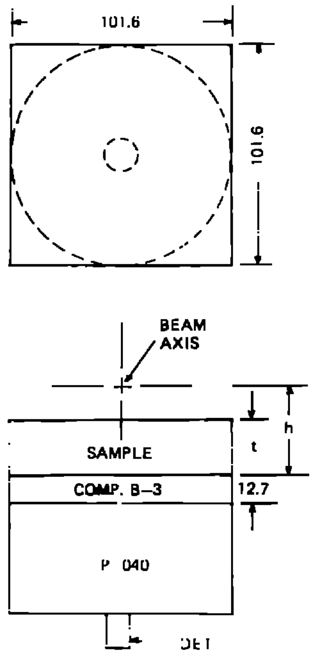
Date: February 15, 1968

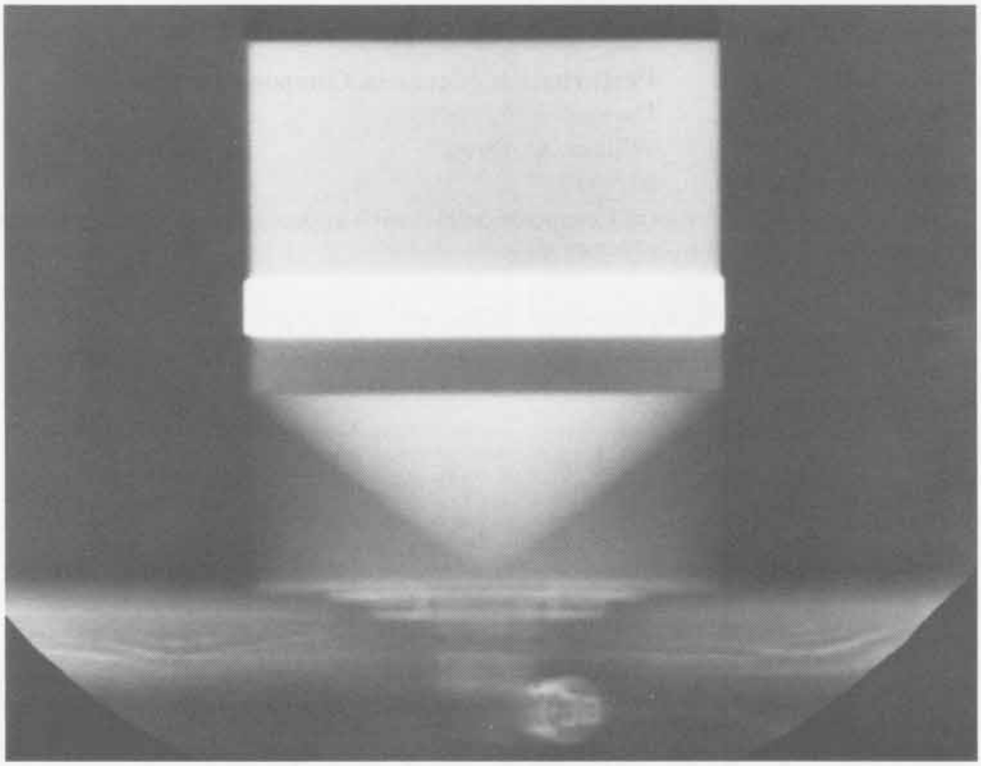
Experimenter: Roger W. Taylor

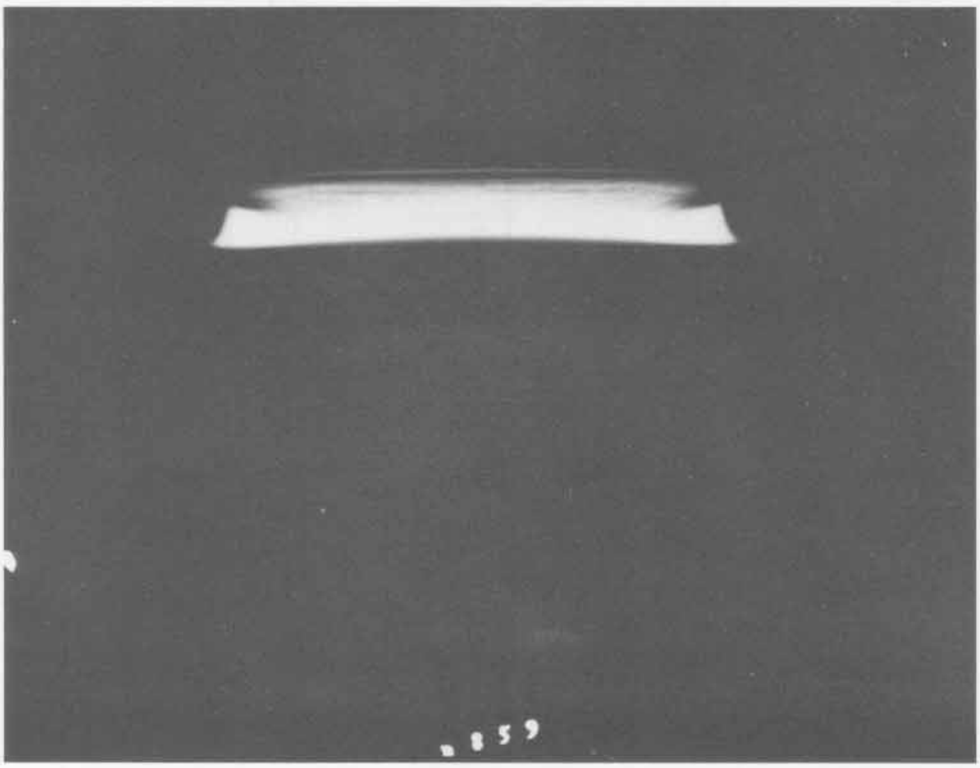
Radiographic Time: 25.05 μs

References: Breed et al., 1967; Thurston and Mudd, 1968

Nickel of 12-mm thickness, t, was dynamically fractured. The plate was shocked by 12.7 mm of Composition B-3 initiated by a P-040 lens. h was 28.6 mm.

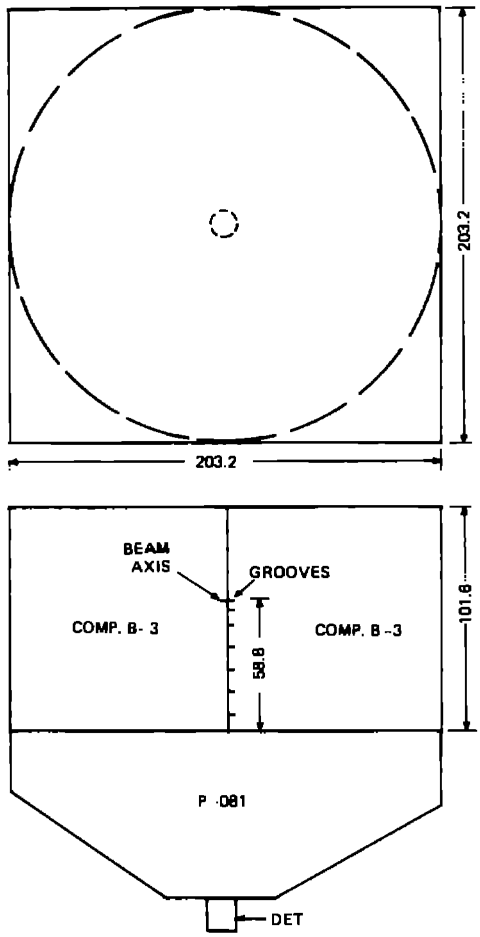


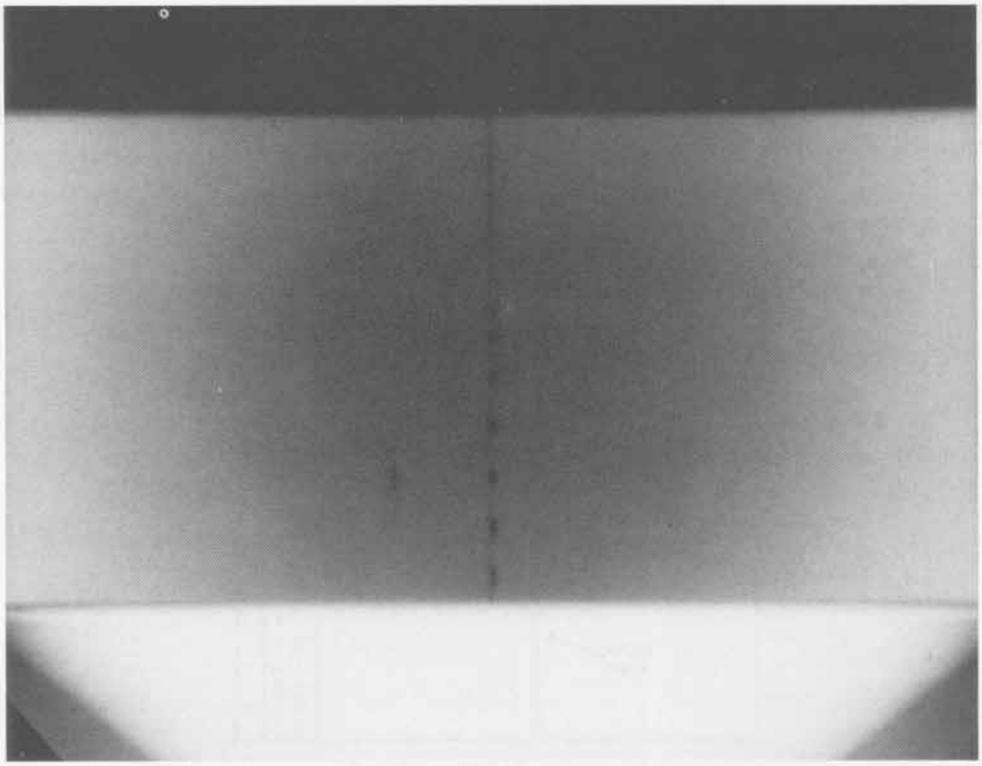


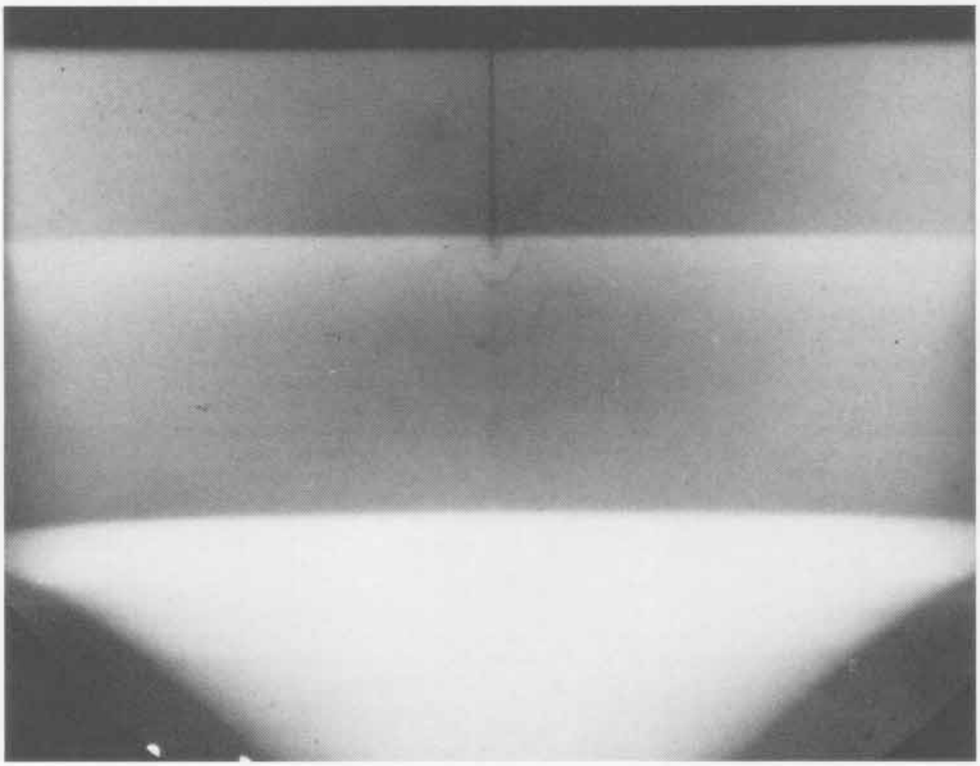


SHOT 861: **Perturbation Waves in Composition B-3**
Date: December 12, 1967
Experimenter: William C. Davis
Radiographic Time: 30.6 μs

Two 101.6-mm-high blocks of Composition B-3 with approximately 1.5-mm square grooves were initiated by a P-081 lens.

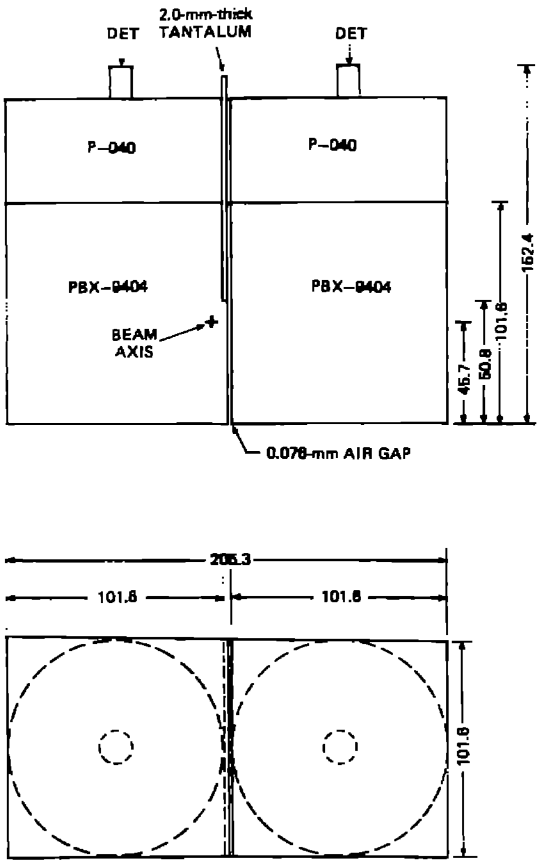


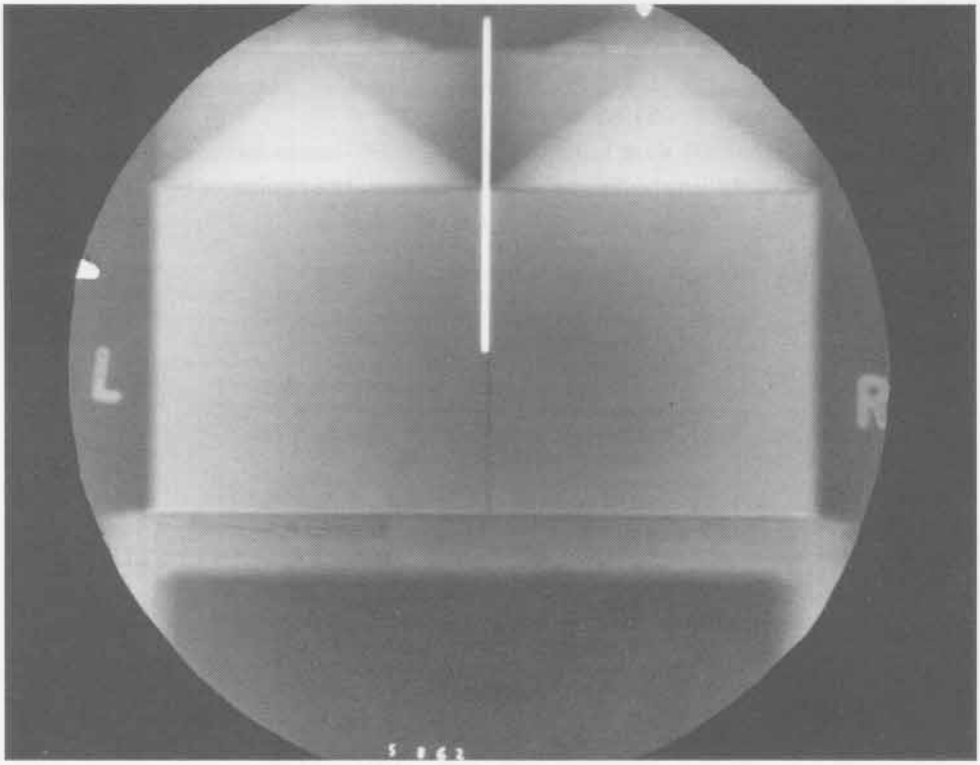




SHOT 862: **PBX-9404 with an Embedded Tantalum Plate**
Date: March 28, 1968
Experimenter: Gary W. Rodenz
Radiographic Time: 20.82 μs

Two blocks of PBX-9404 were initiated by two P-040 lenses detonated 0.4 μs apart. A 2.0-mm-thick tantalum plate was placed between the explosive blocks parallel to the direction of detonation wave travel for 50.8 mm.

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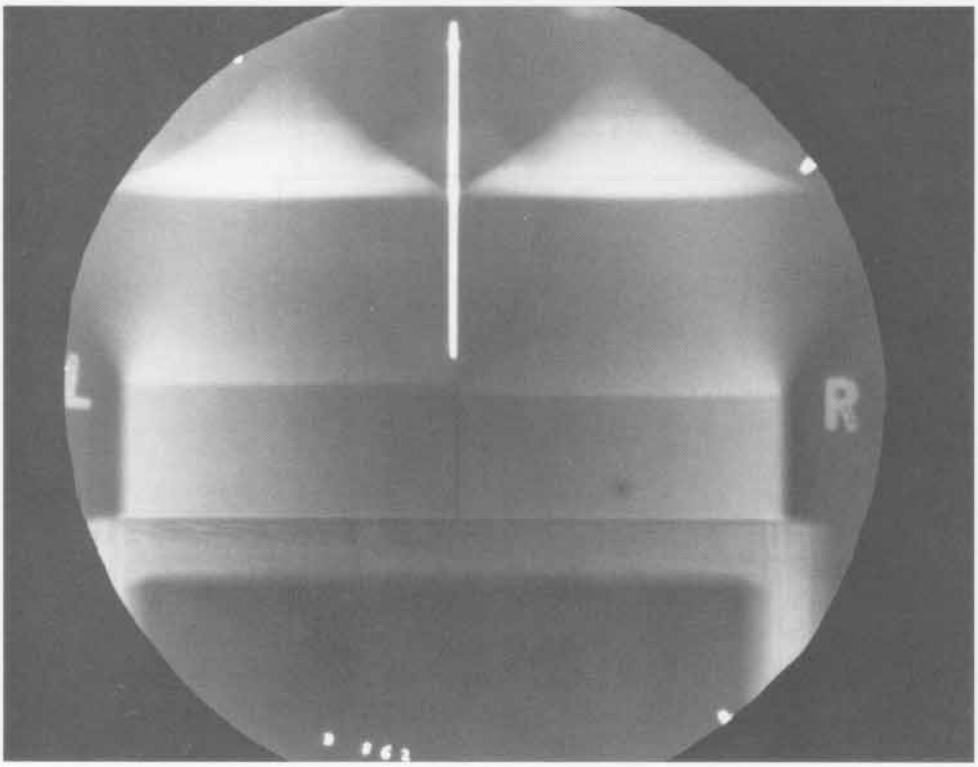
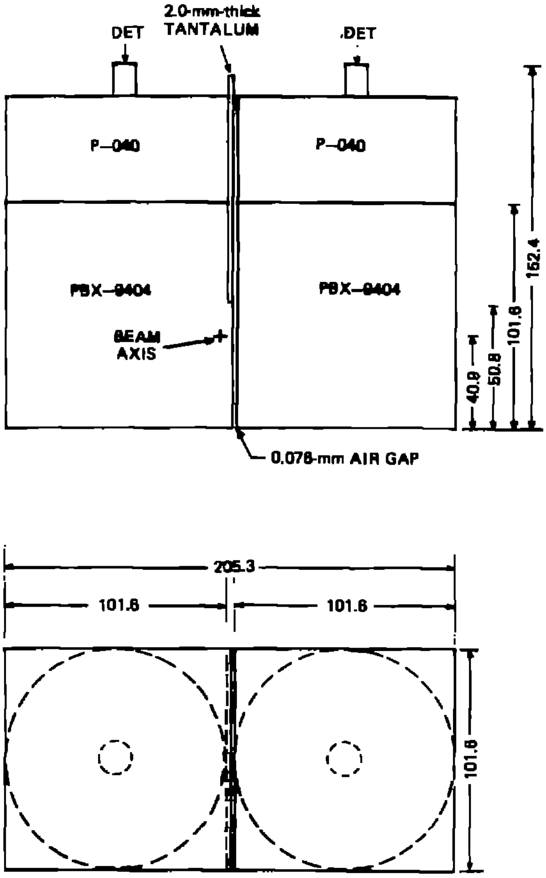
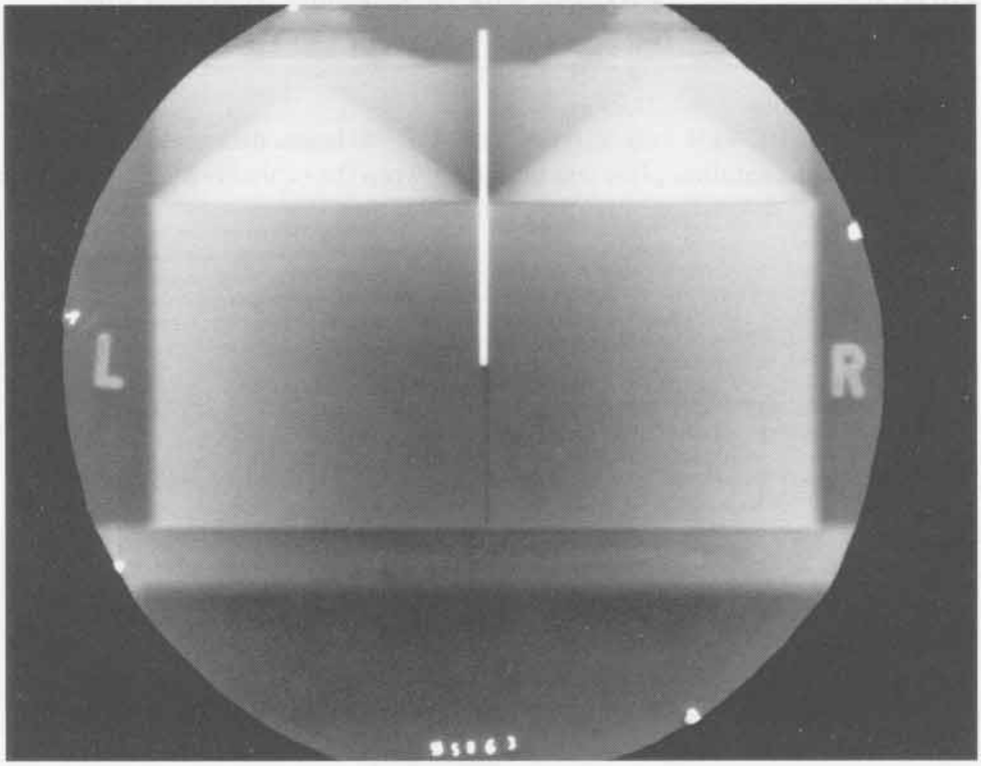

L
R

SHOT 863: **PBX-9404 with an Embedded Tantalum Plate**
Date: April 3, 1968
Experimenter: Gary W. Rodenz
Radiographic Time: 21.65 μs

Two blocks of PBX-9404 were initiated by two P-040 lenses detonated 0.4 μs apart. A 2.0-mm-thick tantalum plate was placed between the explosive blocks parallel to the direction of detonation wave travel for 50.8 mm.

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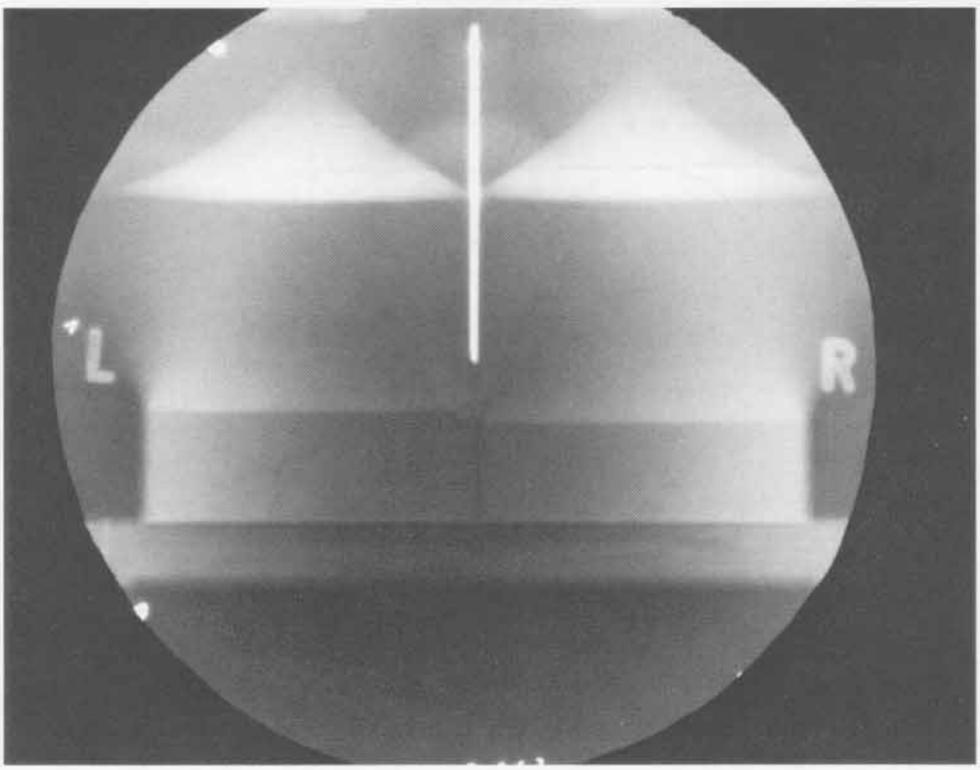

L
R

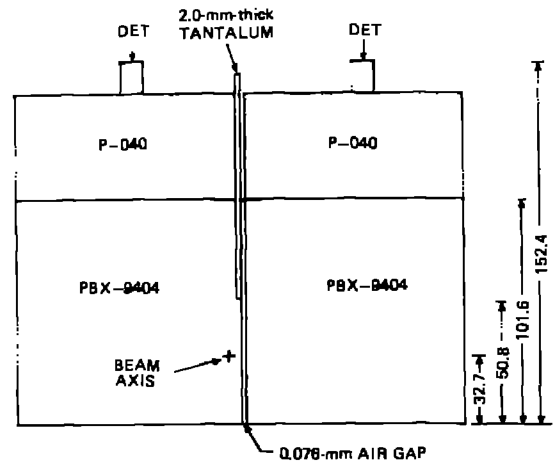
SHOT 864: **PBX-9404 with an Embedded Tantalum Plate**

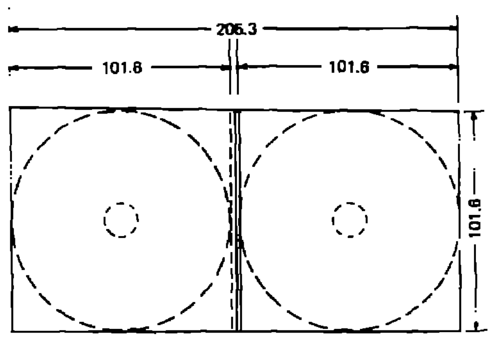
Date: April 9, 1968

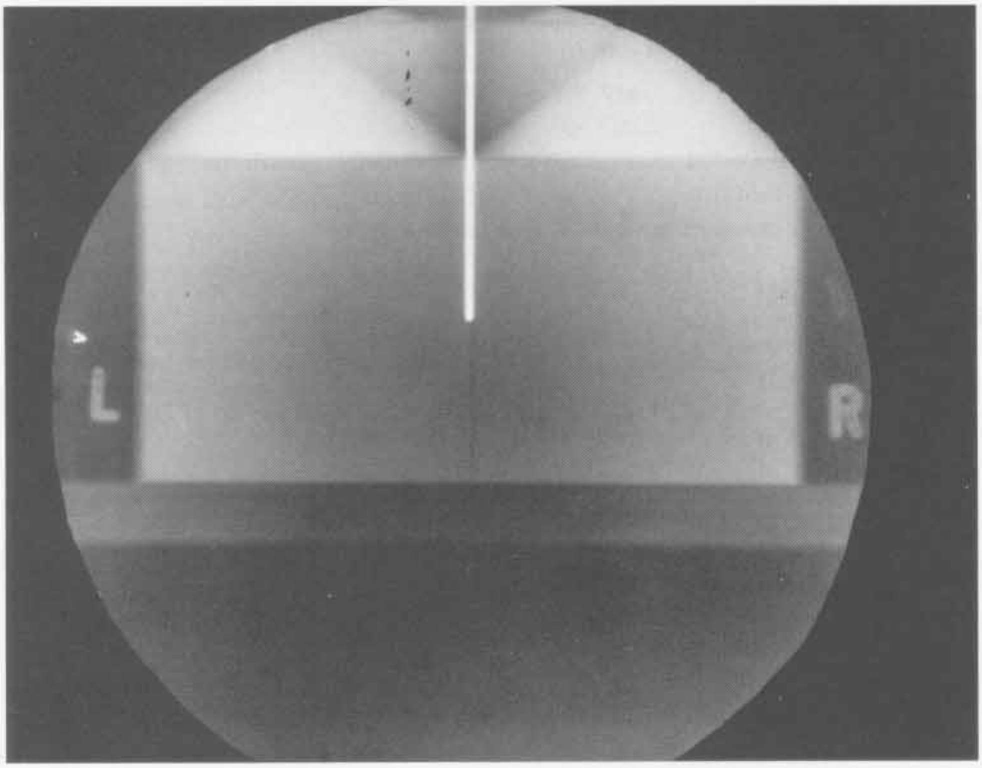
Experimenter: Gary W. Rodenz

Radiographic Time: 22.09 μs

Two blocks of PBX-9404 were initiated by two P-040 lenses detonated 0.4 μs apart. A 2.0-mm-thick tantalum plate was placed between the explosive blocks parallel to the direction of detonation wave travel for 50.8 mm.



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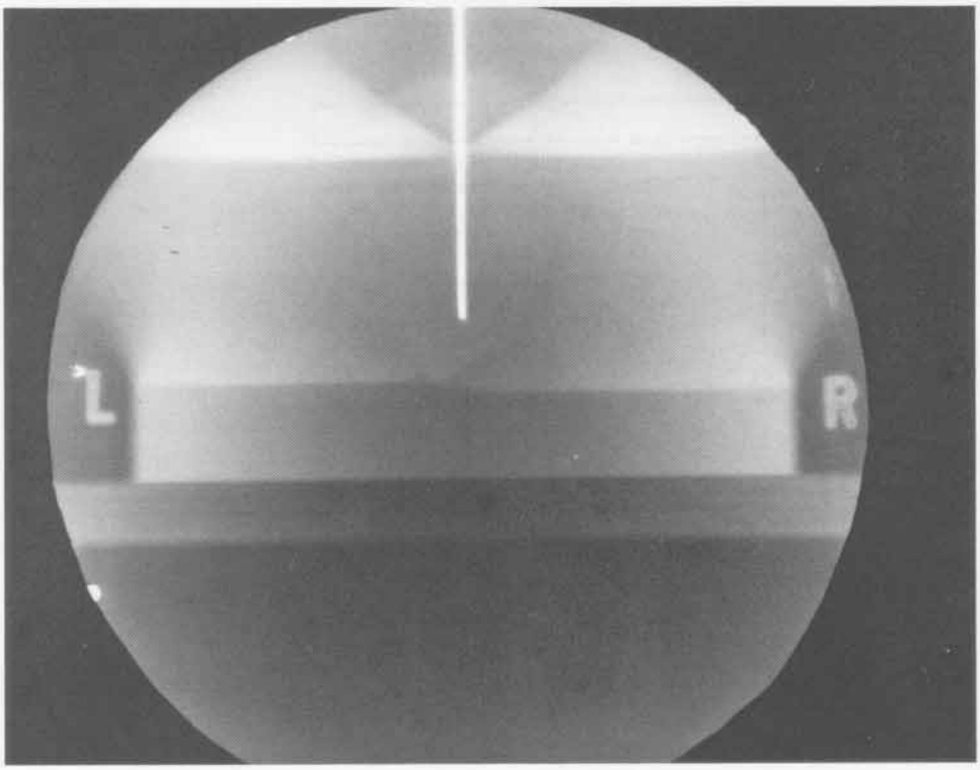
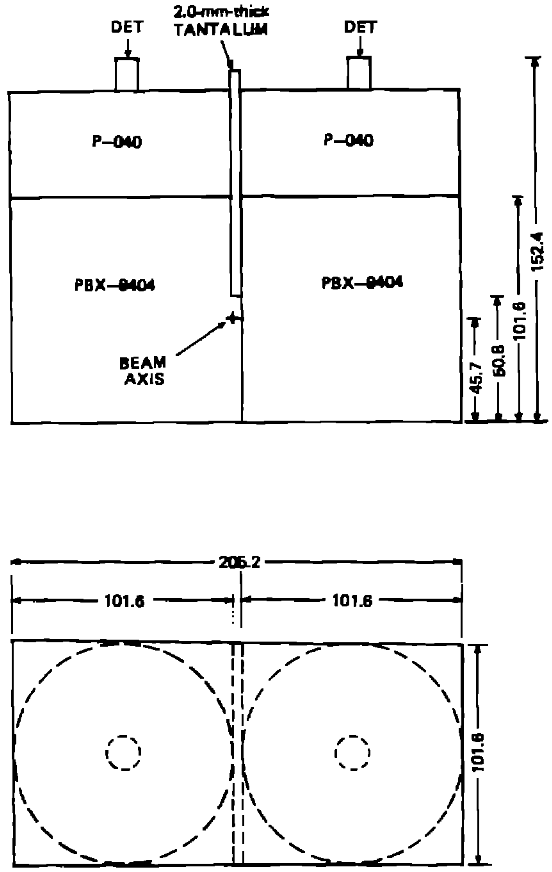
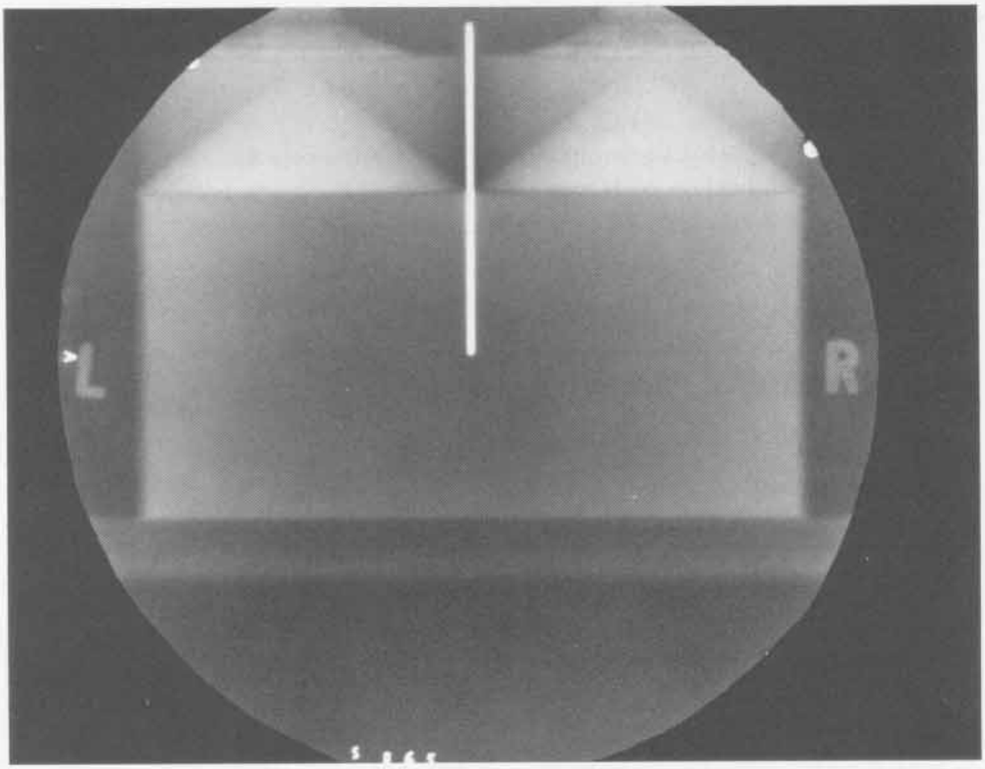

L
R

SHOT 865: **PBX-9404 with an Embedded Tantalum Plate**
Date: April 10, 1968
Experimenter: Gary W. Rodenz
Radiographic Time: 20.65 μs

Two blocks of PBX-9404 were initiated by two P-040 lenses detonated 0.4 μs apart. A 2.0-mm-thick tantalum plate was placed between the explosive blocks parallel to the direction of detonation wave travel for 50.8 mm.

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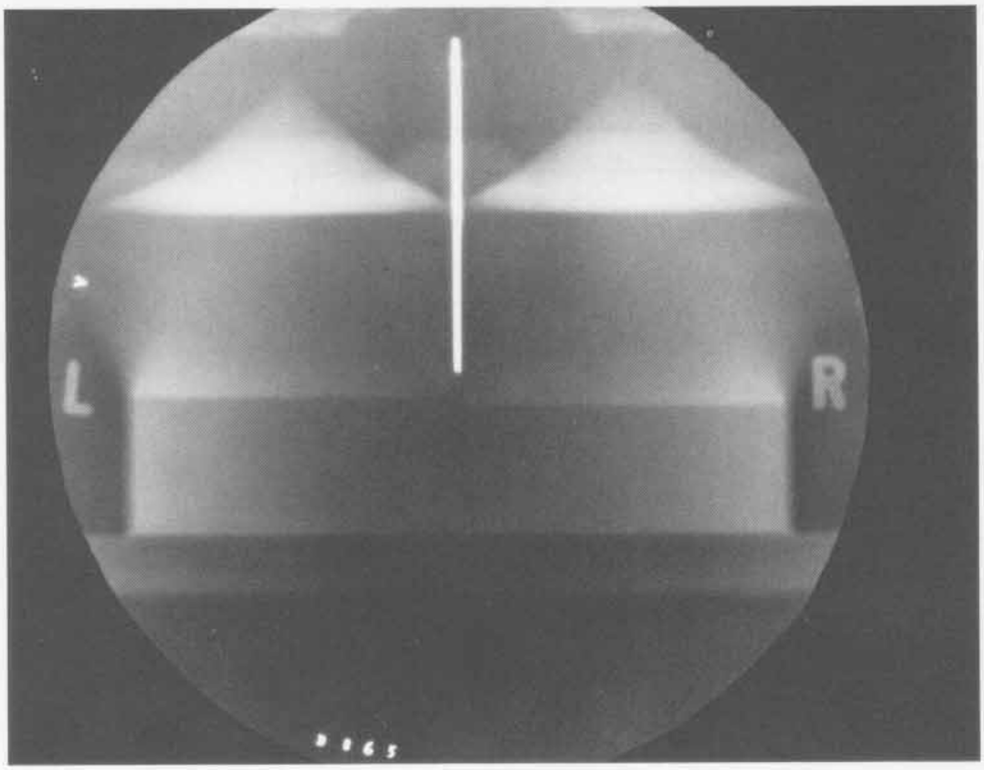
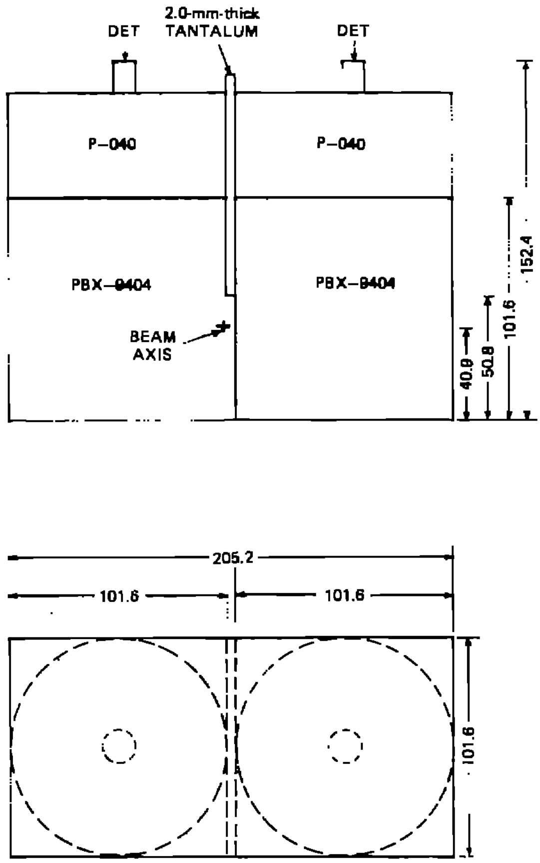
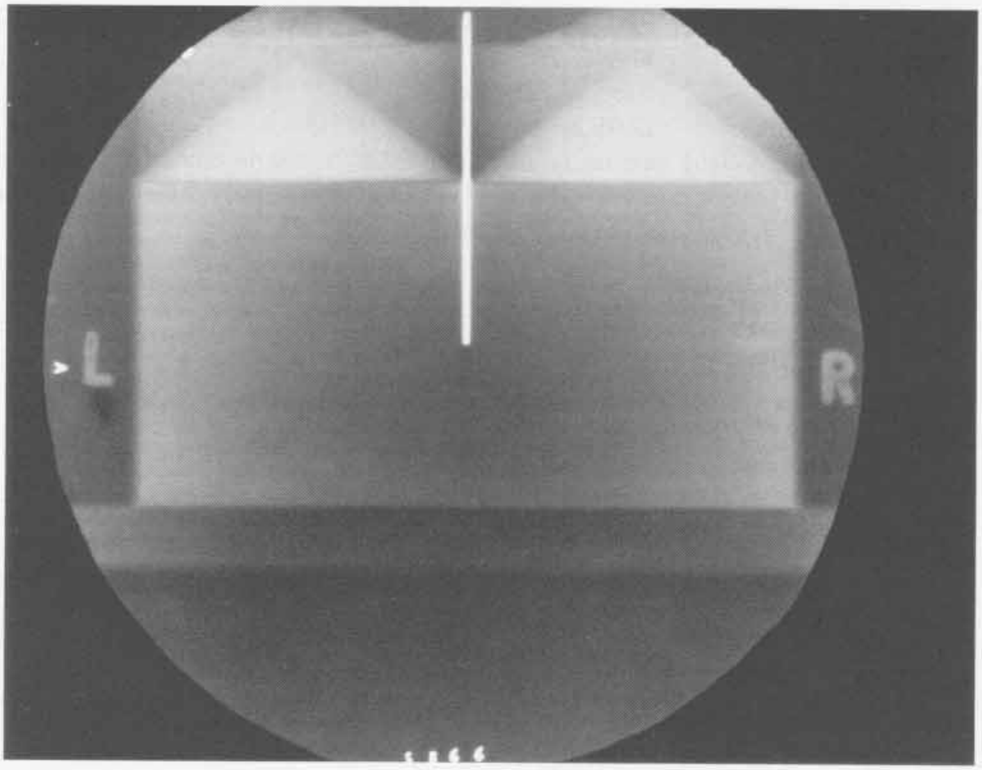

L
R

SHOT 866: **PBX-9404 with an Embedded Tantalum Plate**
Date: April 10, 1968
Experimenter: Gary W. Rodenz
Radiographic Time: 21.61 μs

Two blocks of PBX-9404 were initiated by two P-040 lenses detonated 0.4 μs apart. A 2.0-mm-thick tantalum plate was placed between the explosive blocks parallel to the direction of detonation wave travel for 50.8 mm.

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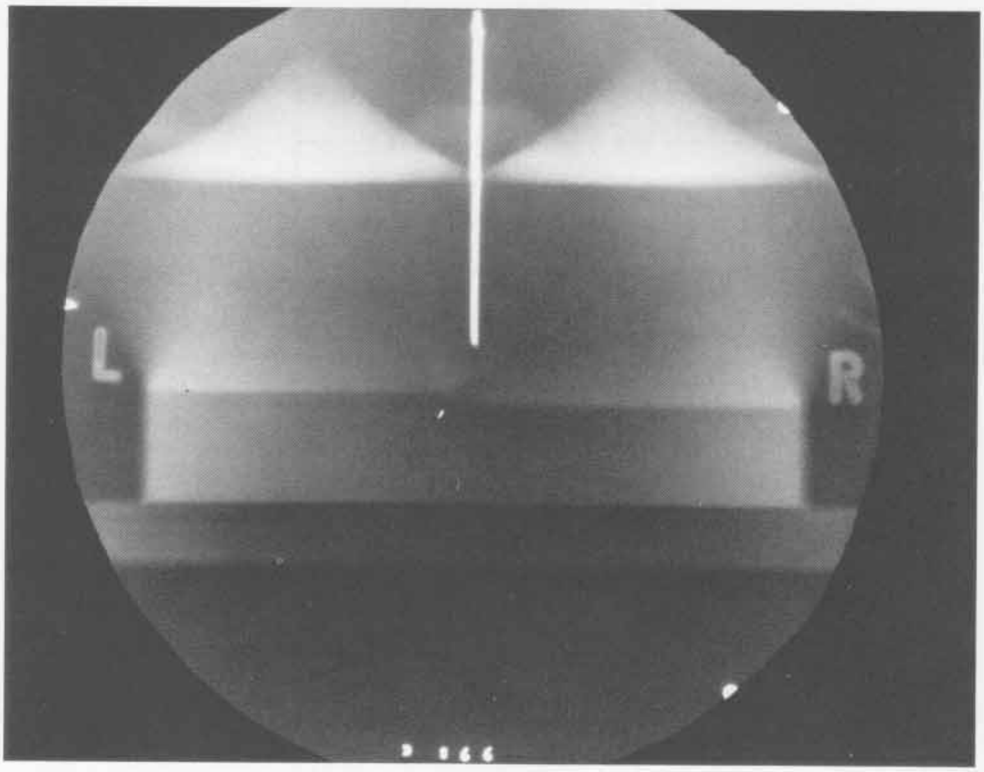
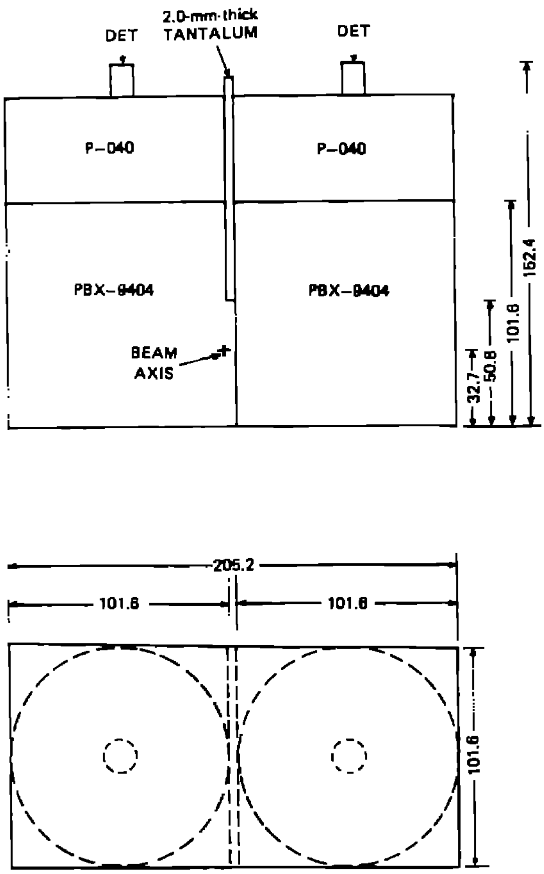
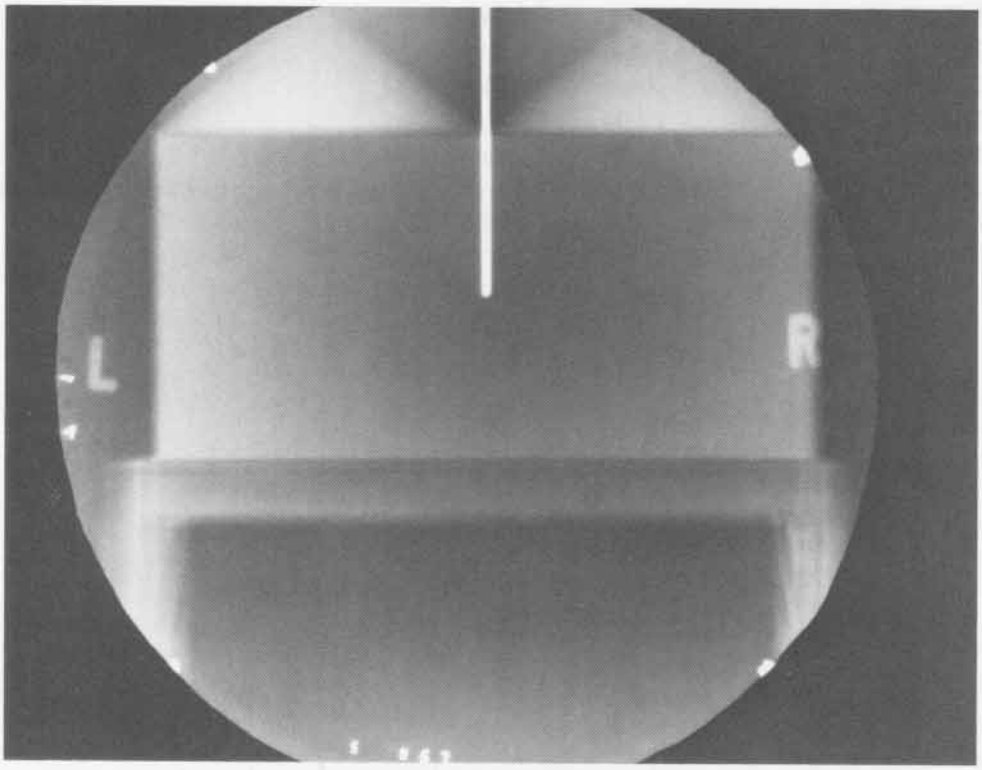

L
R

SHOT 867: **PBX-9404 with an Embedded Tantalum Plate**
Date: May 9, 1968
Experimenter: Gary W. Rodenz
Radiographic Time: 22.05 μs

Two blocks of PBX-9404 were initiated by two P-040 lenses detonated 0.4 μs apart. A 2.0-mm-thick tantalum plate was placed between the explosive blocks parallel to the direction of detonation wave travel for 50.8 mm.

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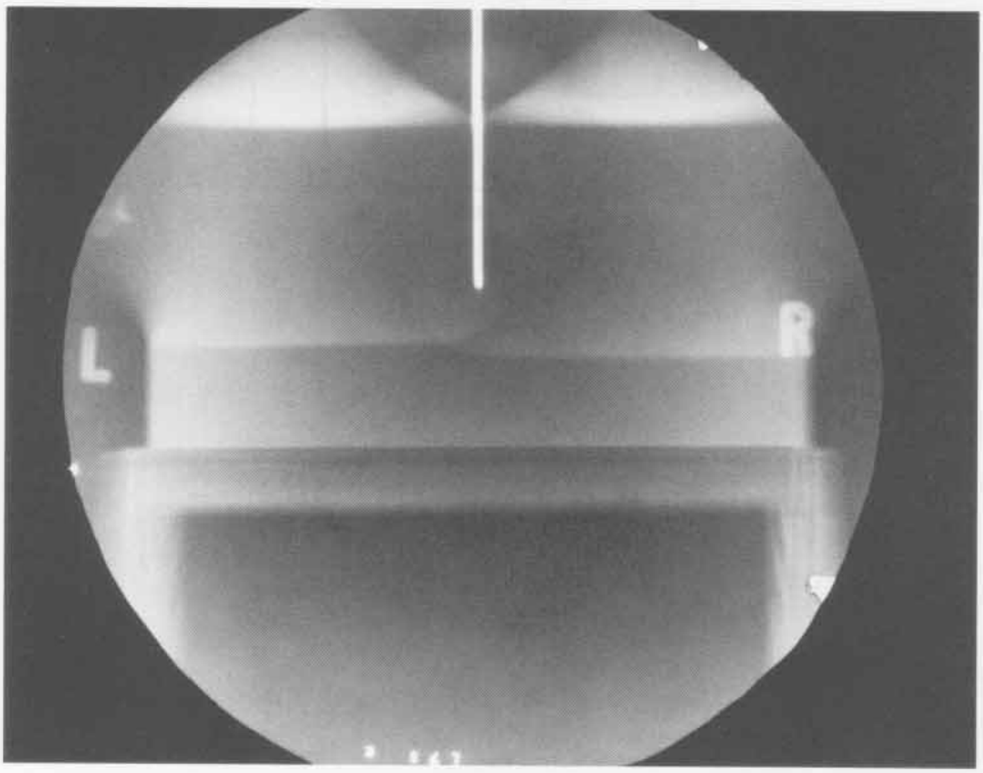
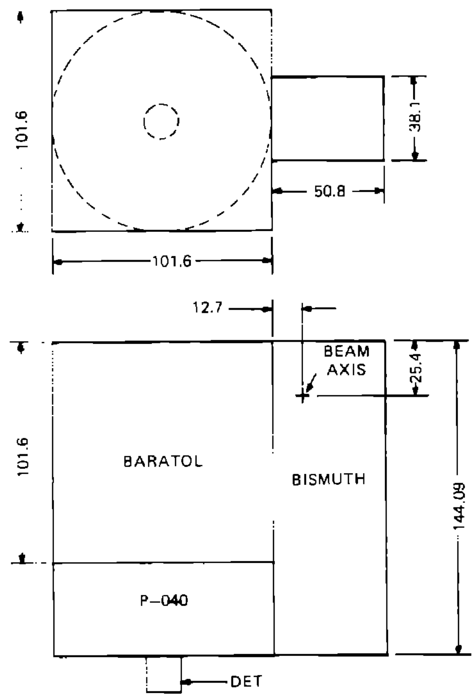
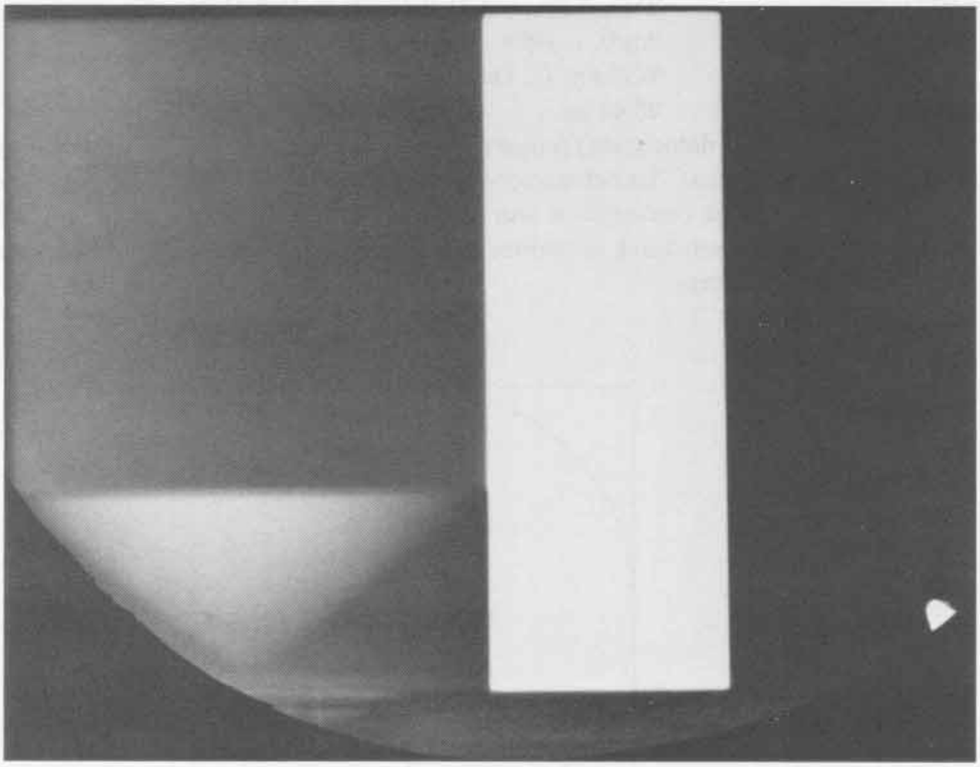
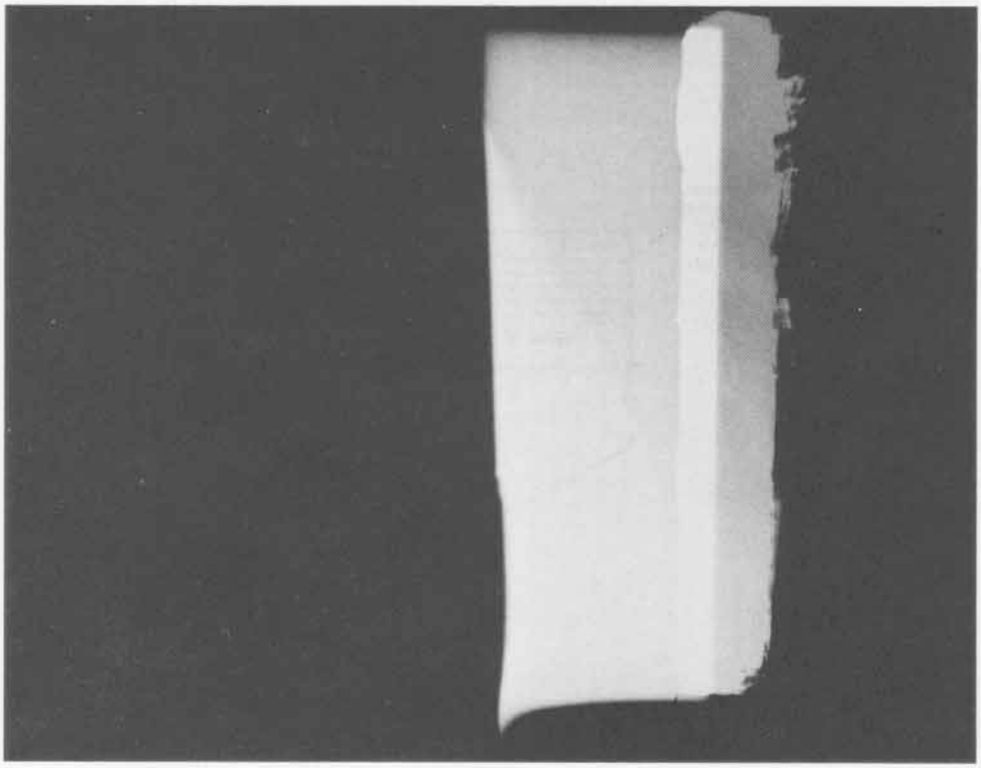

L
R

SHOT 887: **Bismuth Phase Change**
Date: February 15, 1968
Experimenter: Roger W. Taylor
Radiographic Time: 32.04 μs
Reference: Breed and Venable, 1968

A 50.8- by 38.1-mm block of bismuth was shocked by 101.6 mm of Baratol initiated by a P-040 lens. See Shots 769, 946, and 987.

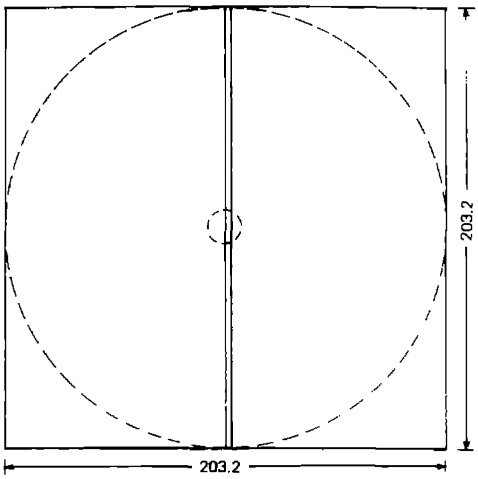


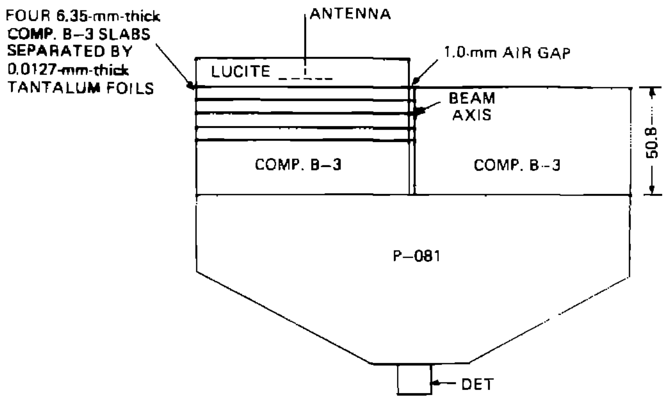


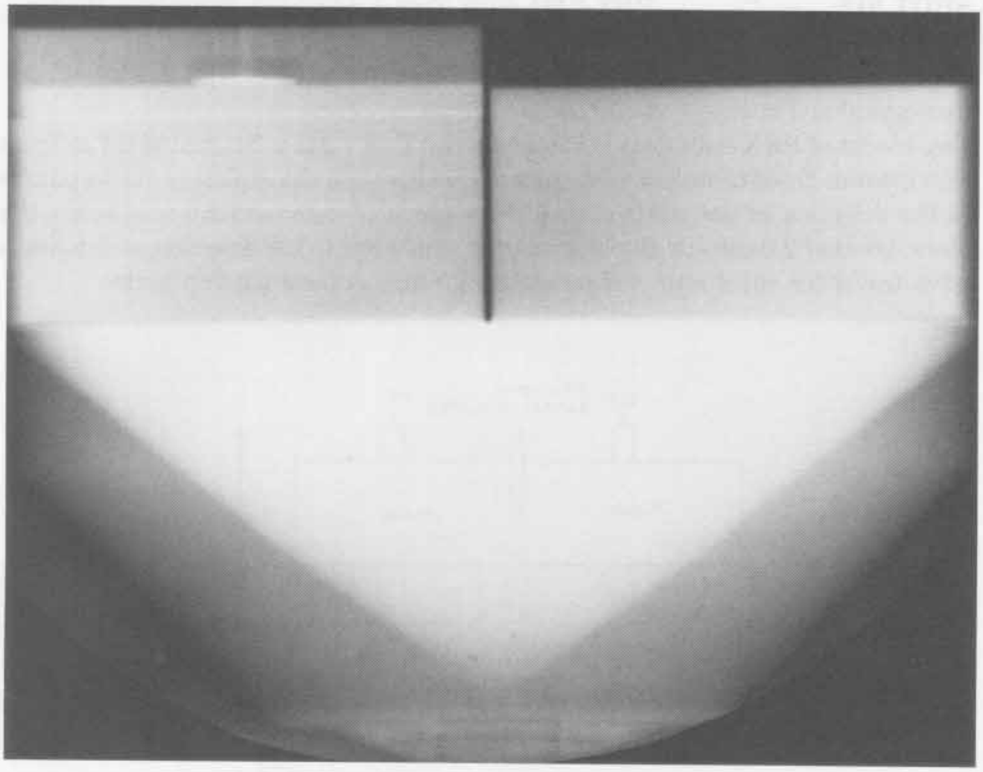


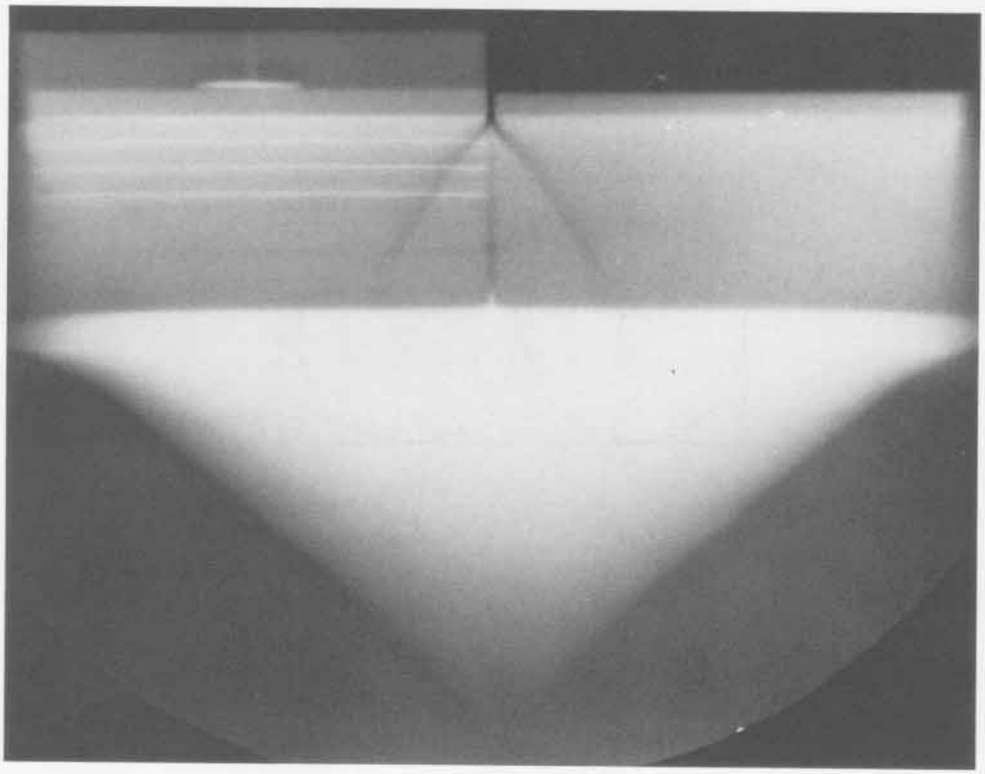
SHOT 899: **Two Adjacent Composition B-3 Detonations**
Date: April 4, 1968
Experimenter: William C. Davis
Radiographic Time: 28.43 μs

Two Composition B-3 detonations separated by a 1.0-mm air gap. The charges were initiated by a P-081 lens. The detonations have run along the gap for 44.5 mm. One Composition B-3 block consisted of four slabs of 6.35-mm-thick Composition B-3 separated by 0.0127-mm-thick tantalum foils and a 25.4-mm-thick slab. The foils extended across the gap.





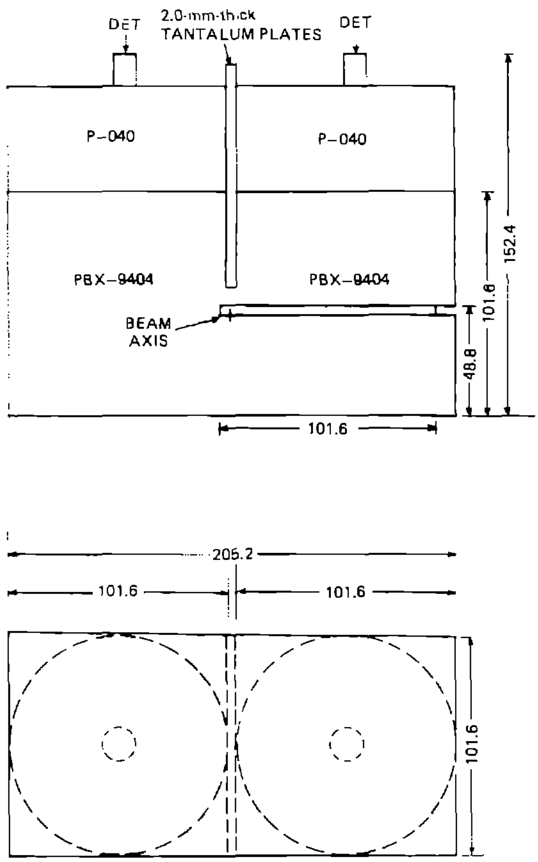


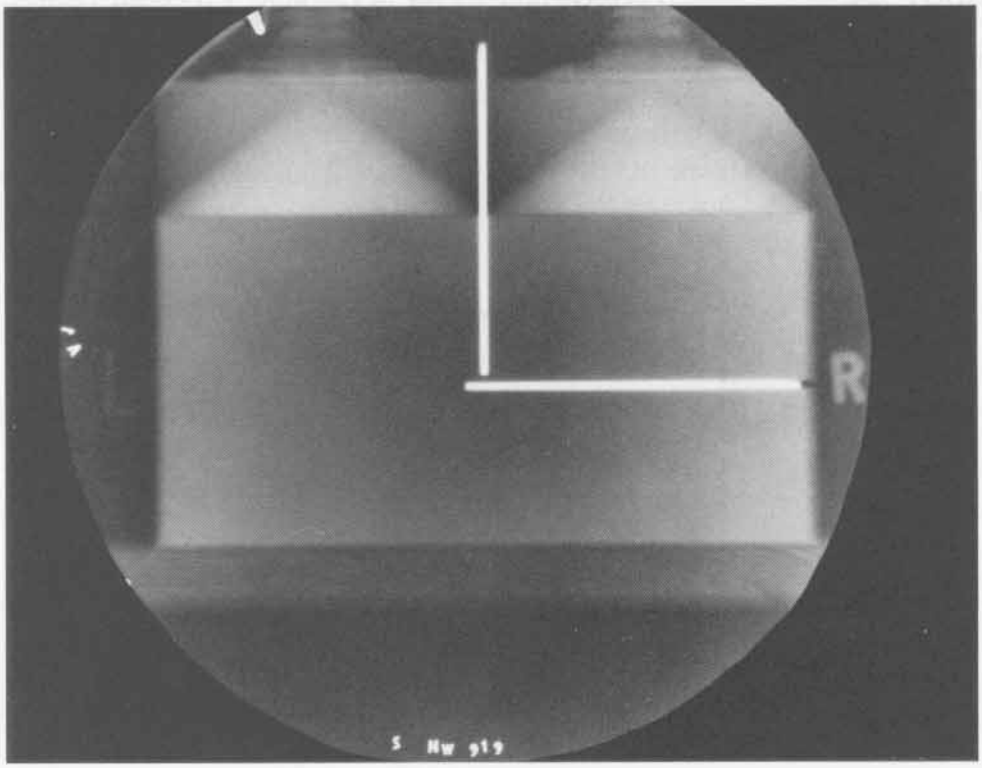


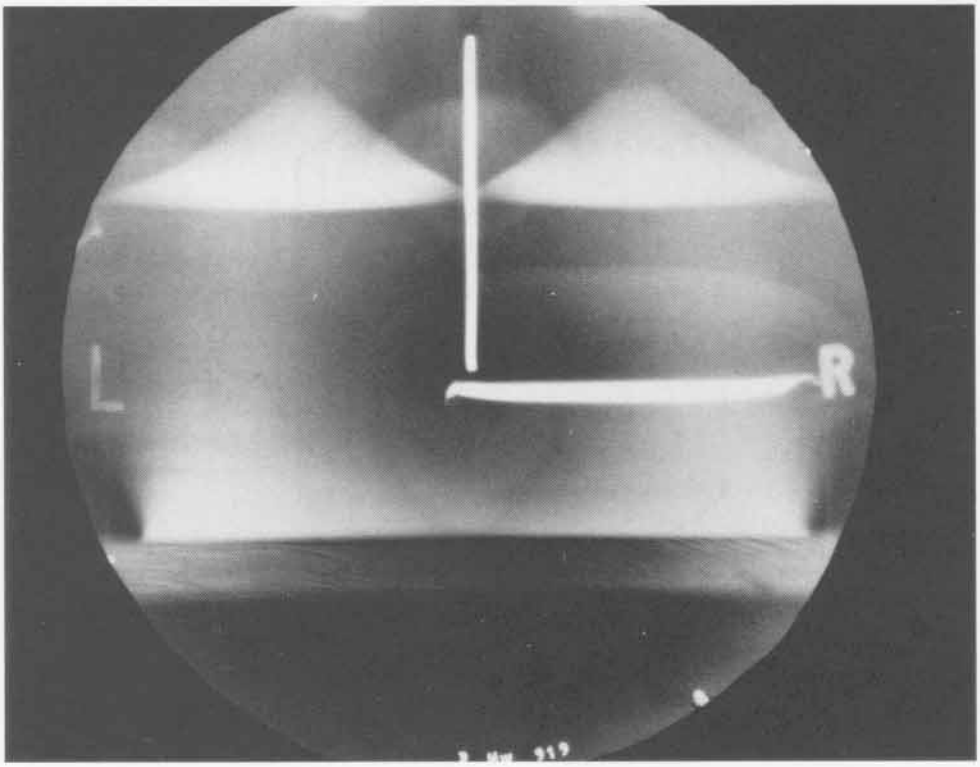
SHOT 919: PBX-9404 with Two Embedded Tantalum Plates

Date: June 17, 1969
Experimenter: Gary W. Rodenz
Radiographic Time: 25.73 μs

Two blocks of PBX-9404 were initiated by two P-040 lenses detonated 0.4 μs apart. One 2.0-mm-thick tantalum plate was placed between the explosive blocks parallel to the direction of detonation wave travel for 48.8 mm and 2.0 mm below that plate, another 2.0-mm-thick plate was perpendicular to the direction of detonation wave travel for 101.6 mm and projected 4.0 mm beyond the top plate.




R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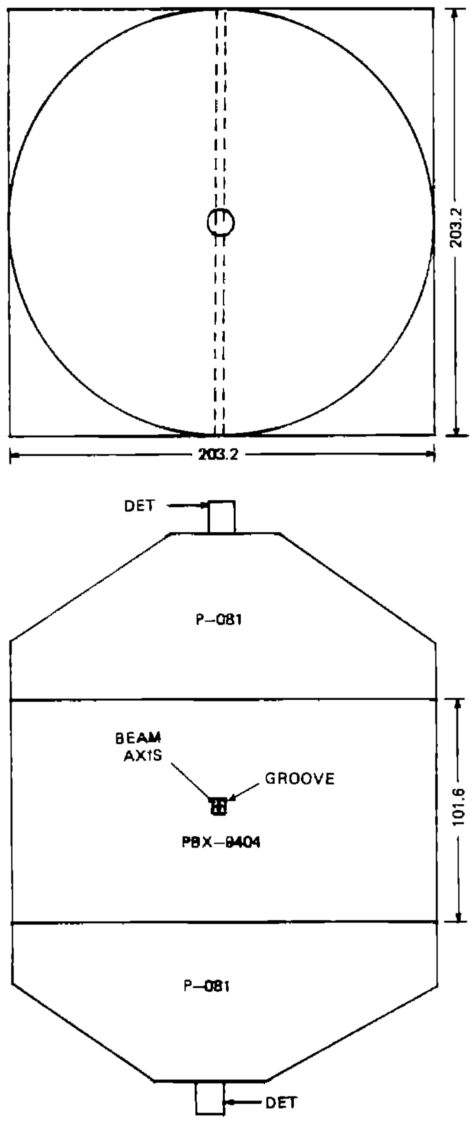
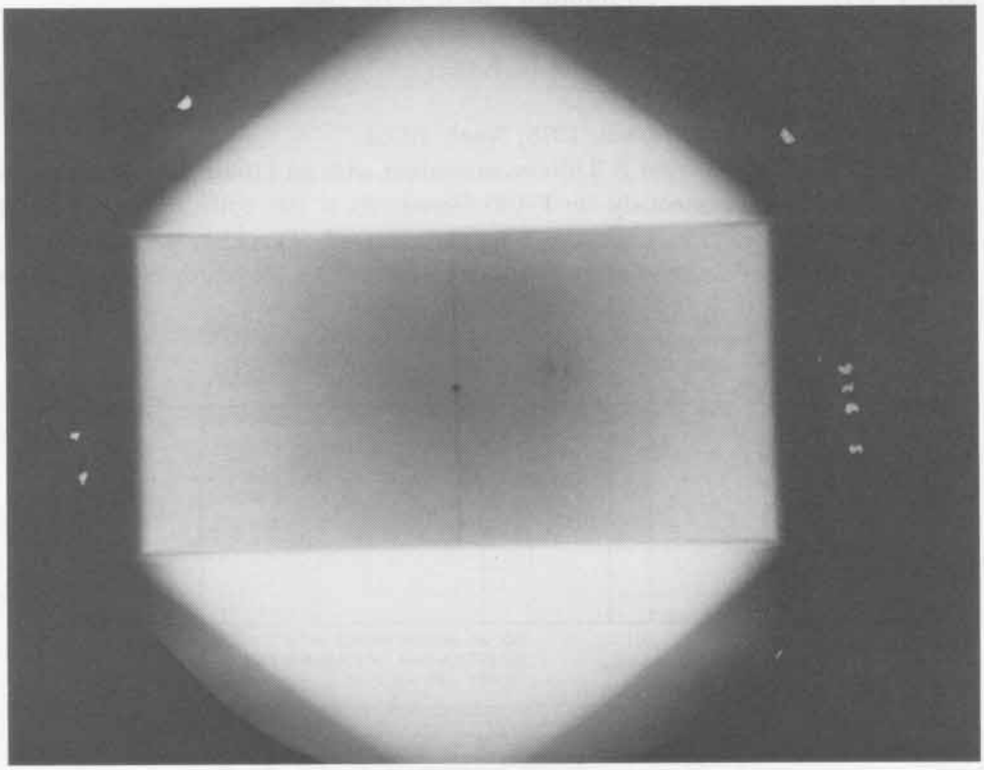
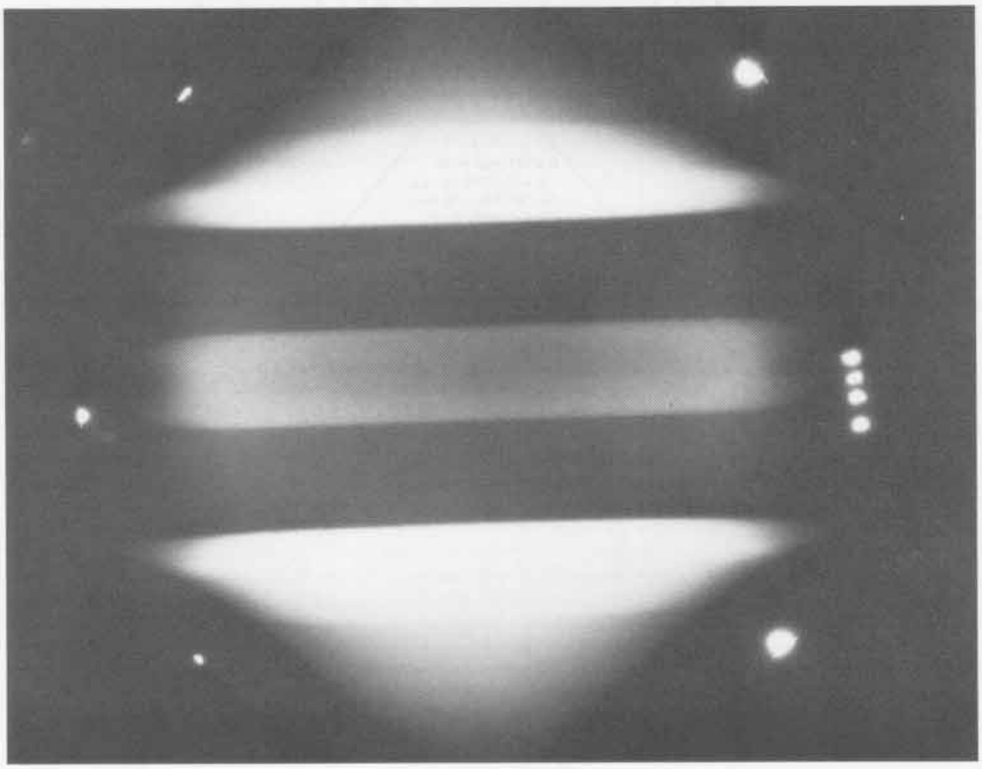
SHOT 926:	**Perturbation Waves in Colliding PBX-9404 Detonations**
Date:	June 13, 1968
Experimenter:	Roger W. Taylor
Radiographic Time:	30.59 μs

Two 101.6-mm-high blocks of PBX-9404 were initiated simultaneously at both ends by P-081 lenses. A 1.5-mm-square groove was located at the center of the charge.

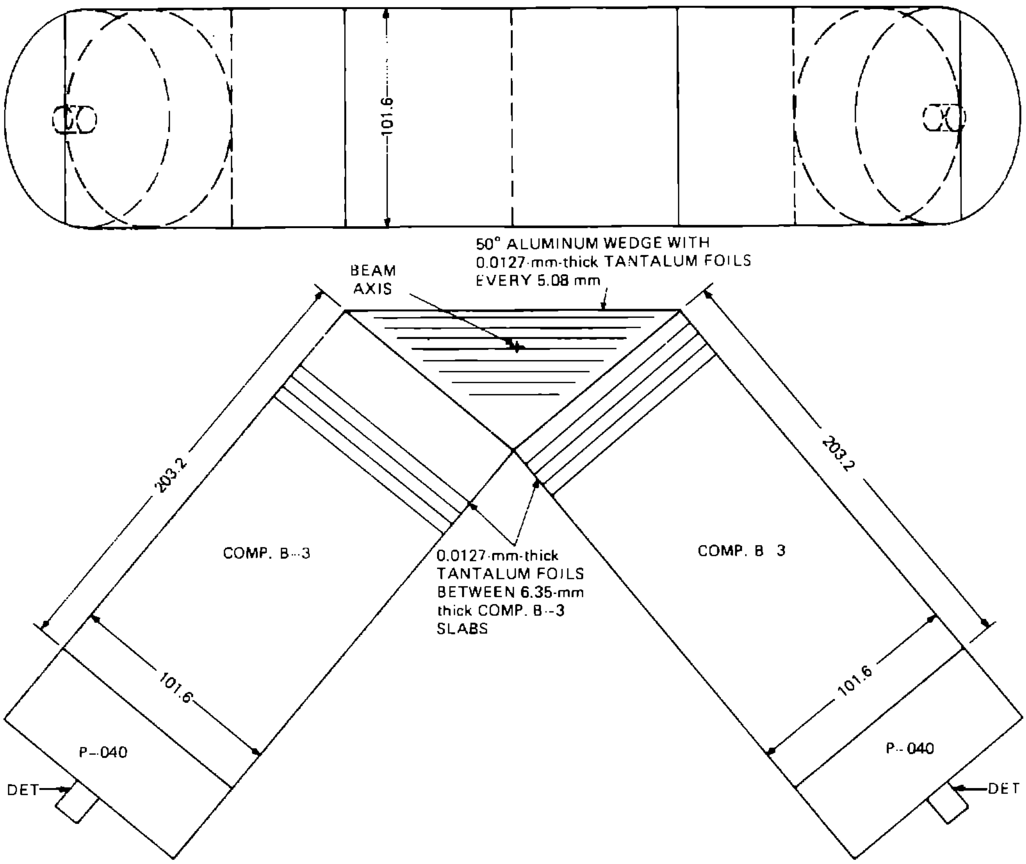


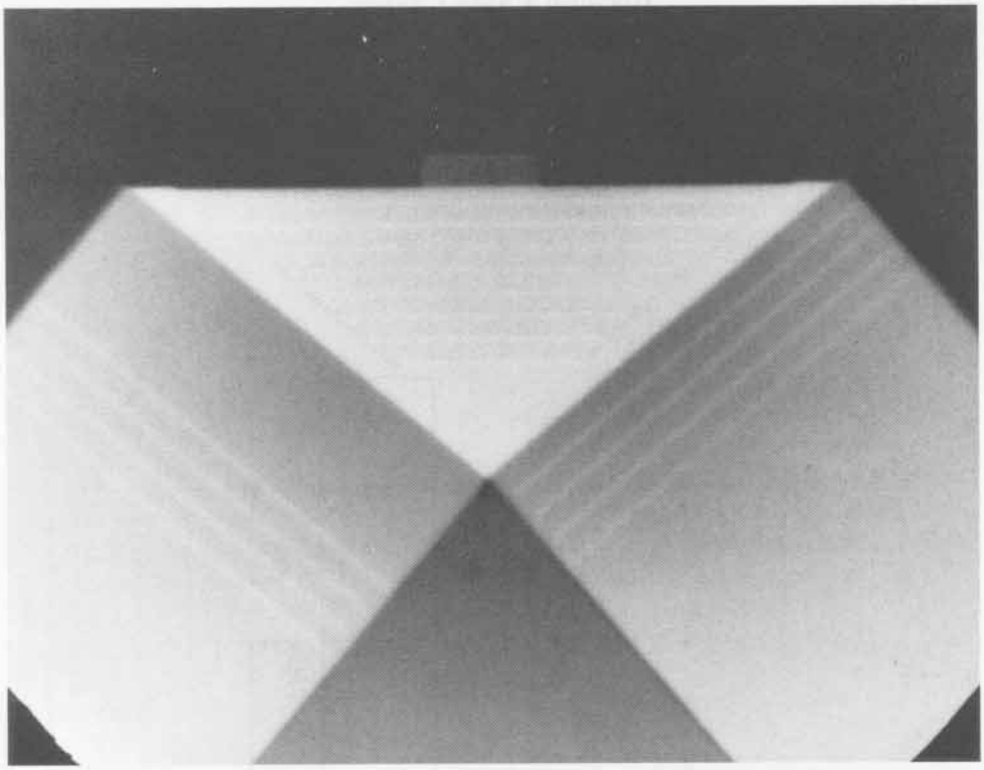


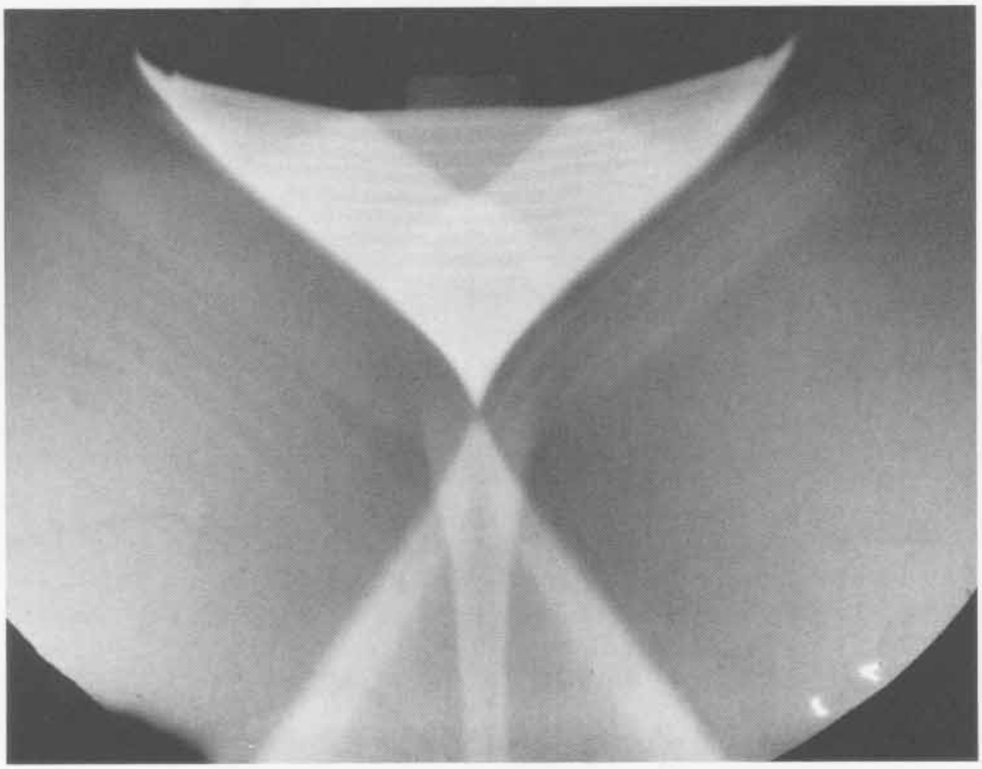


SHOT 927:	**Aluminum Mach Reflection**
Date:	May 27, 1968
Experimenter:	Timothy R. Neal
Radiographic Time:	43.75 μs
References:	Neal, 1975; Neal, 1976a

Two 101.6-mm Composition B-3 blocks in contact with an 1100-F aluminum wedge were initiated simultaneously by P-040 lenses. At a 50° collision angle, Mach reflection of the two aluminum shock waves occurred. This shot was identical to Shot 615 with the addition of embedded 0.0127-mm-thick tantalum foils to monitor the flow.

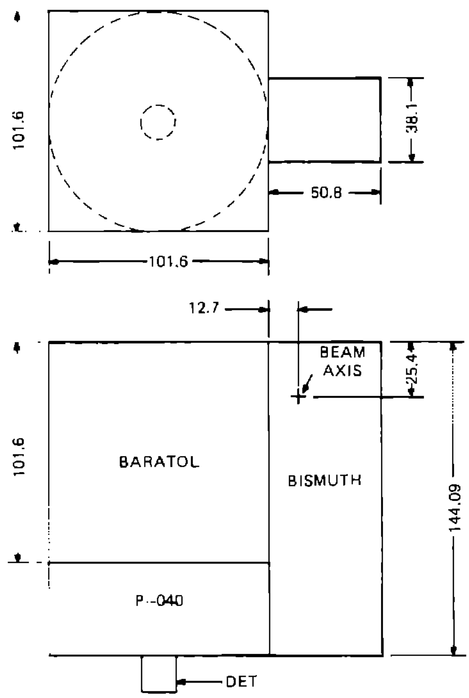


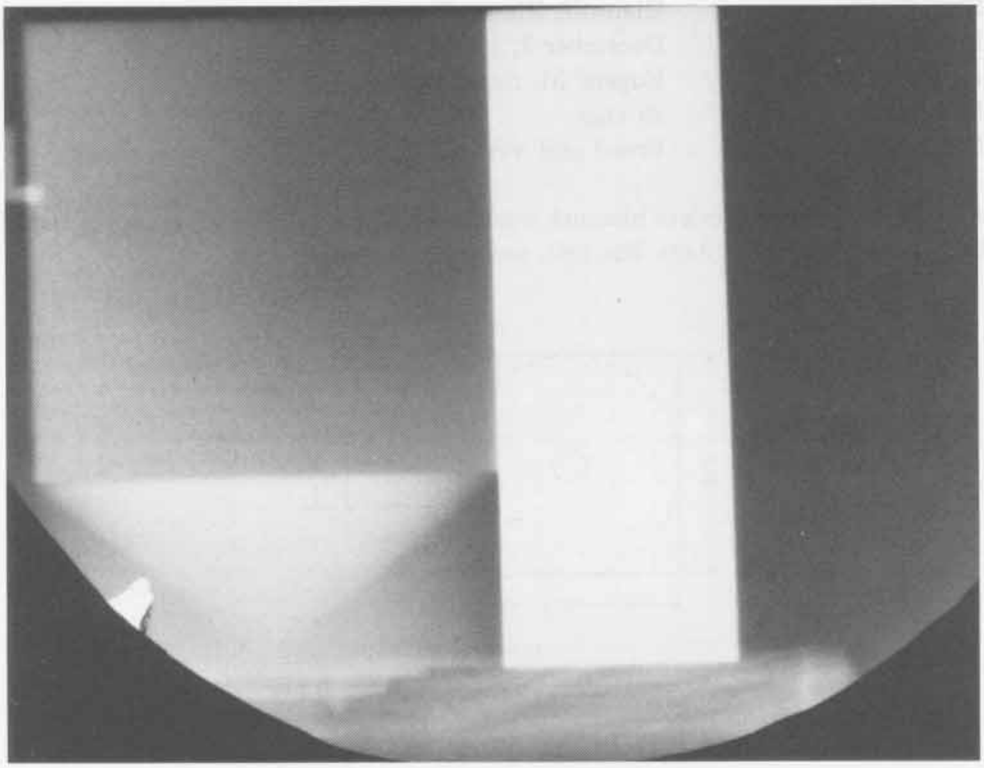


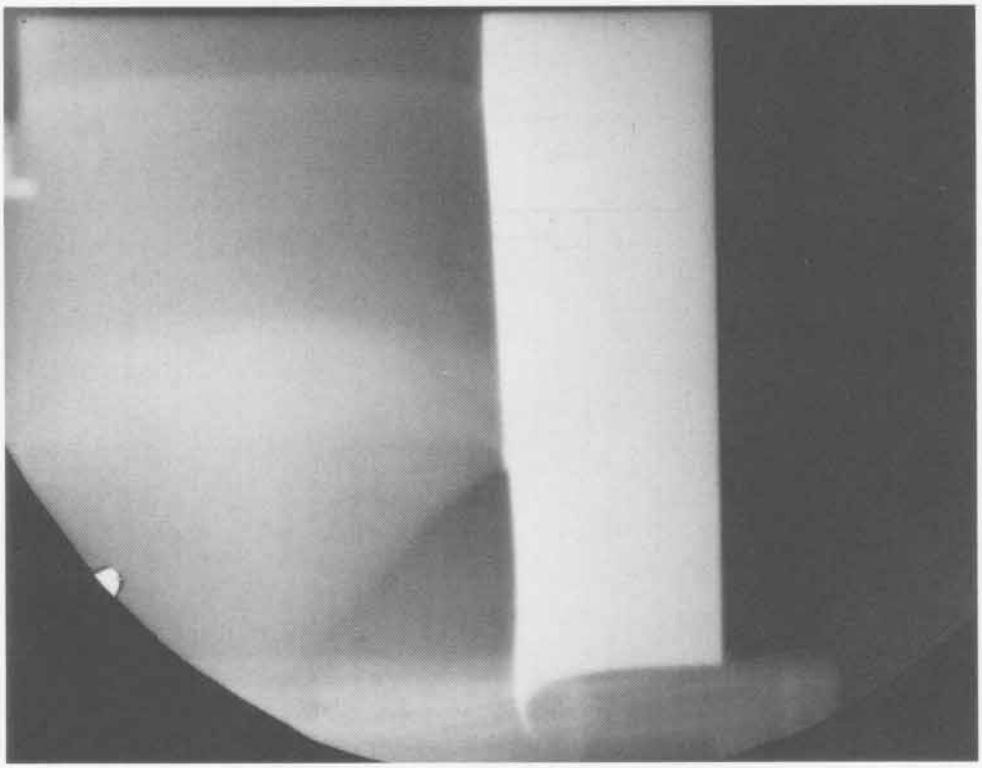


SHOT 946: **Bismuth Phase Change**
Date: October 22, 1968
Experimenter: Eugene M. Sandoval
Radiographic Time: 32.01 μs
Reference: Breed and Venable, 1968

A 50.8- by 38.1-mm block of bismuth was shocked by 101.6 mm of Baratol initiated by a P-040 lens. See Shots 769, 887, and 987.







SHOT 987: **Bismuth Phase Change**

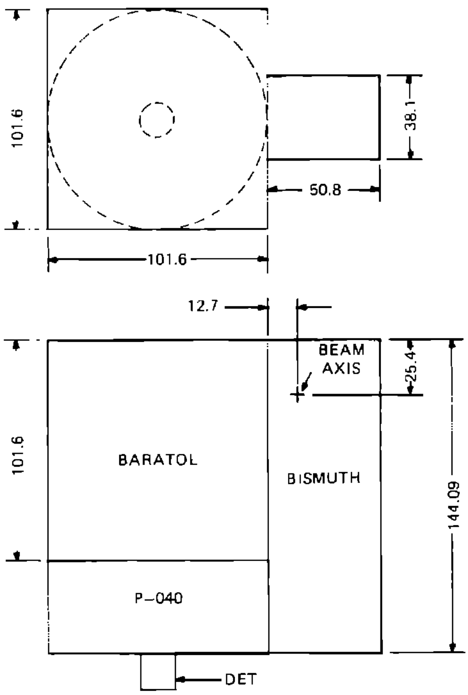
Date: December 3, 1968

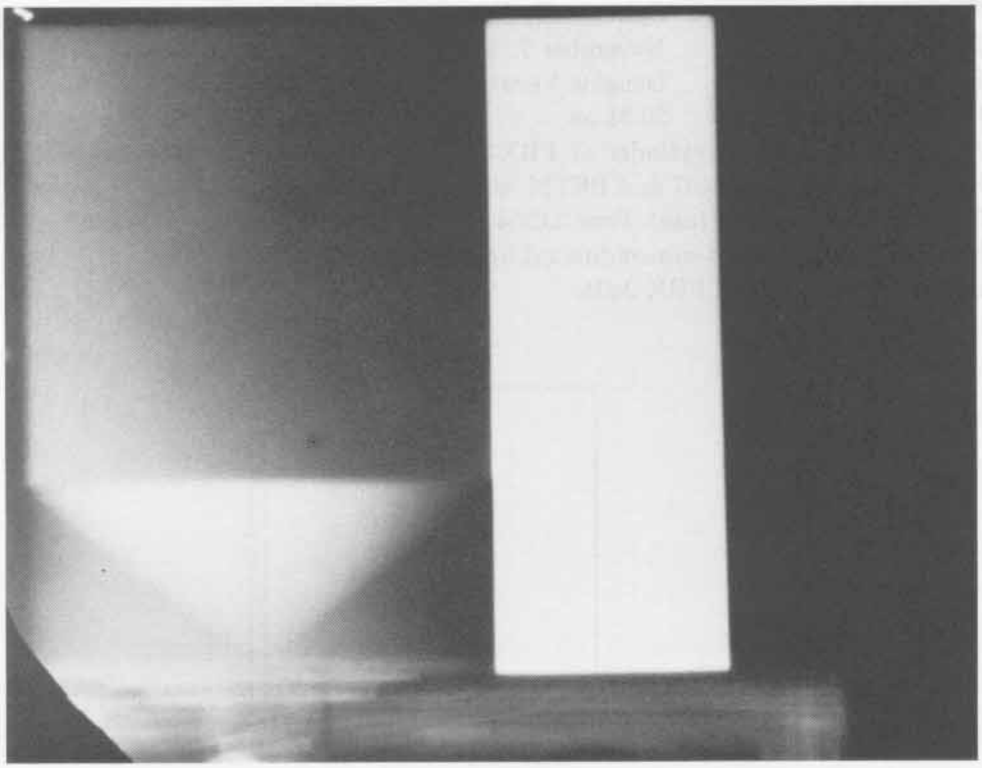
Experimenter: Eugene M. Sandoval

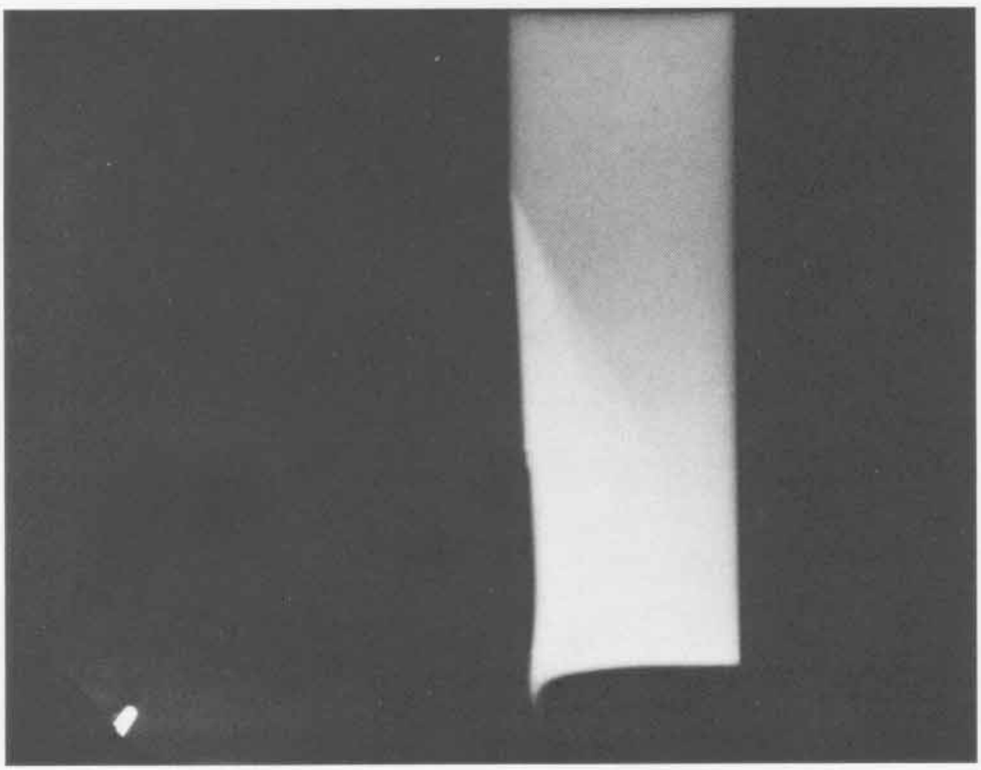
Radiographic Time: 28.14μs

Reference: Breed and Venable, 1968

A 50.8- by 38.1-mm block of bismuth was shocked by 101.6 mm of Baratol initiated by a P-040 lens. See Shots 769, 887, and 946.

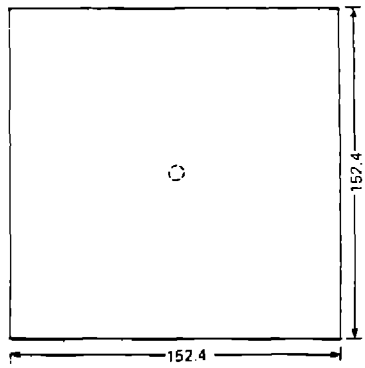


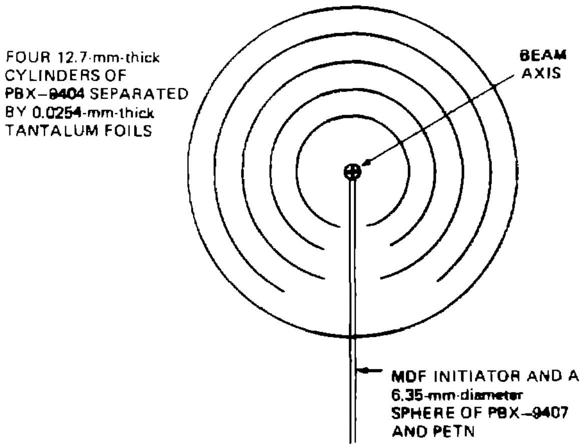


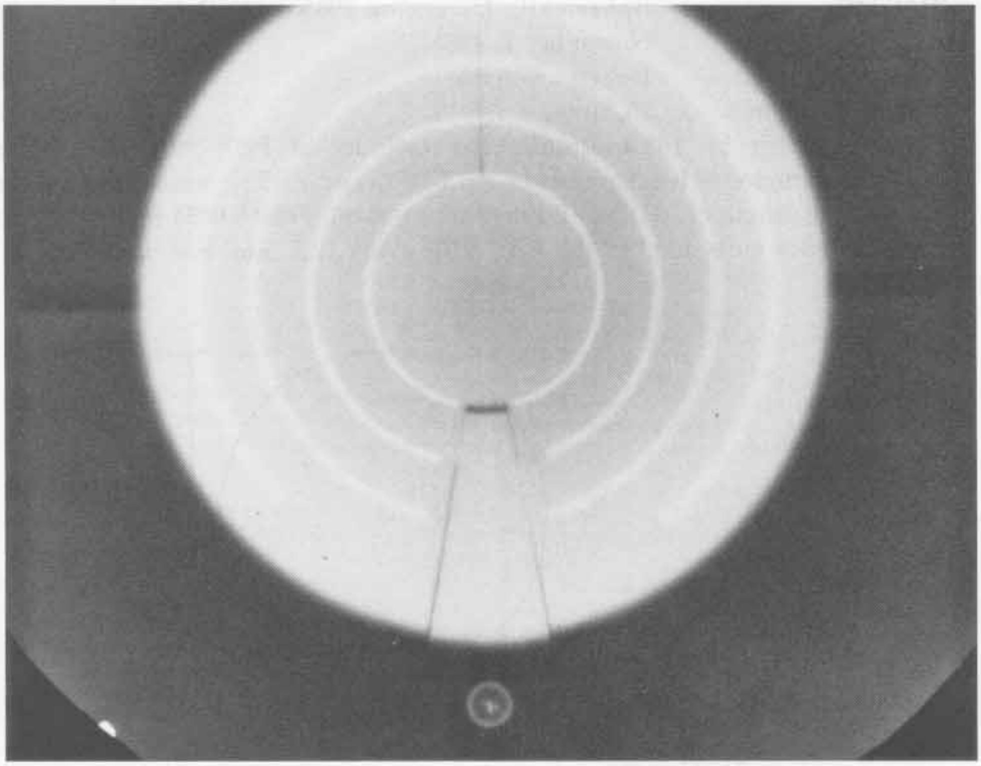


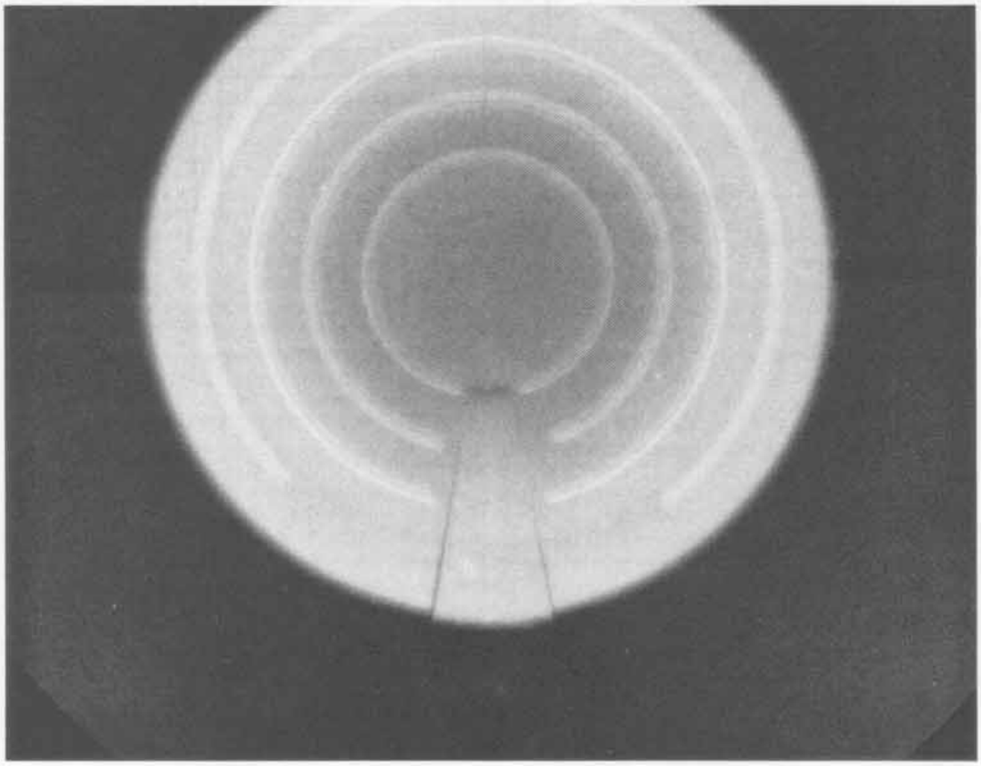
SHOT 988: **Spherically Diverging PBX-9404 Detonation**
Date: November 7, 1968
Experimenter: Douglas Venable
Radiographic Time: 26.31 μs

A 152.4-mm-diameter cylinder of PBX-9404 was center-initiated by composite hemispheres of PBX-9407 and PETN, which were center-initiated by a length of MDF (mild detonating fuse). Four 0.0254-mm-thick tantalum foils were embedded between the center 25.4-mm-radius cylinder of PBX-9404 and four concentric 12.7-mm-thick cylinders of PBX-9404.



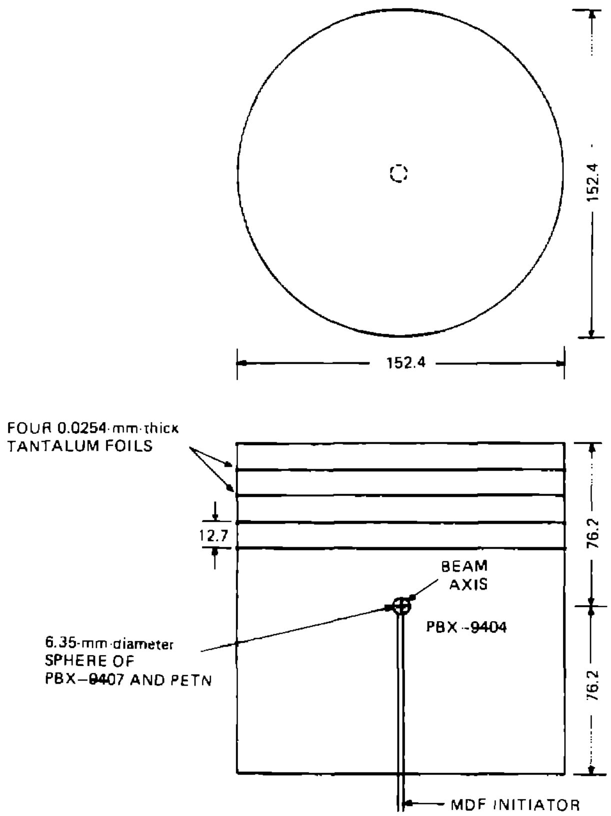


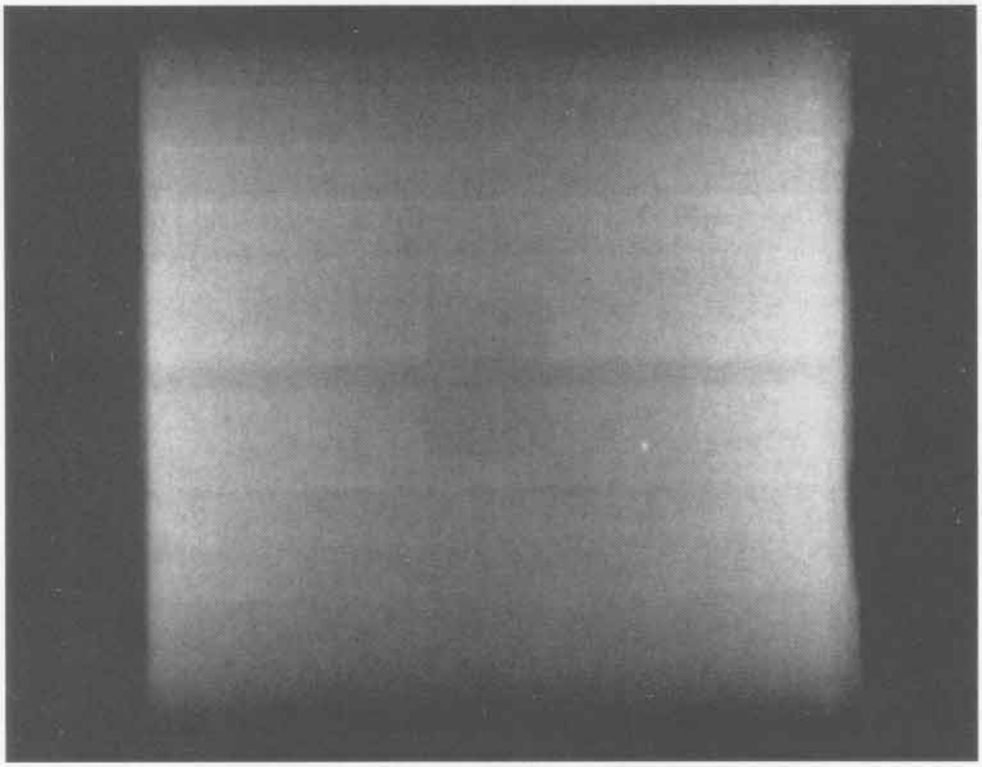


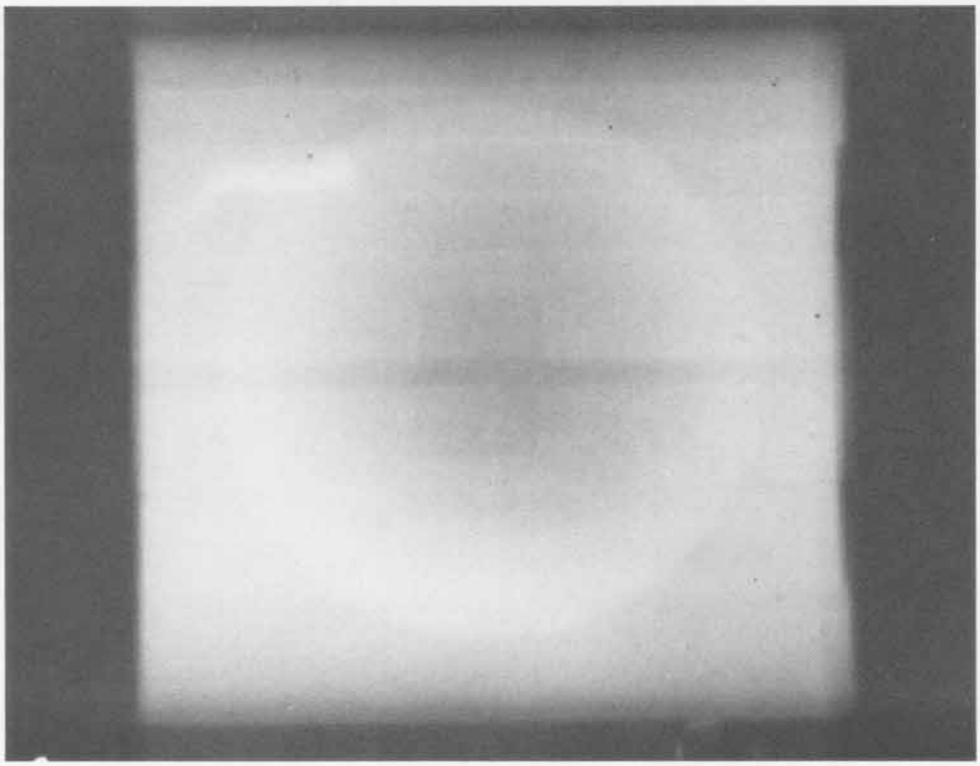


SHOT 989: **Spherically Diverging PBX-9404 Detonation**
Date: November 7, 1968
Experimenter: Douglas Venable
Radiographic Time: 26.31 μs

A 152.4-mm-high by 152.4-mm-diameter cylinder of PBX-9404 was center-initiated by composite hemispheres of PBX-9407 and PETN, which were center-initiated by a length of MDF (mild detonating fuse). Four 0.0254-mm-thick tantalum foils were embedded in the PBX-9404 every 12.7 mm. See Shot 988.

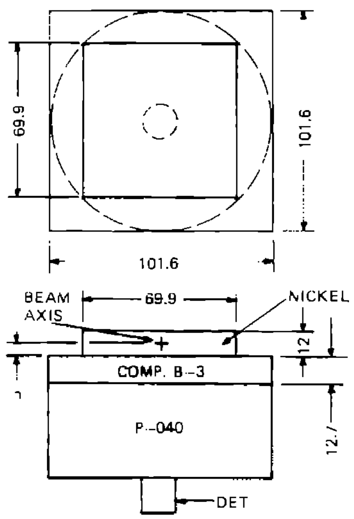


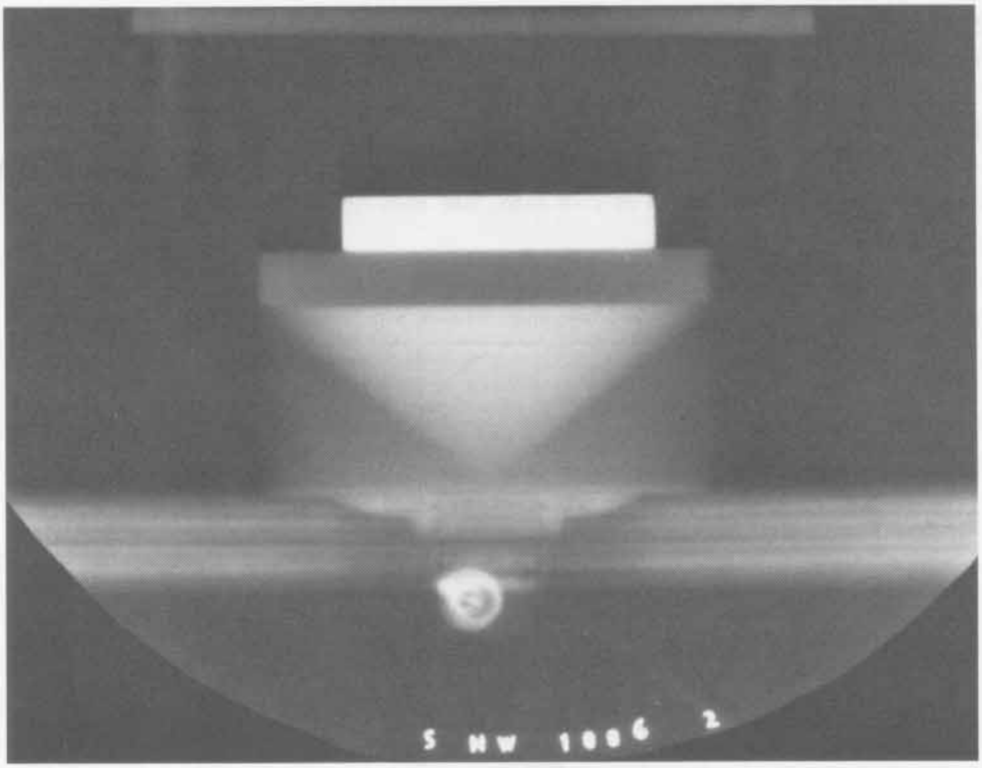




SHOT 1006: **Dynamic Fracture of Nickel**
Date: April 1, 1969
Experimenter: Roger W. Taylor
Radiographic Time: 33.12 μs
References: Breed et al., 1967; Thurston and Mudd, 1968

Nickel of 12.0-mm thickness was dynamically fractured. The plate was shocked by 12.7 mm of Composition B-3 initiated by a P-040 lens. h was 14.4 mm. The reference bar is shown, and the spalled plate has interacted with a timing pin.

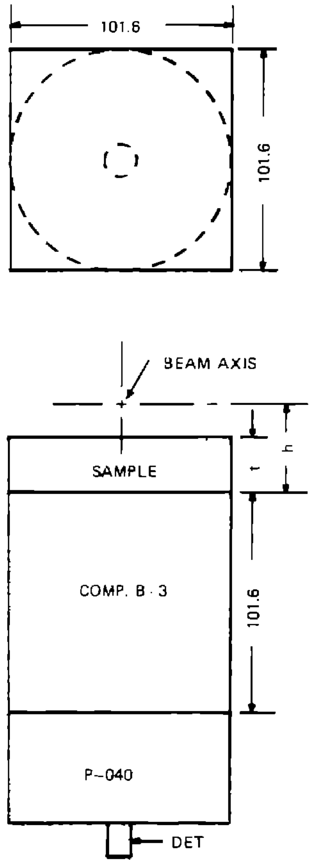


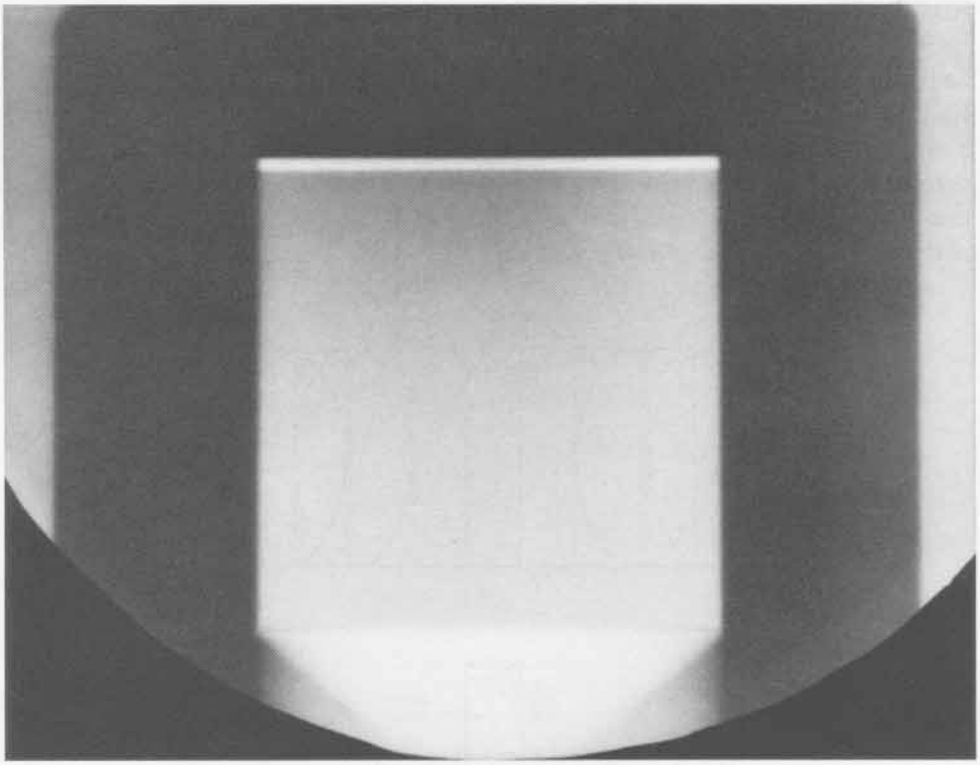

5 NW 1006 2

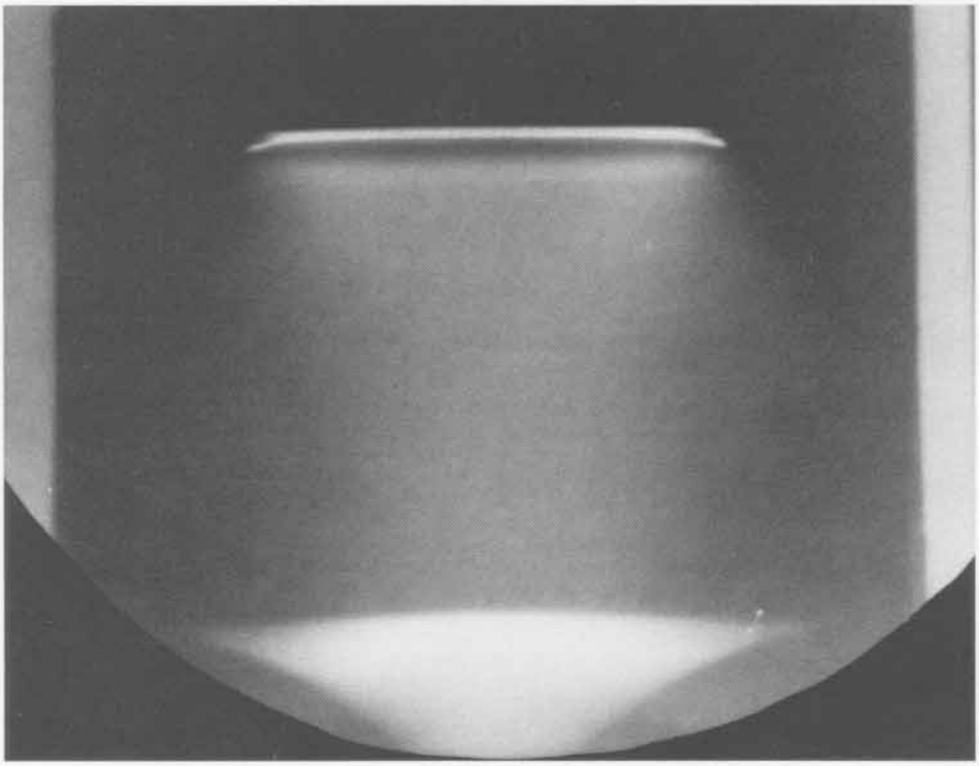

NW 1006 2

SHOT 1007: **Deformation of Thin Aluminum Plates**
Date: July 29, 1969
Experimenter: Douglas Venable
Radiographic Time: 28.07 μs

A 3.0-mm-thick aluminum plate, t, was shocked by 101.6 mm of Composition B-3 initiated by a P-040 lens. h is 7.76 mm. See also Shots 1012 and 1016.

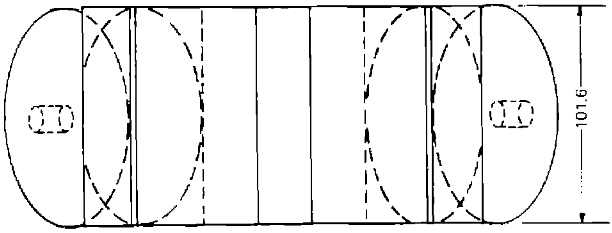


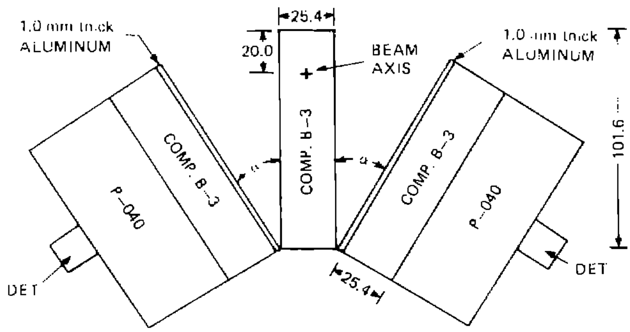


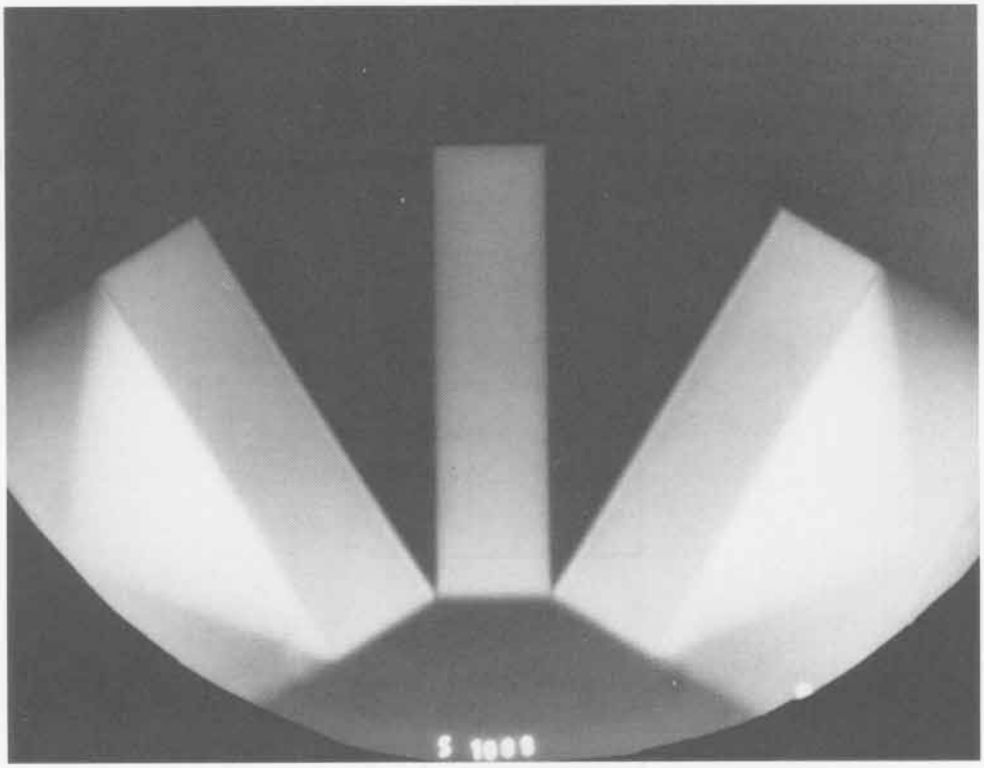


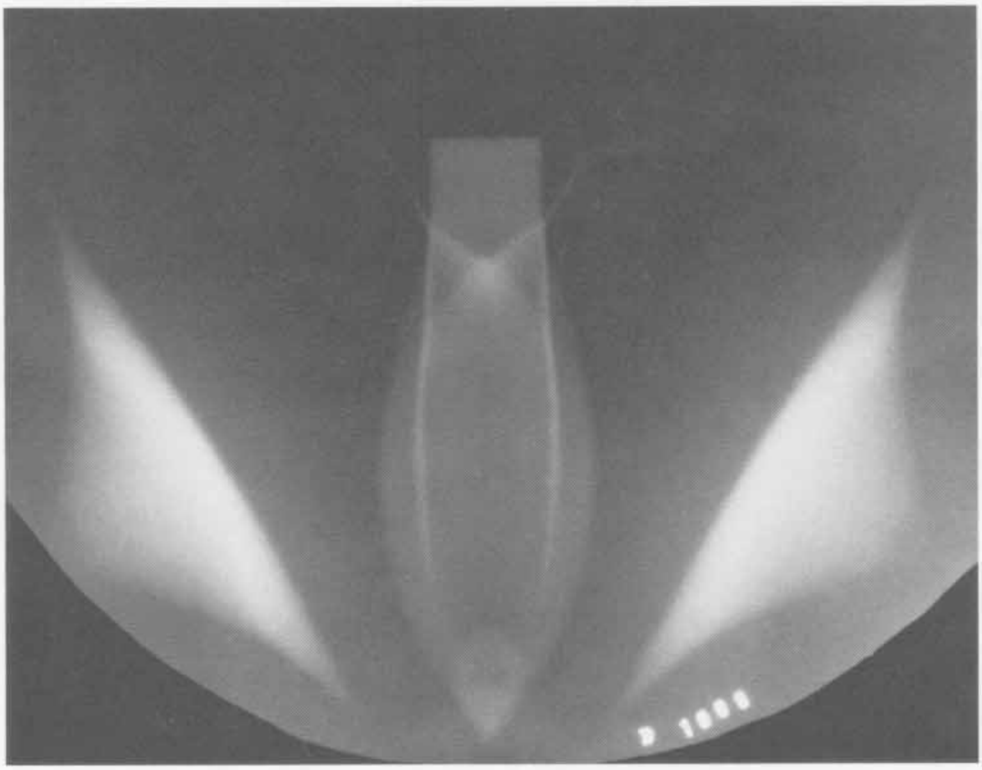
SHOT 1008: **Mach Reflection in Composition B-3**
Date: May 21, 1969
Experimenter: Douglas Venable
Radiographic Time: 25.54 μs

Two Composition B-3 detonation waves interacted to form a Mach reflection. The detonation waves were initiated by 1.0-mm-thick aluminum plates driven by 25.4-mm-thick slabs of Composition B-3 initiated by P-040 lenses. The angle of the plates, α, was 31°. See also Shots 1013, 1018, and 1224.



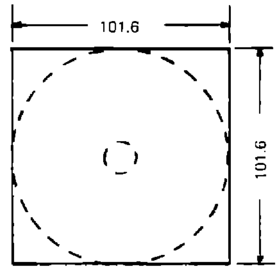


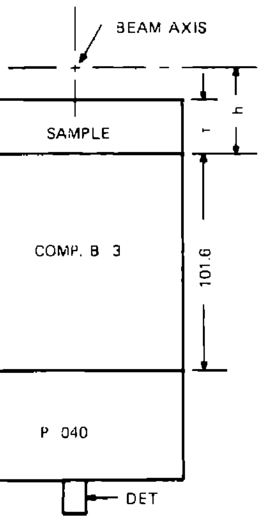

S 1000

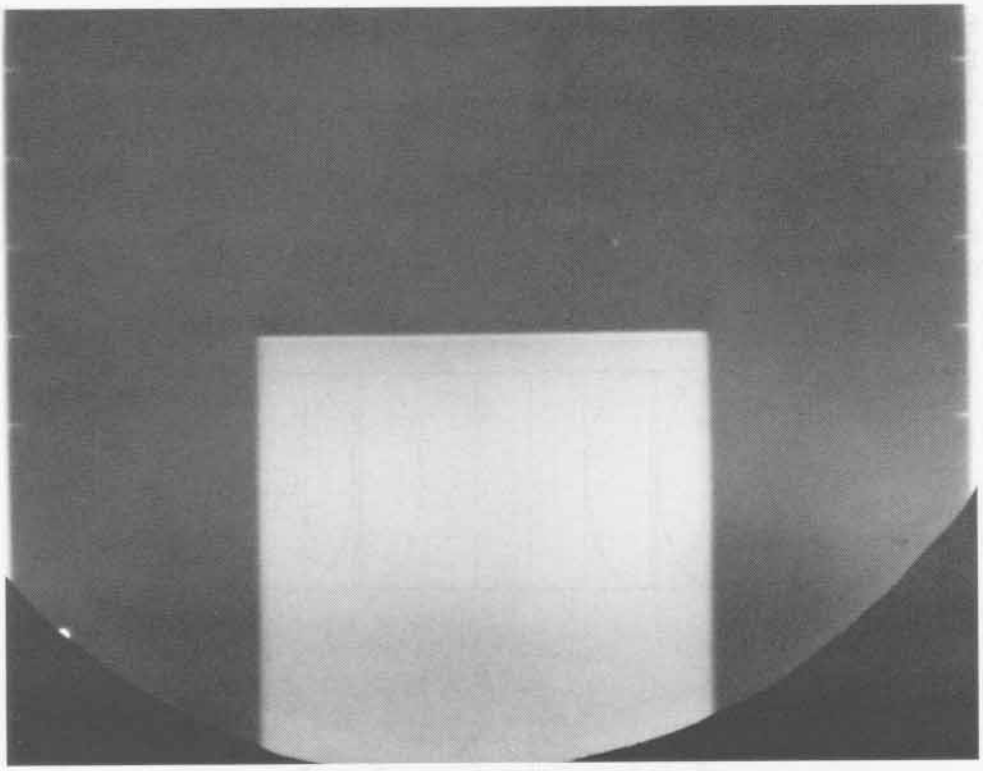

D 1000

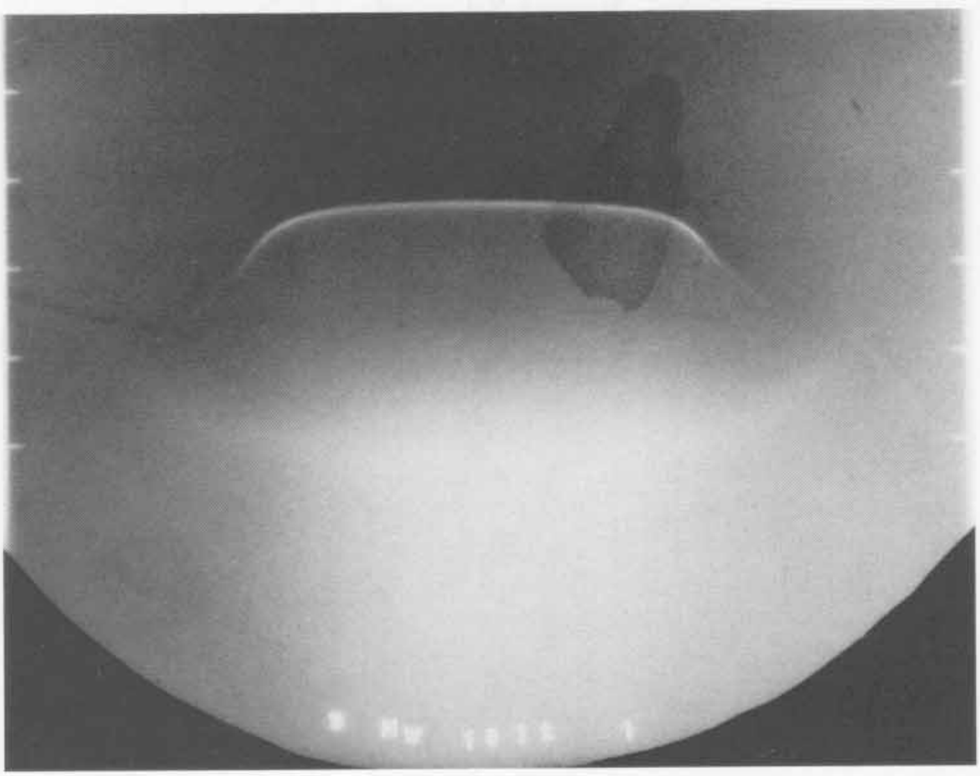
SHOT 1012: **Deformation of Thin Aluminum Plates**
Date: April 2, 1969
Experimenter: Douglas Venable
Radiographic Time: 32.69 μs

A 1.0-mm-thick aluminum plate, t, was shocked by 101.6 mm of Composition B-3 initiated by a P-040 lens. h was 38.1 mm. See also Shots 1007 and 1016.



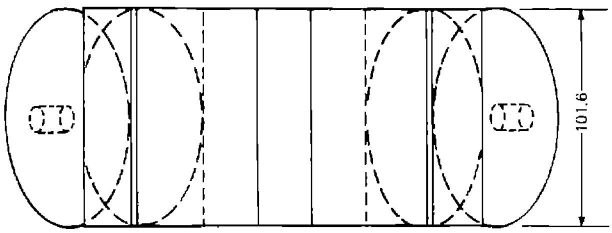


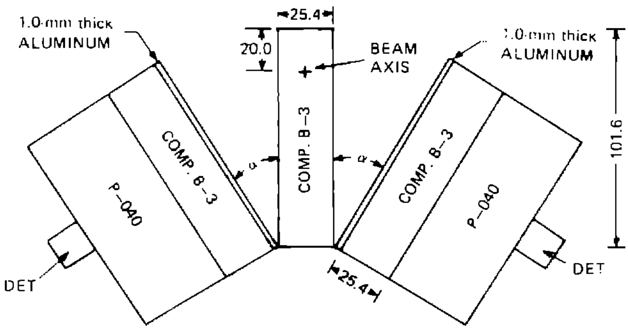


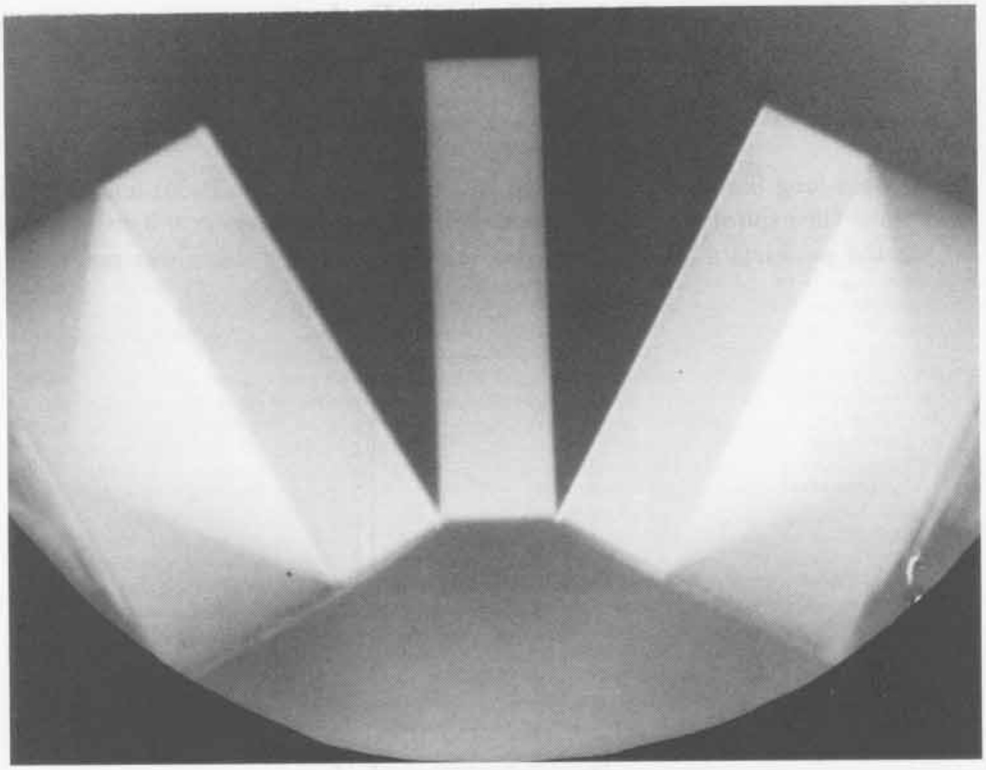


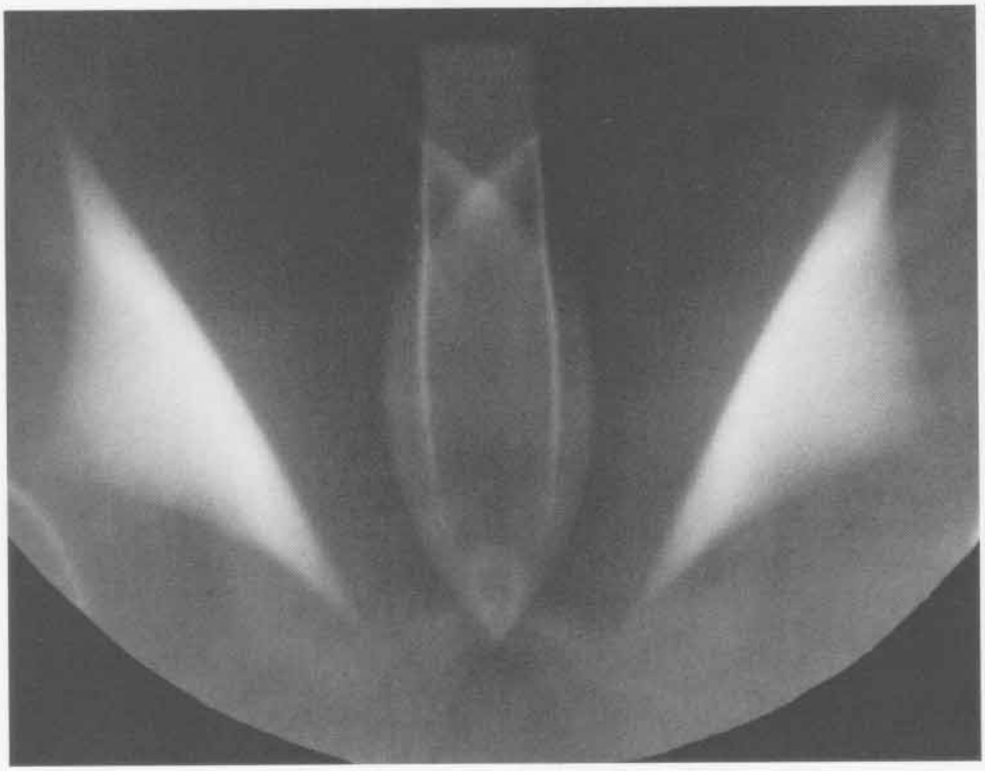
SHOT 1013: **Mach Reflection in Composition B-3**
Date: April 3, 1969
Experimenter: Douglas Venable
Radiographic Time: 24.93 μs

Two Composition B-3 detonation waves interacted to form a Mach reflection. The detonation waves were initiated by 1.0-mm-thick aluminum plates driven by 25.4-mm-thick slabs of Composition B-3 initiated by P-040 lenses. The angle of the plates, α, is 29°. See also Shots 1008, 1018, and 1224.



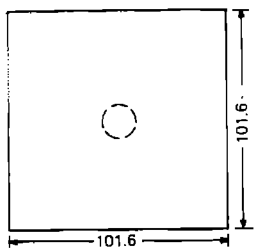


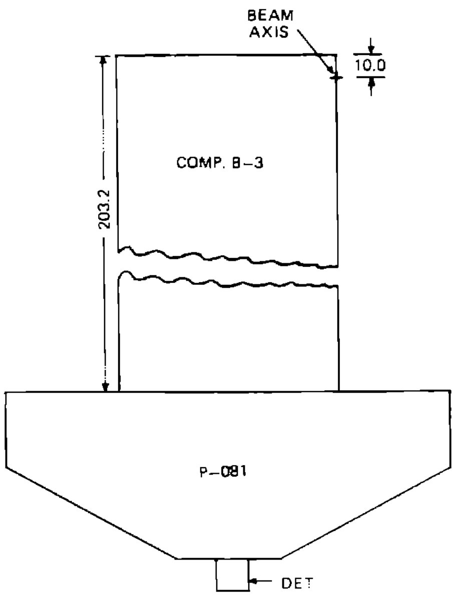


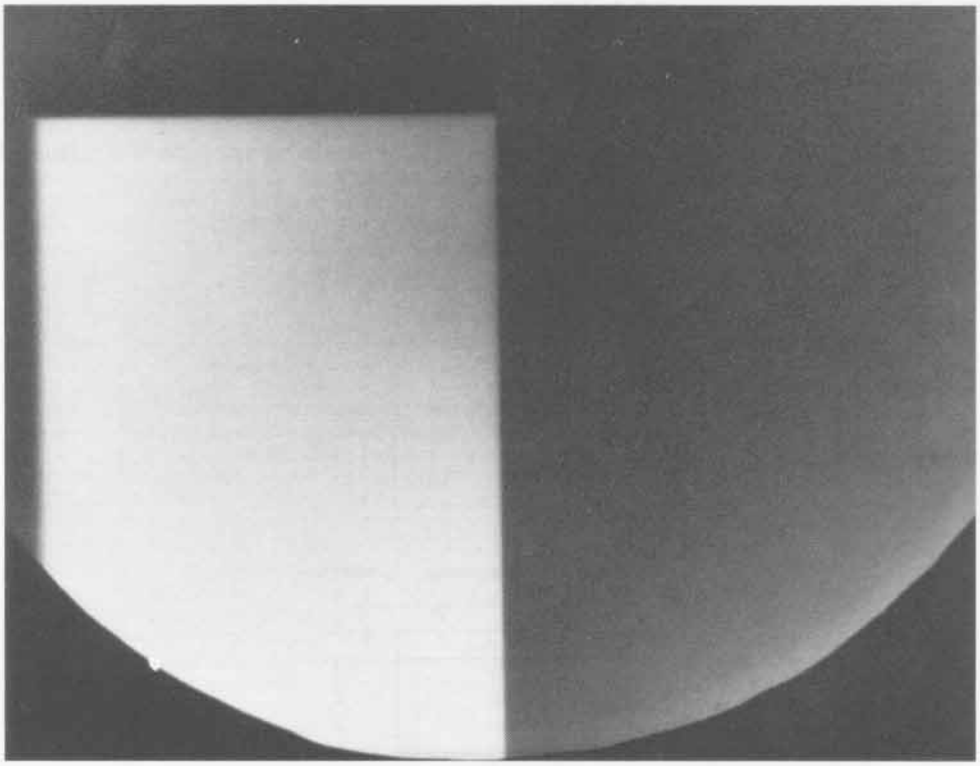


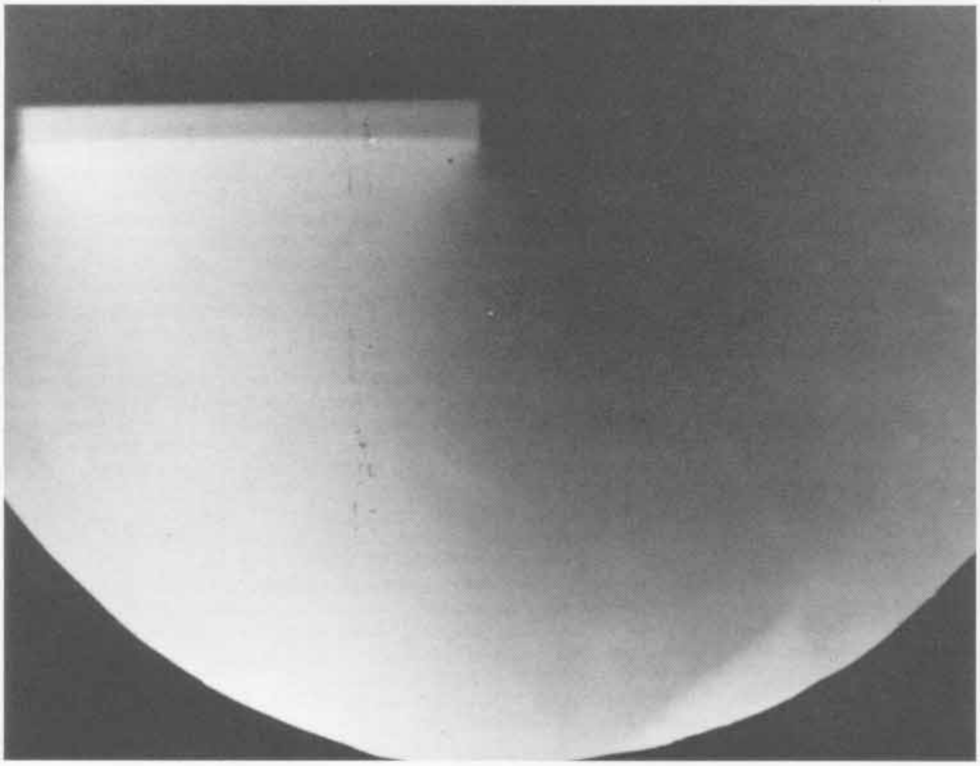
SHOT 1014: **Dammed Explosive Products**
Date: April 2, 1969
Experimenter: Douglas Venable
Radiographic Time: 47.02 μs
Reference: Davis and Venable, 1973

A 203.2-cm-long block of Composition B-3 was initiated by a P-081 lens. The expansion of the explosive products into air showed a narrow region of increased density in the products adjacent to the air interface. The air shock was not seen.









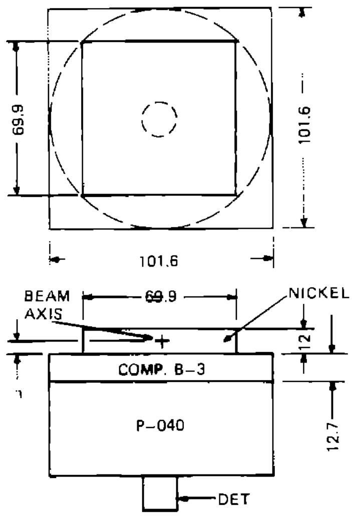
SHOT 1015: **Nickel Back Surface**

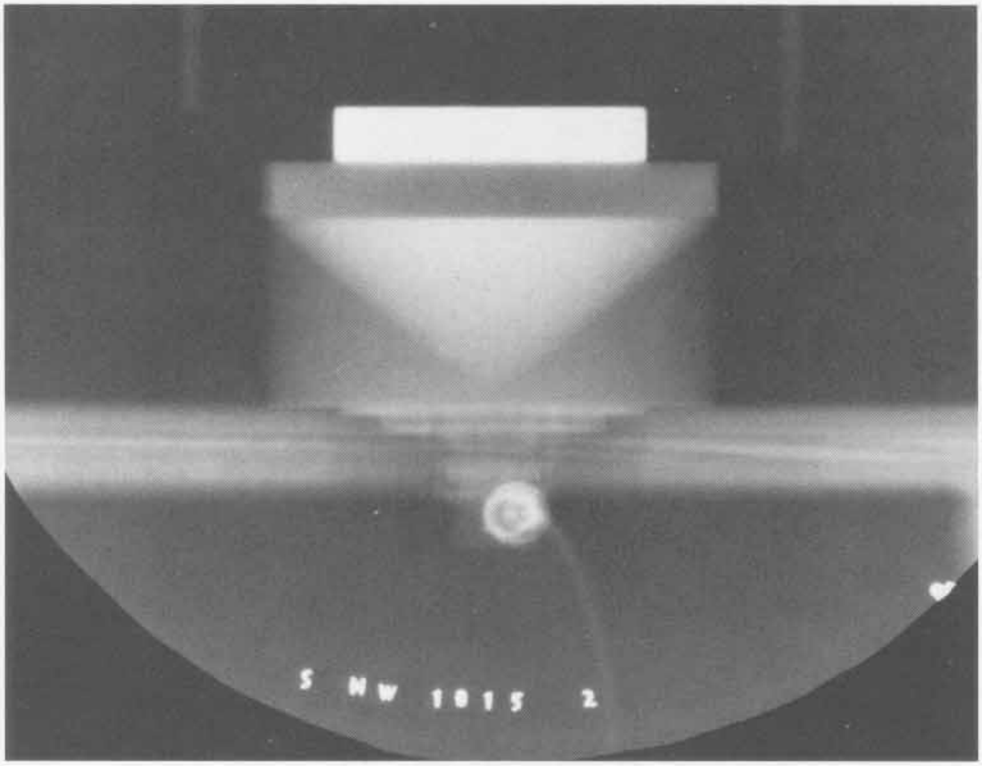
Date: April 23, 1969

Experimenter: Roger W. Taylor

Radiographic Time: 21.08 μs

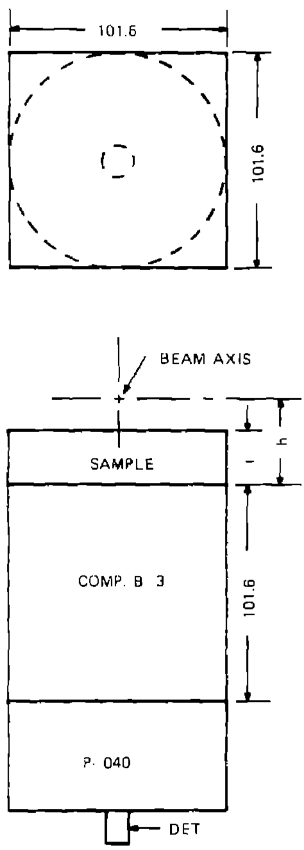
A 12.0-mm-thick nickel plate was shocked by 12.7 mm of Composition B-3 initiated by a P-040 lens. h was 2.2 mm.

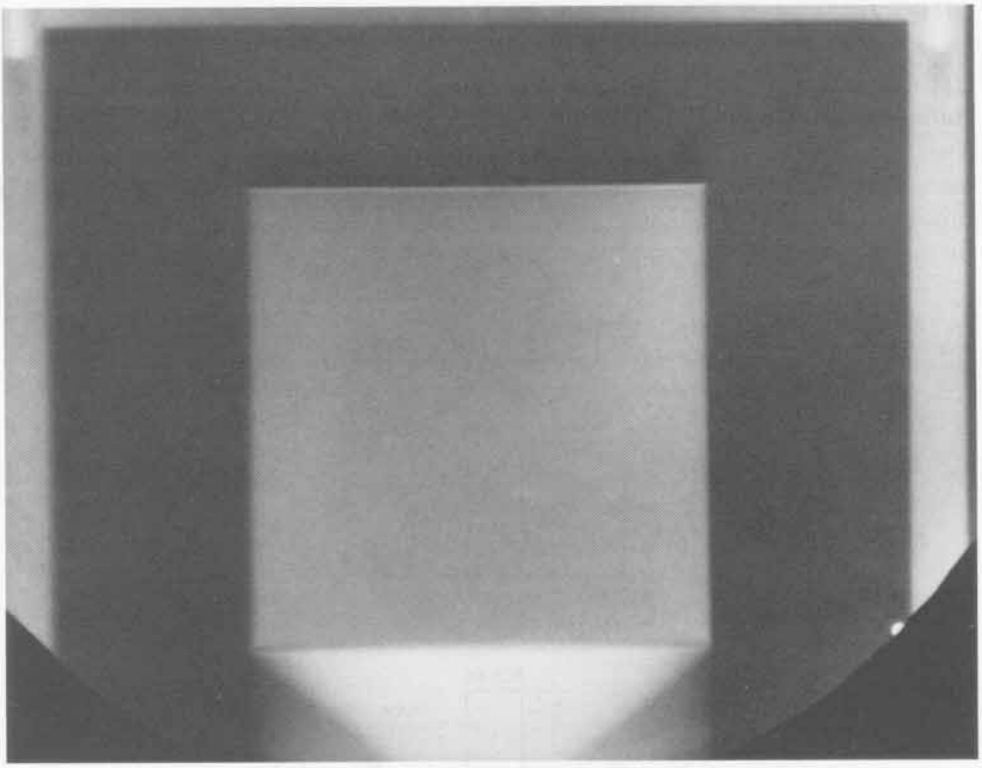


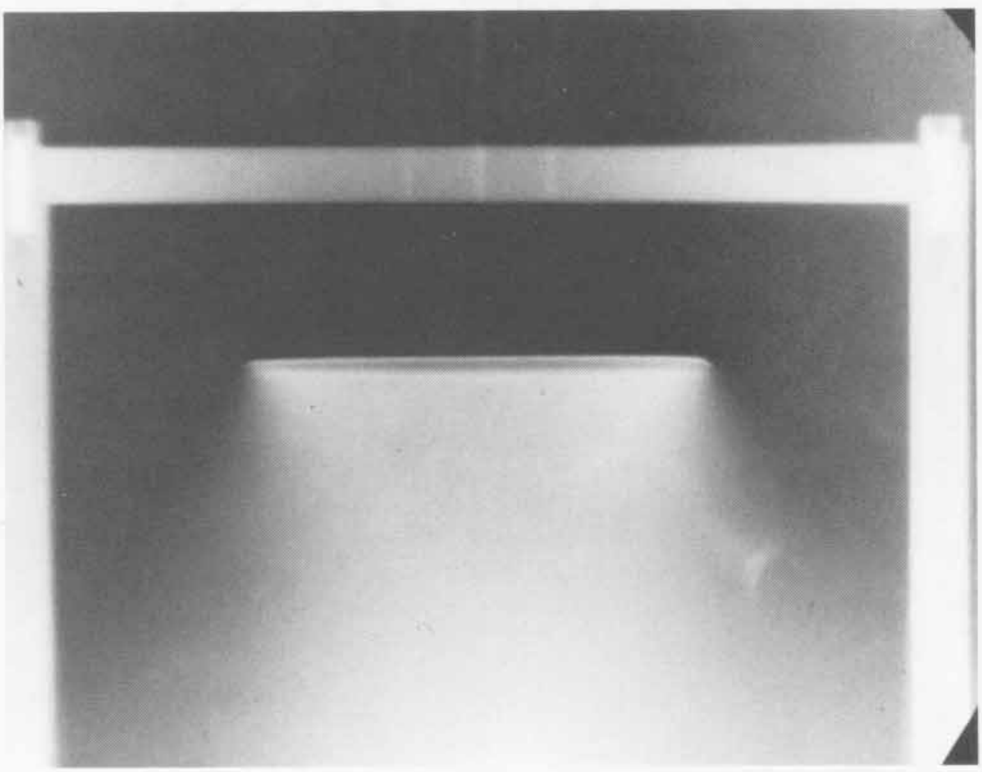

S NW 1015 2

SHOT 1016: **Deformation of Thin Aluminum Plates**
Date: May 7, 1969
Experimenter: Douglas Venable
Radiographic Time: 27.08 μs

A 1.0-mm-thick aluminum plate, t, was shocked by 101.6 mm of Composition B-3 initiated by a P-040 lens. h was 5.76 mm. See also Shots 1007 and 1012.

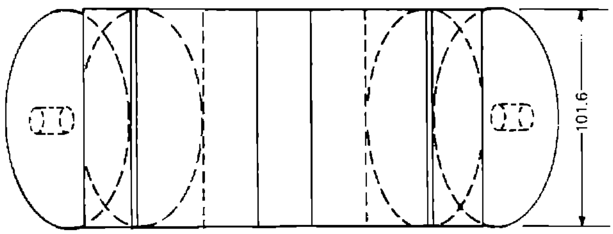


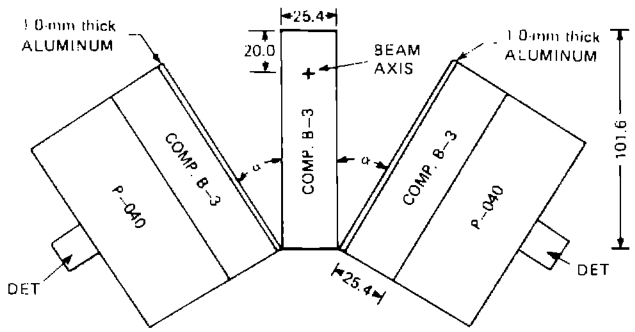


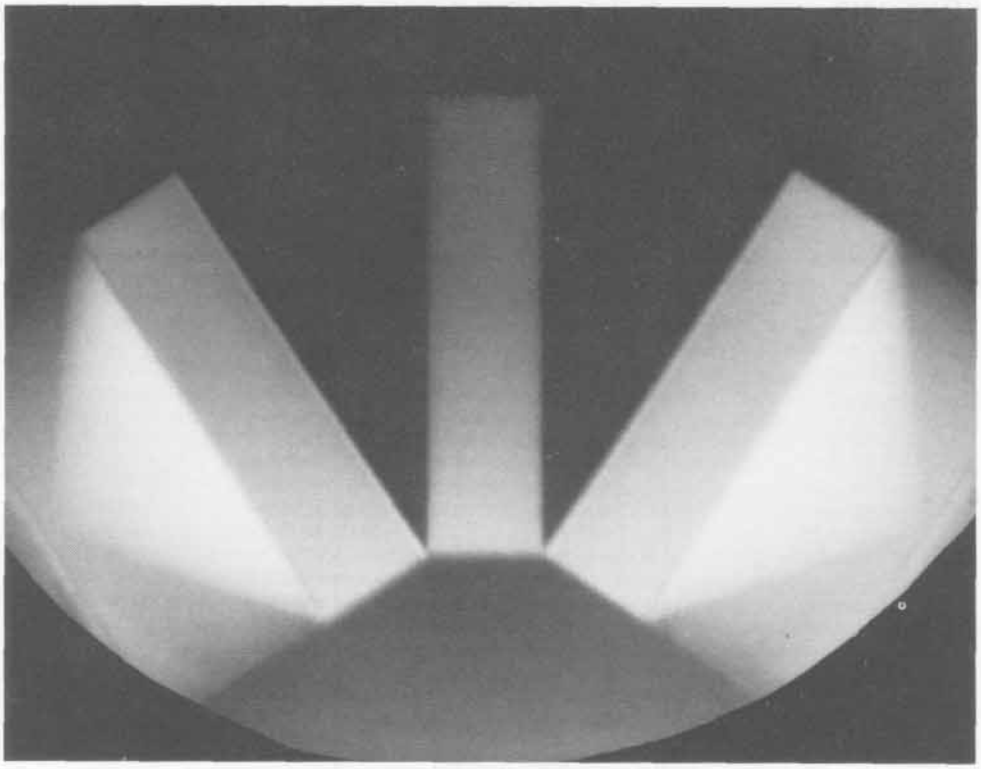


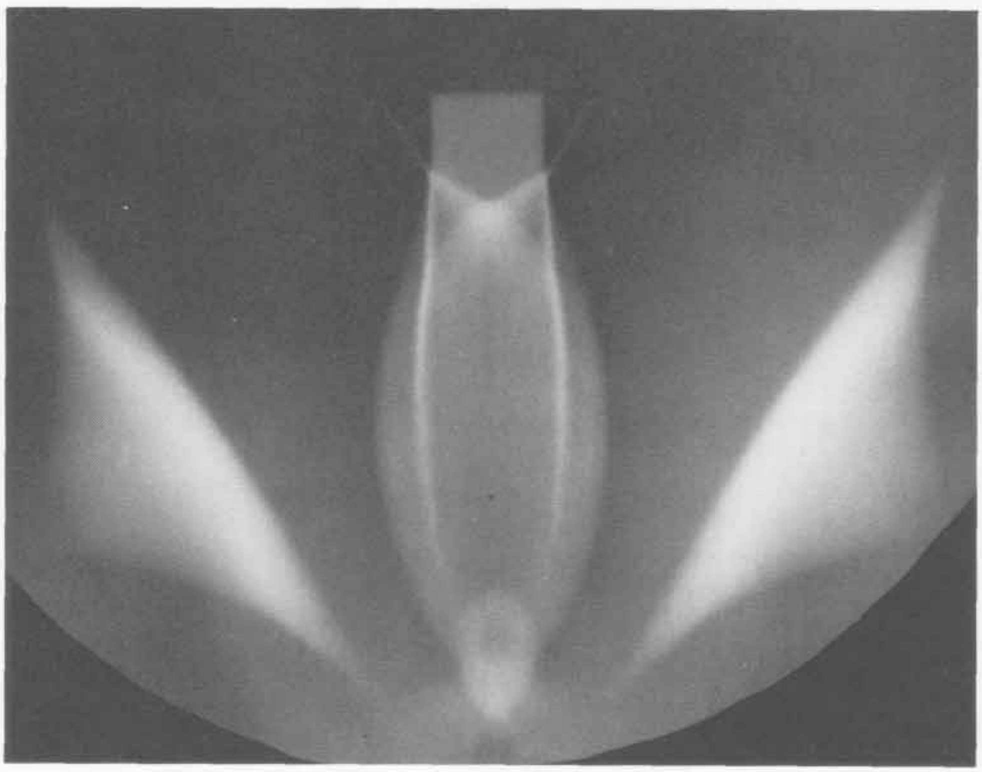
SHOT 1018: **Mach Reflection in Composition B-3**
Date: July 17, 1969
Experimenter: Douglas Venable
Radiographic Time: 26.28 μs

Two Composition B-3 detonation waves interacted to form a Mach reflection. The detonation waves were initiated by 1.0-mm-thick aluminum plates driven by 25.4-mm-thick slabs of Composition B-3 initiated by P-040 lenses. The angle of the plates, α, was 33°. See also Shots 1008, 1013, and 1224.



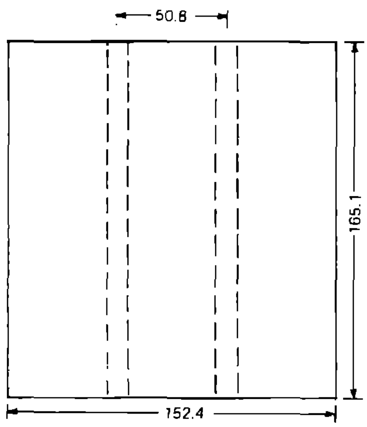


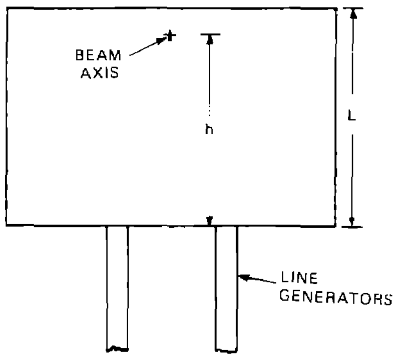


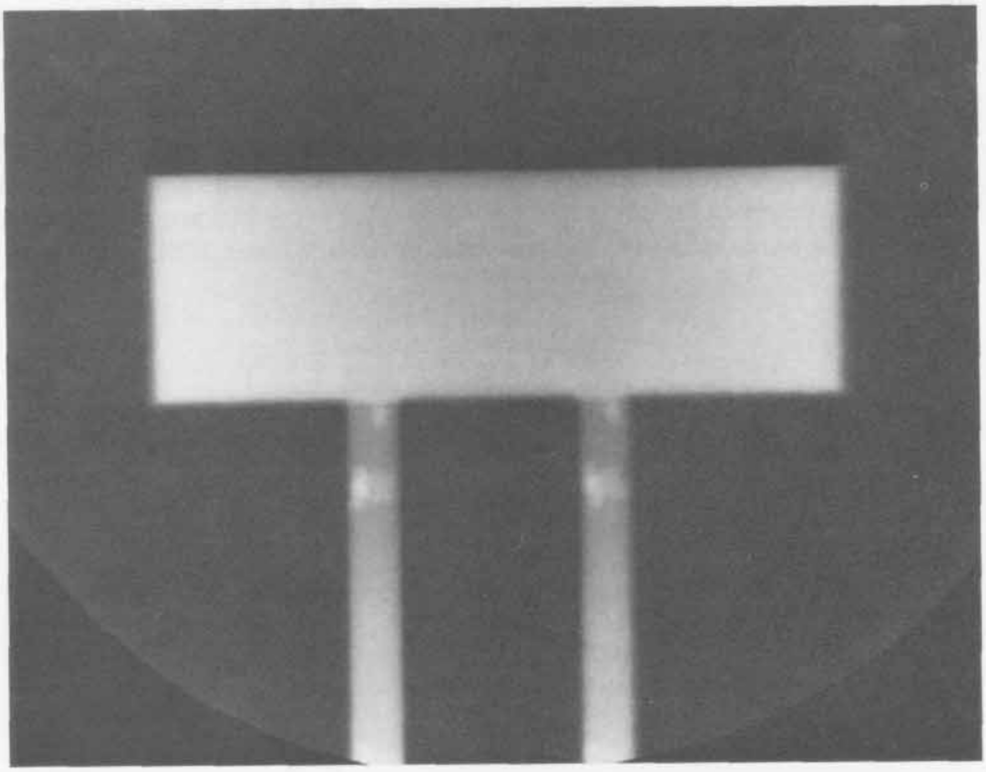


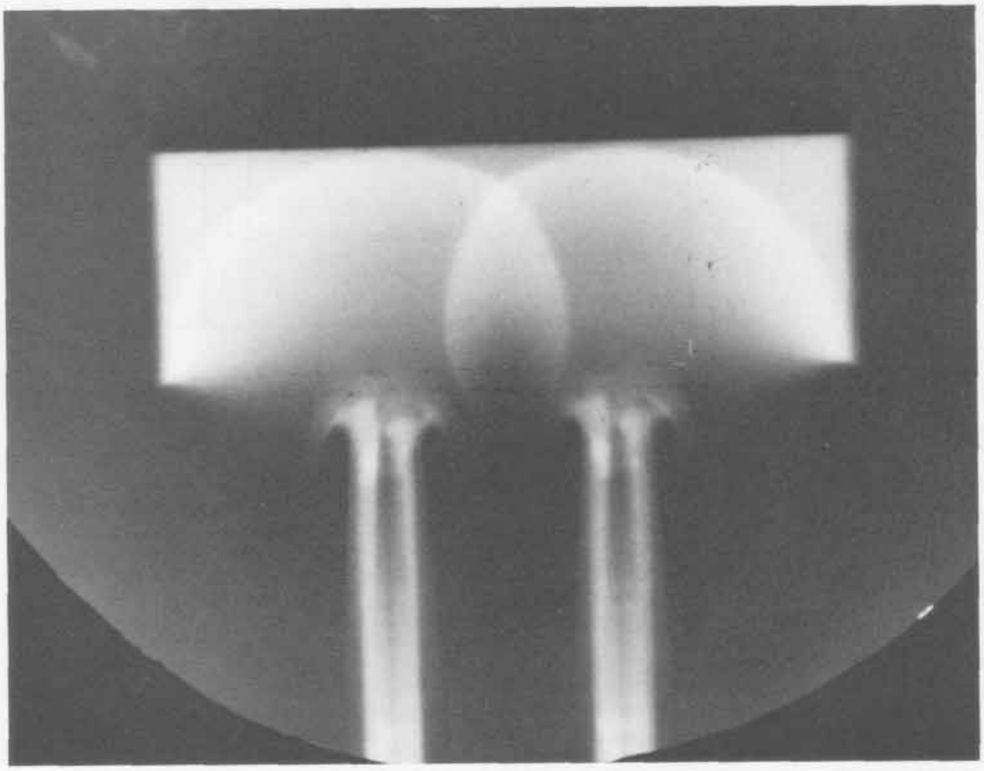
SHOT 1019: **Colliding PBX-9404 Cylindrical Detonation Waves**
Date: July 17, 1969
Experimenter: Douglas Venable
Radiographic Time: 26.91 μs
Reference: Mader and Venable, 1979

Two laterally colliding, diverging, cylindrical detonation waves in PBX-9404 were initiated by two line generators. The detonation waves traveled for 5.61 μs after arrival of the line generator shock wave. The length, L, of the charge was 50.8 mm. h was 43.94 mm. See also Shots 1037, 1038, 1130, 1143, 1159, and 1160.









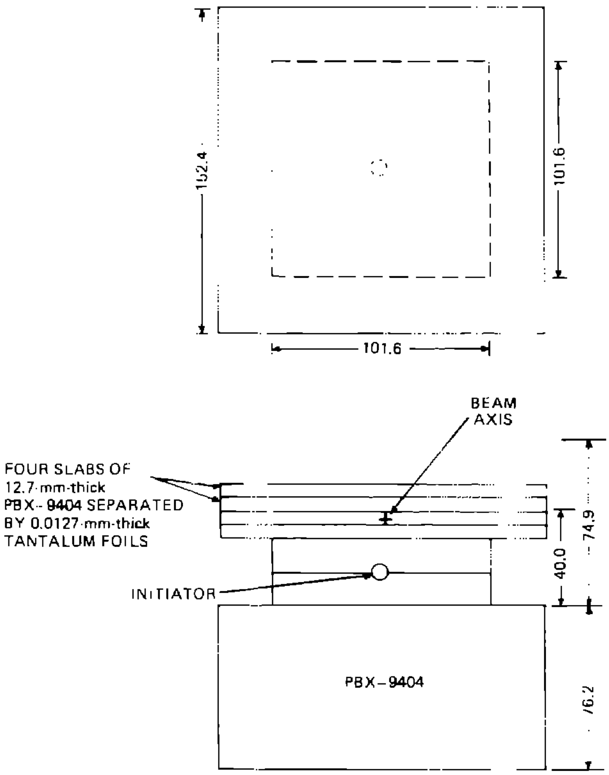
SHOT 1020: Spherically Diverging PBX-9404 Detonation

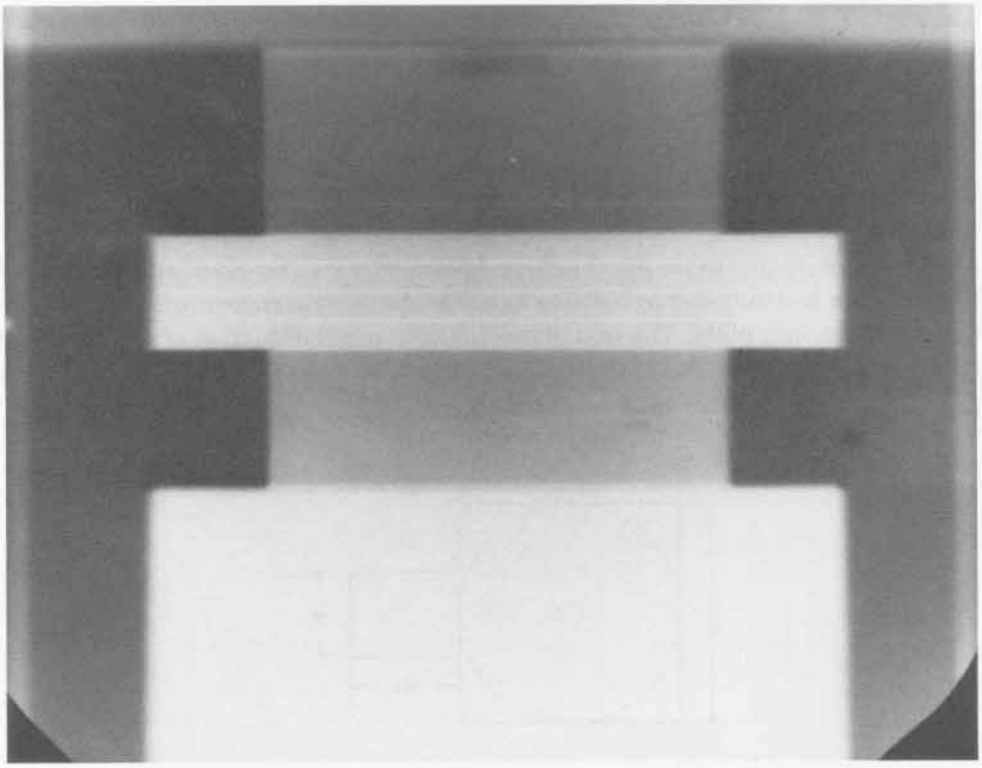
Date: July 29, 1969

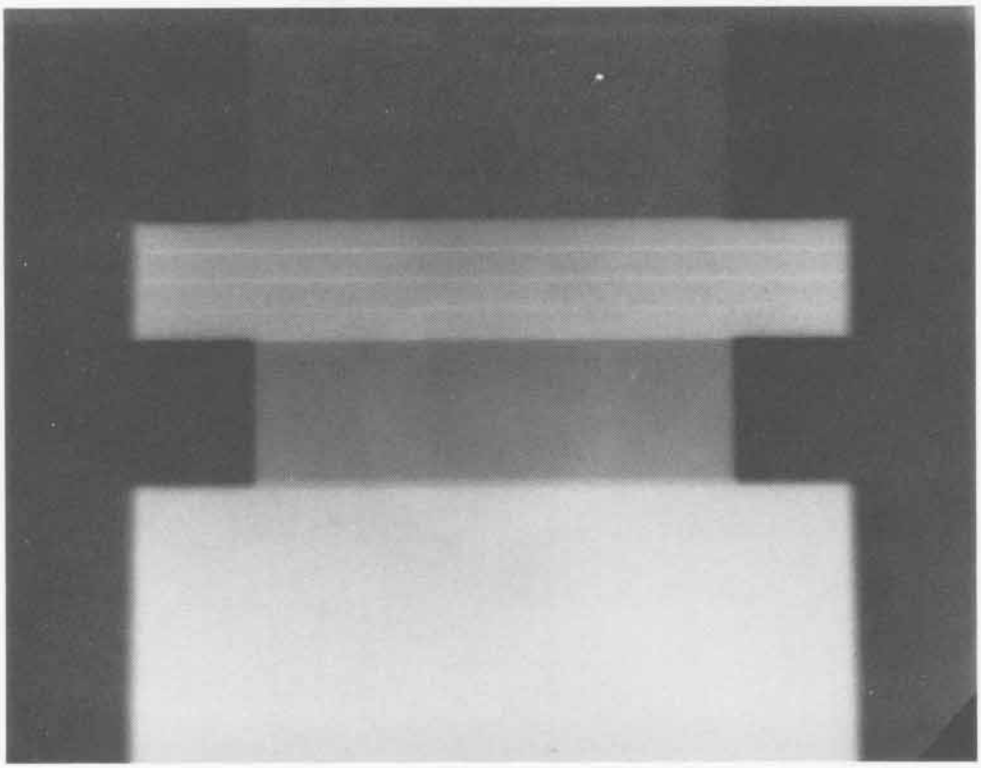
Experimenter: Douglas Venable

Radiographic Time: 22.58 μs

A block of PBX-9404 was center-initiated by composite hemispheres of PBX-9407 and PETN, which were center-initiated by a length of MDF (mild detonating fuse). Three 0.0127-cm-thick tantalum foils were embedded every 12.7 mm starting 15.24 cm above the initiator center. See also Shots 1031, 1033, and 1034.

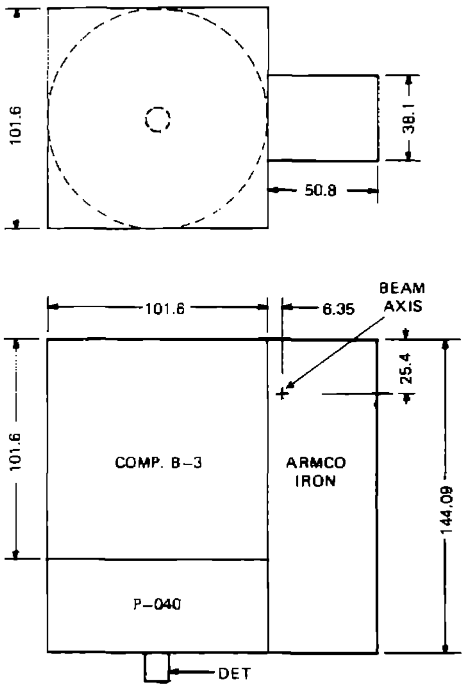


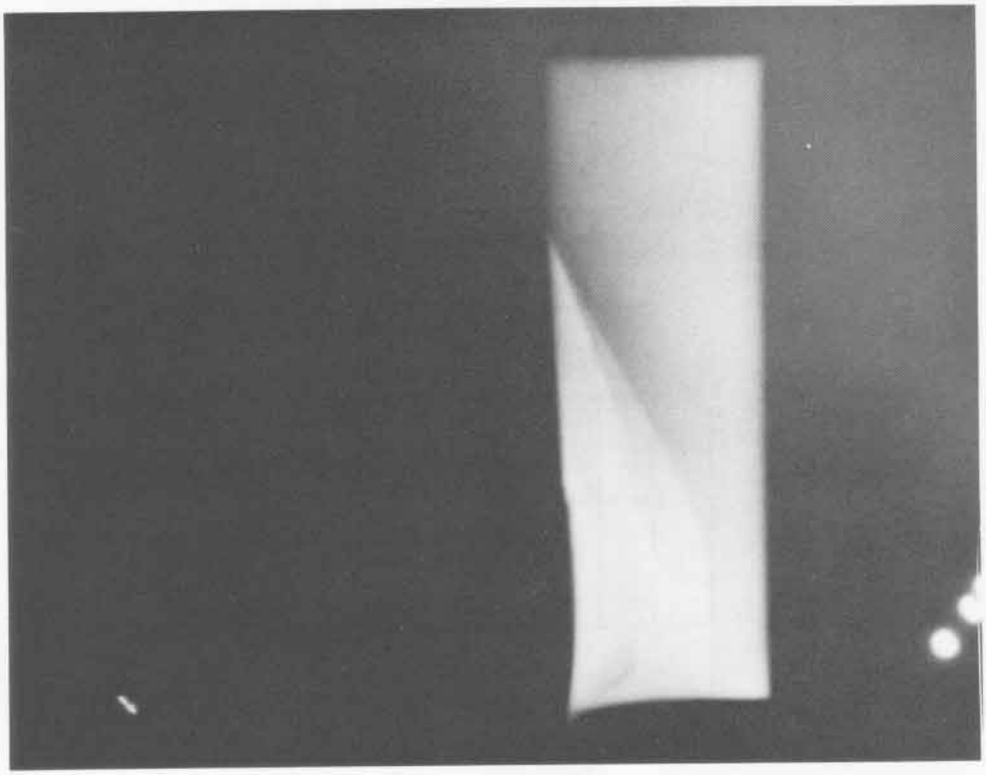




SHOT 1022: **Iron Phase Change**
Date: January 7, 1969
Experimenter: Eugene M. Sandoval
Radiographic Time: 23.13 μs

A 50.8- by 38.1- by 144.09-mm block of Armco iron was shocked by 101.6 mm of Composition B-3 initiated by a P-040 lens. The detonation wave proceeded perpendicular to the iron plate. The iron phase change caused formation of two shocks in the iron at the intersection of the detonation wave and the iron plate. These shocks spread apart as they traveled into the plate.





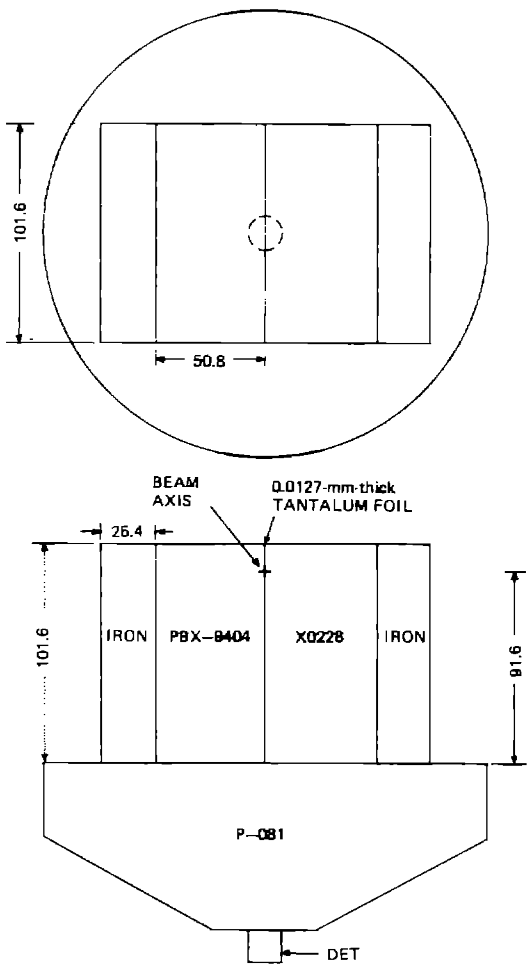
SHOT 1023: **PBX-9404 Shocking Nitroguanidine Obliquely**

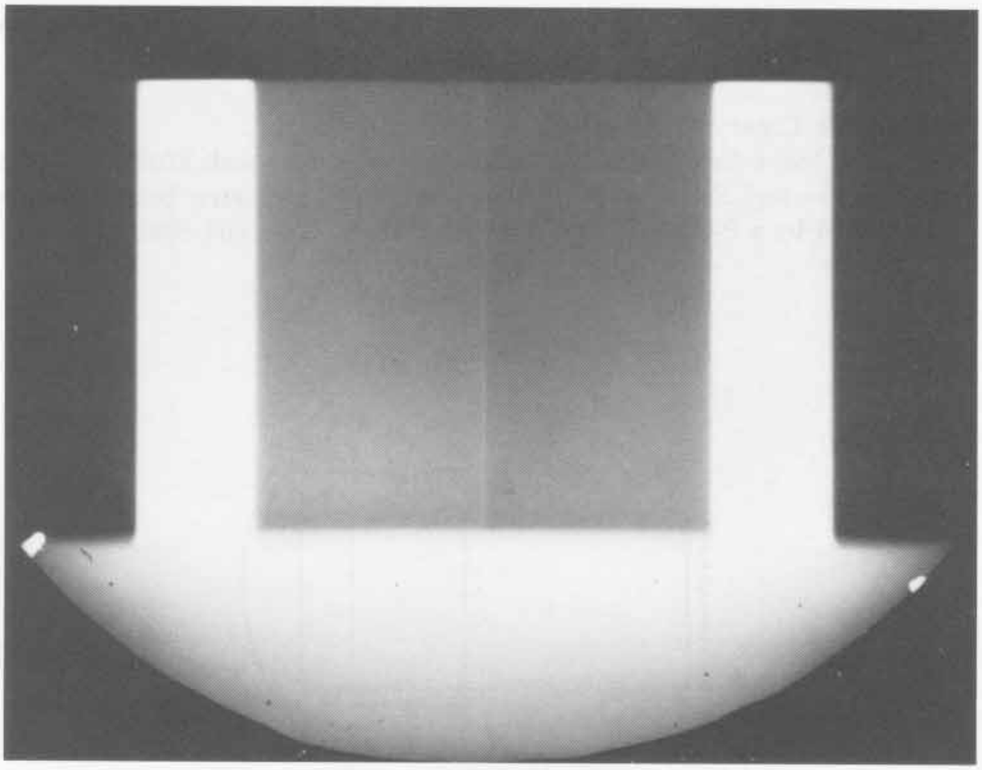
Date: January 23, 1969

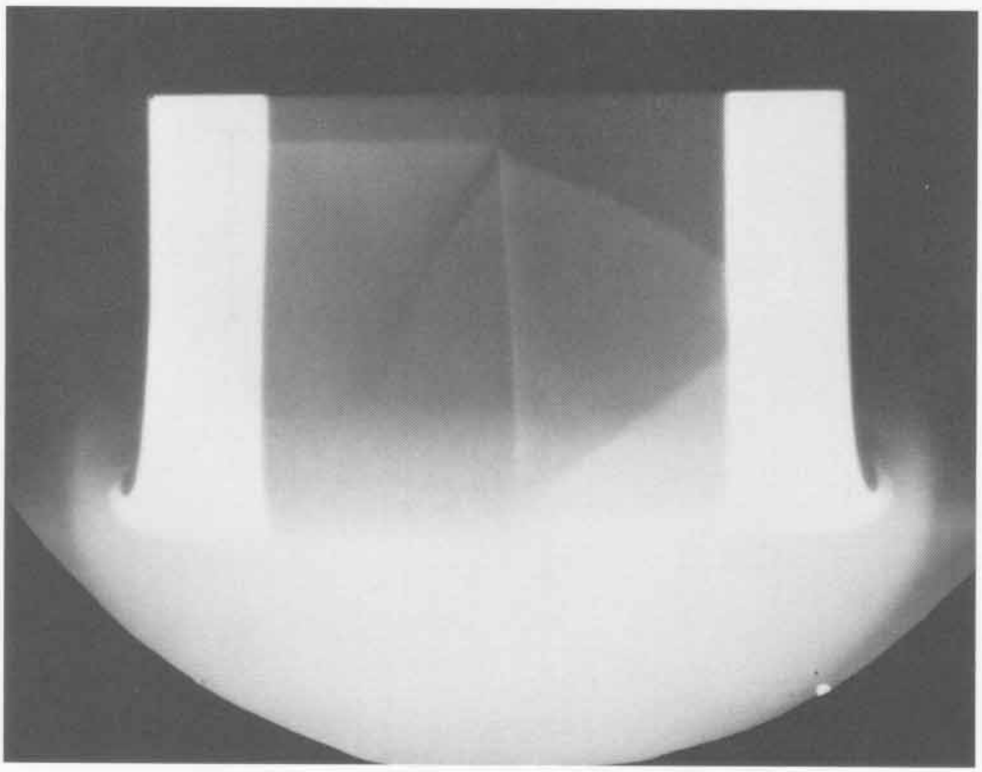
Experimenter: Douglas Venable

Radiographic Time: 32.9 μs

To examine how a PBX-9404 detonation interacted with X0228 (95/5 wt% nitroguanidine and Estane at 1.683 g/cm^3) in oblique geometry, both explosives were shocked by a P-081 lens. See Shots 1024, 1025, 1027, and 1046.

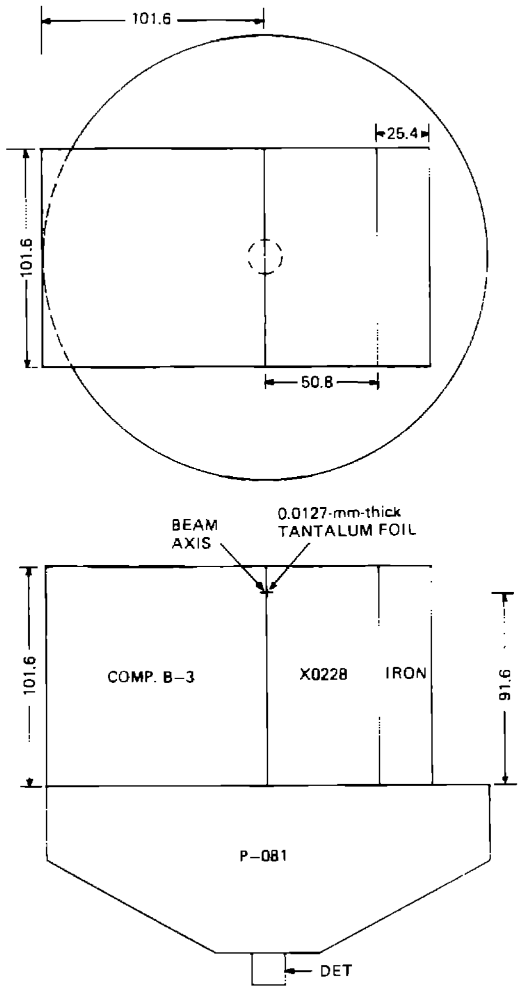


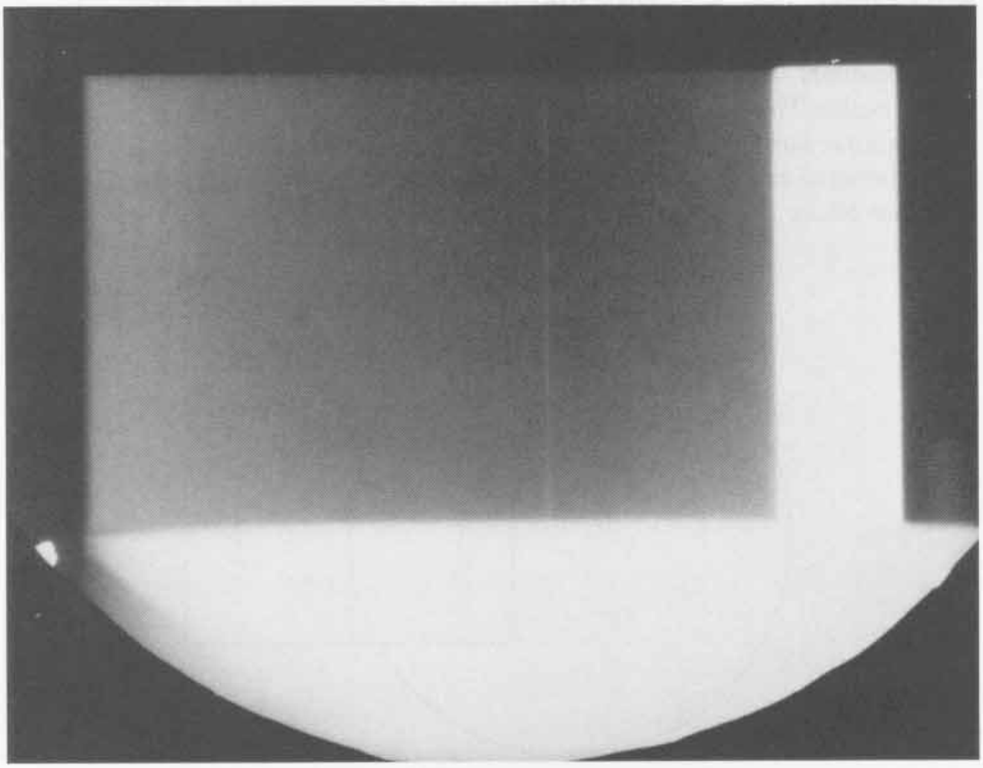


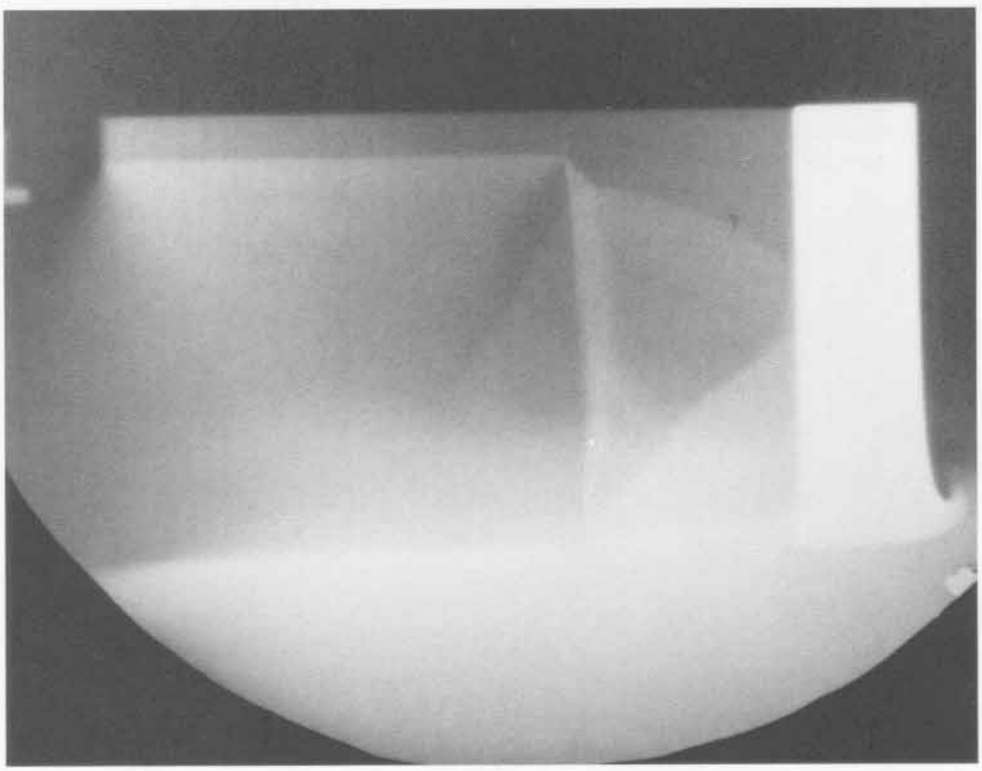


SHOT 1024: **Composition B-3 Shocking Nitroguanidine Obliquely**
Date: February 13, 1969
Experimenter: Douglas Venable
Radiographic Time: 34.14 μs

To examine how a Composition B-3 detonation interacted with X0228 (95/5 wt% nitroguanidine and Estane at 1.689 g/cm³) in oblique geometry, both explosives were shocked by a P-081 lens. See Shots 1023, 1025, 1027, and 1046.

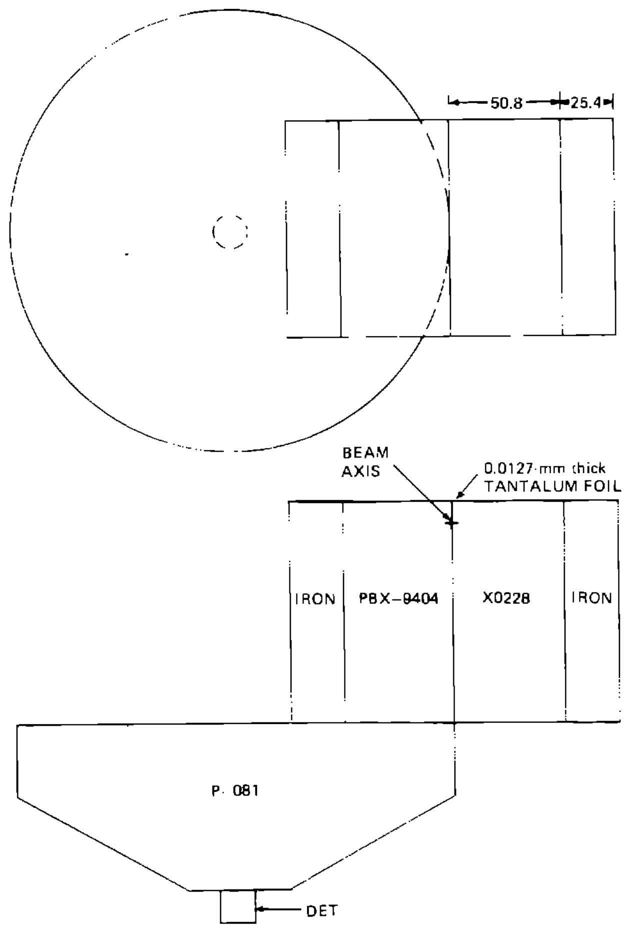


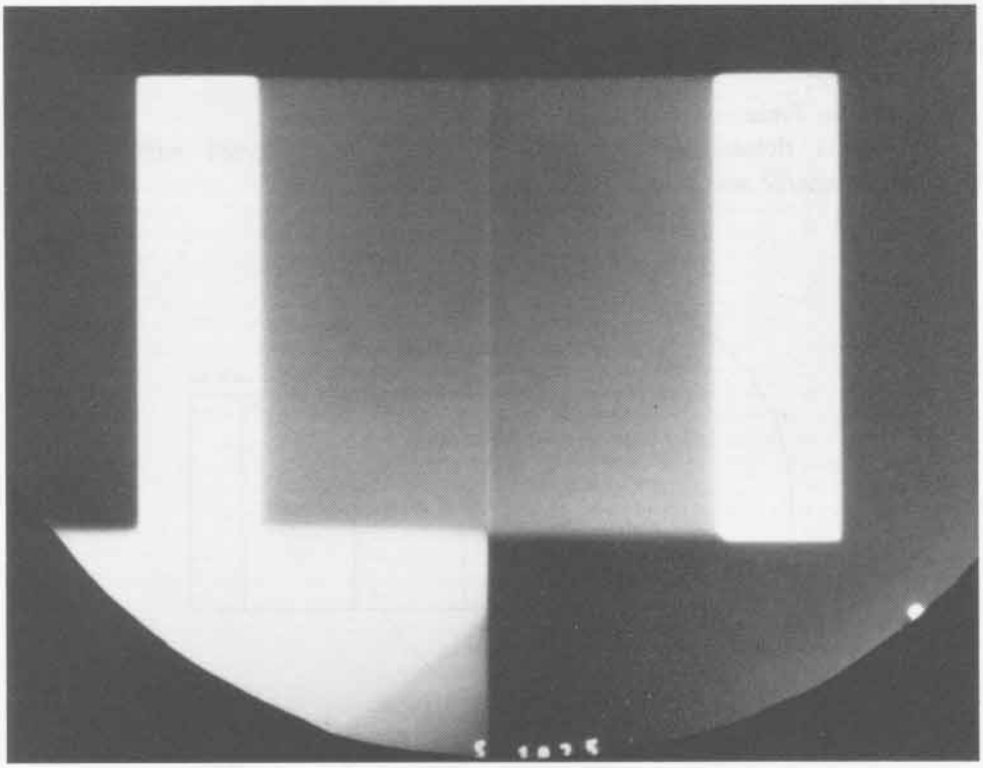


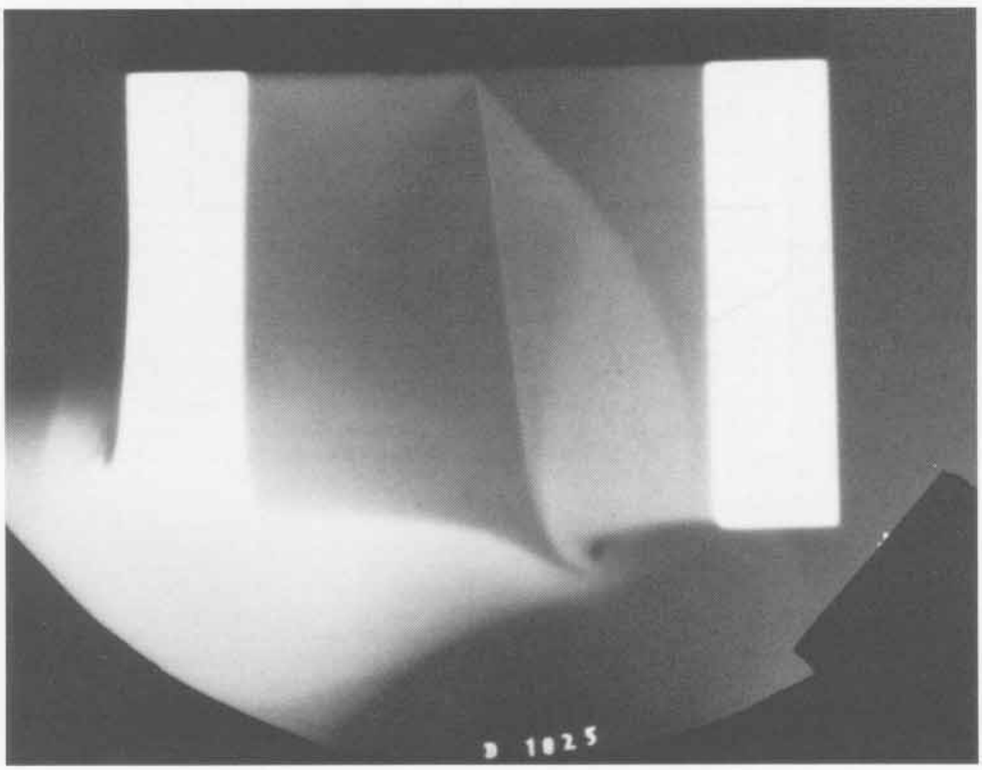


SHOT 1025: **PBX-9404 Shocking Nitroguanidine Obliquely**
Date: February 20, 1969
Experimenter: Douglas Venable
Radiographic Time: 33.85 μs

To examine how a PBX-9404 detonation obliquely shocked X0228 (95/5 wt% nitroguanidine and Estane at 1.689 g/cm^3), the PBX-9404 was initiated by a P-081 lens. See Shots 1023, 1024, 1027, and 1046.

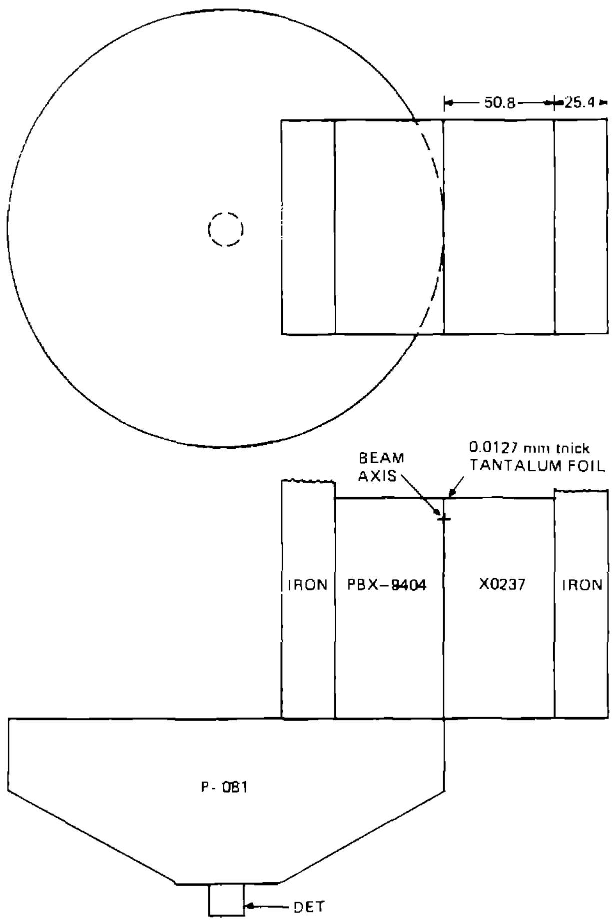


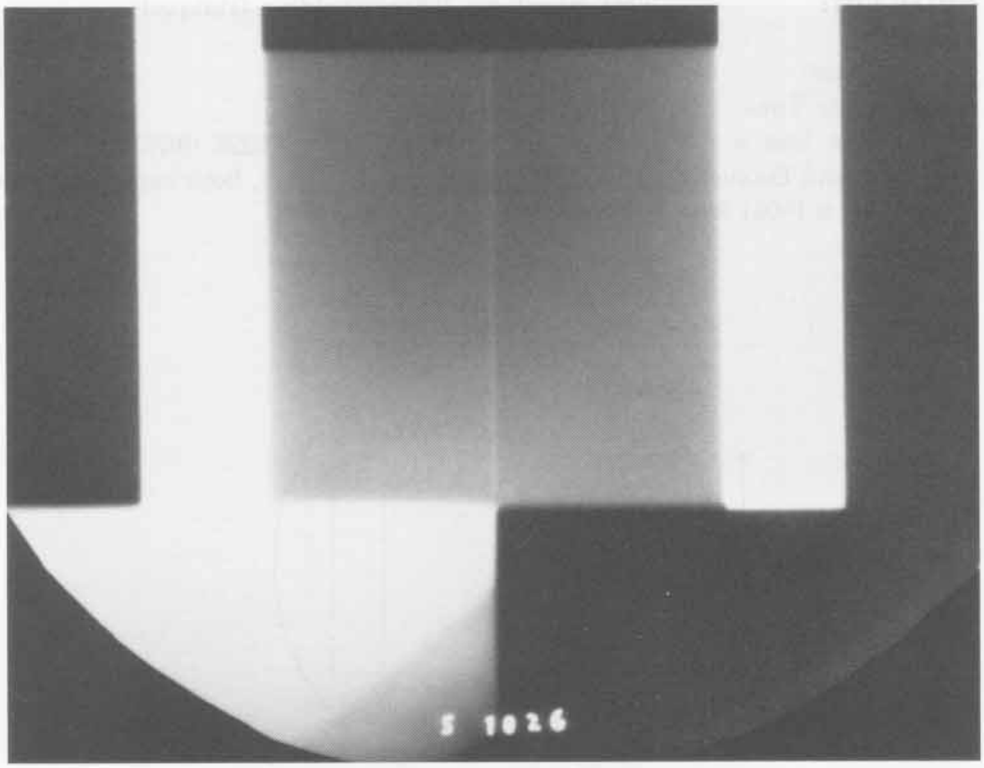


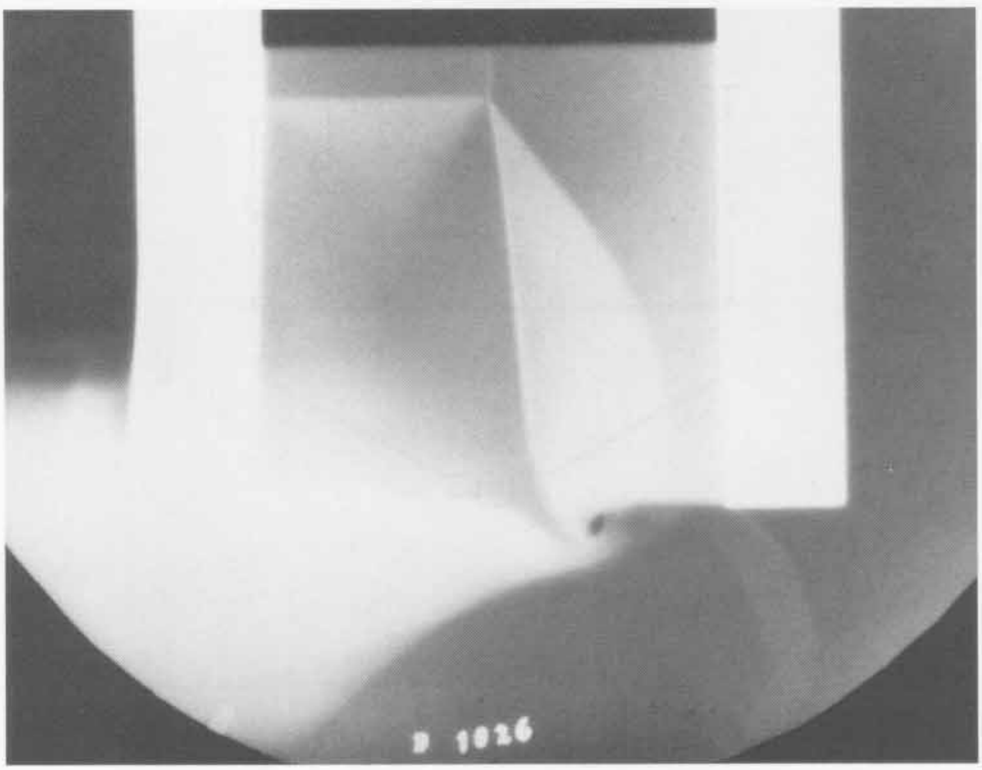


SHOT 1026: **PBX-9404 Shocking TATB Obliquely**
Date: February 25, 1969
Experimenter: Douglas Venable
Radiographic Time: 32.77 μs

A PBX-9404 detonation obliquely shocked X0237 (90/5/5 wt% triamino-trinitrobenzene/B[2] wax/Elvax at 1.740 g/cm^3).

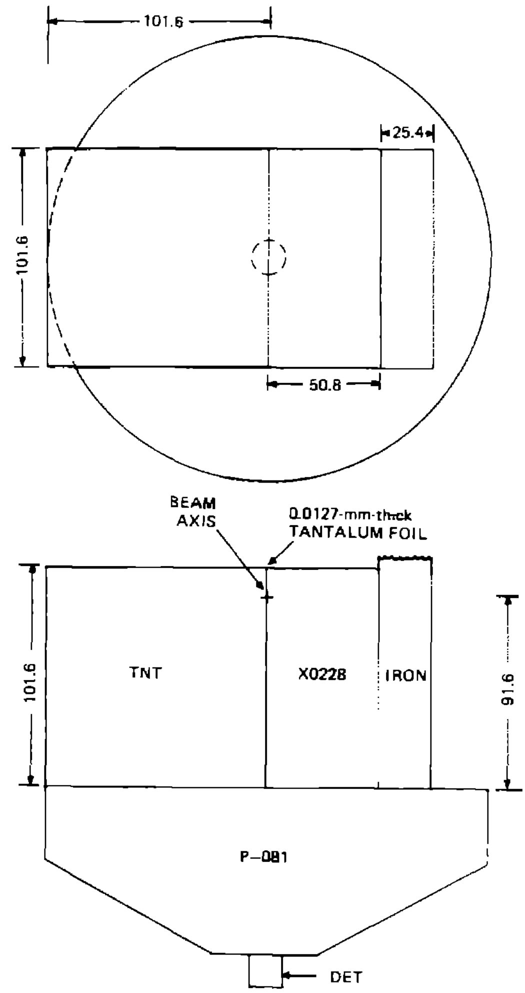


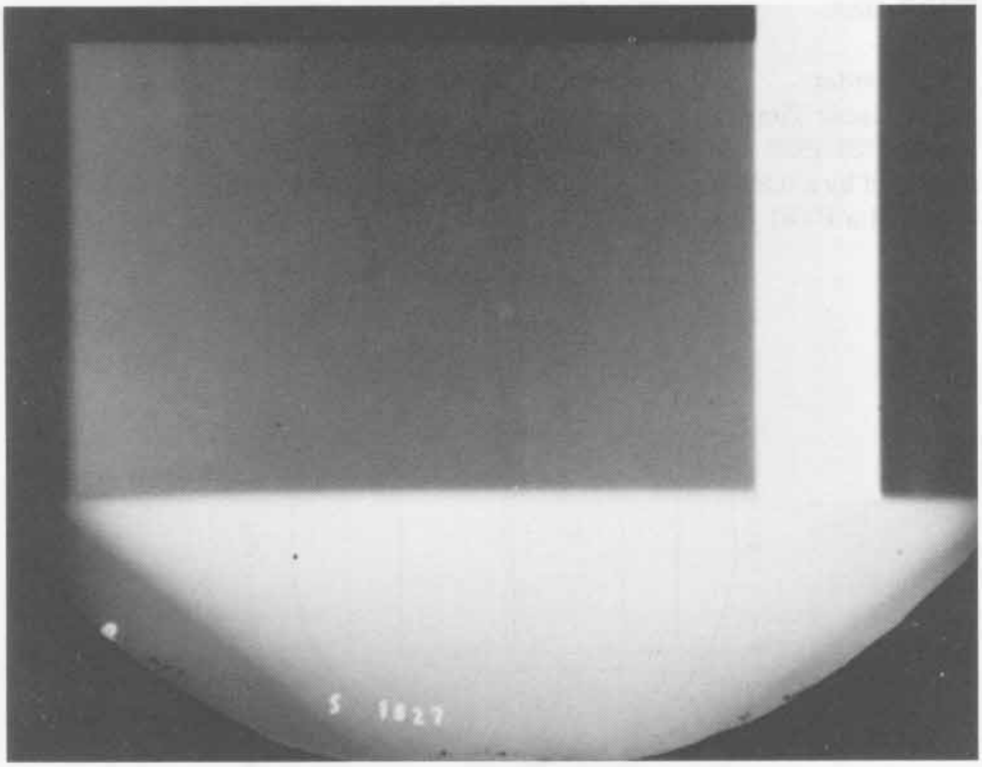

5 1026

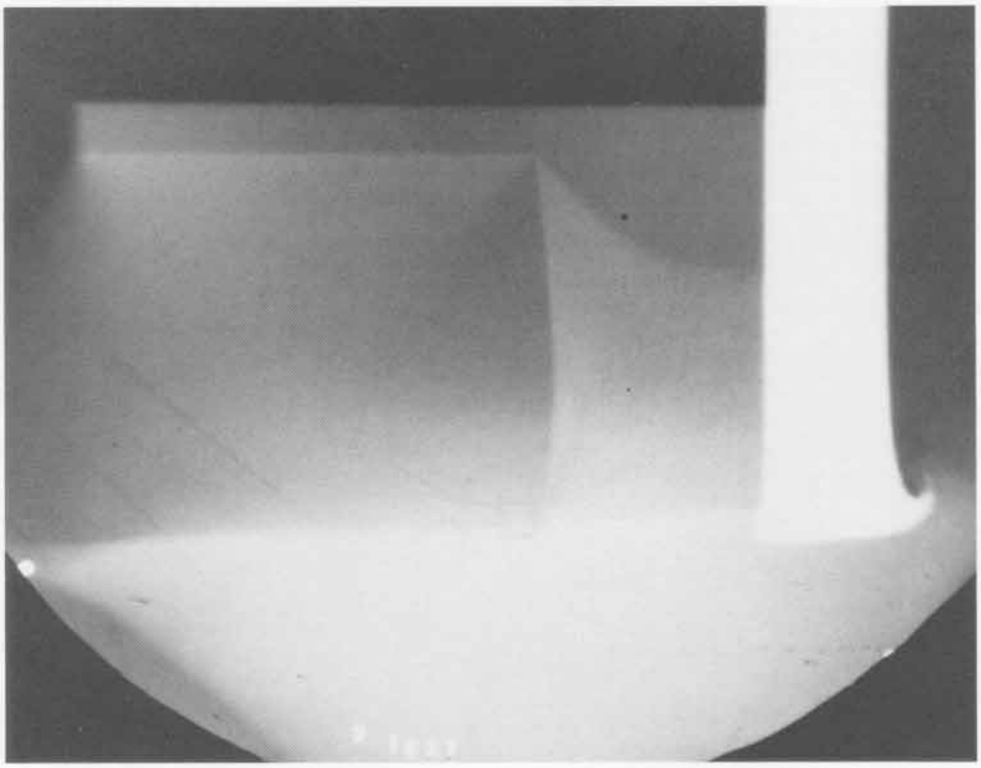


SHOT 1027:	**TNT Shocking Nitroguanidine Obliquely**
Date:	February 26, 1969
Experimenter:	Douglas Venable
Radiographic Time:	35.7 μs

To examine how a TNT detonation interacted with X0228 (95/5 wt% nitroguanidine and Estane at 1.686 g/cm³) in oblique geometry, both explosives were shocked by a P-081 lens. See Shots 1023, 1024, and 1025.

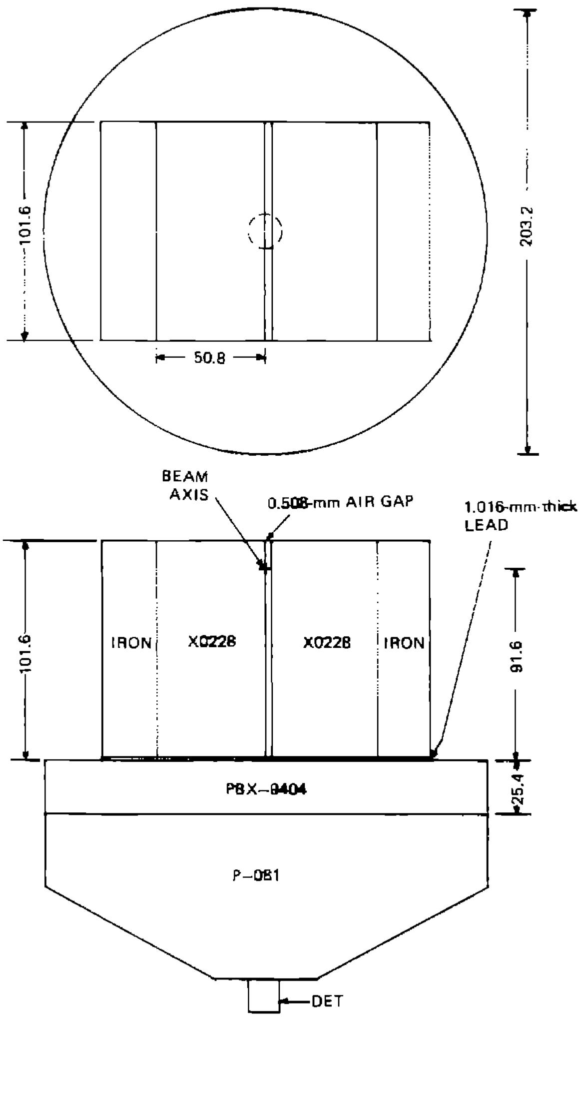


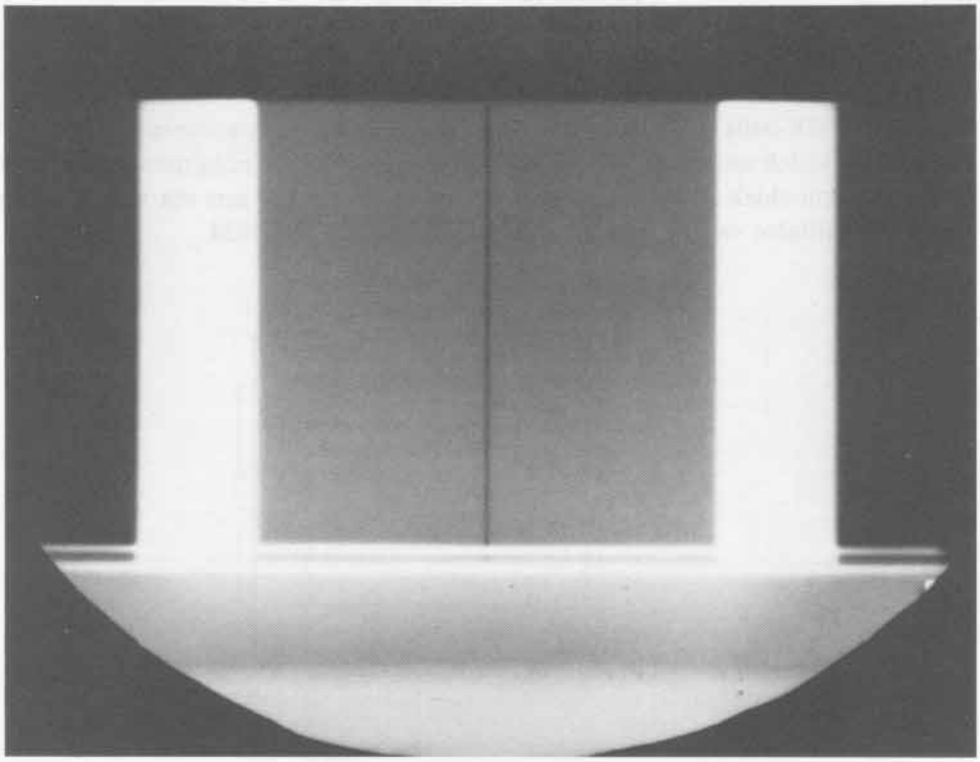


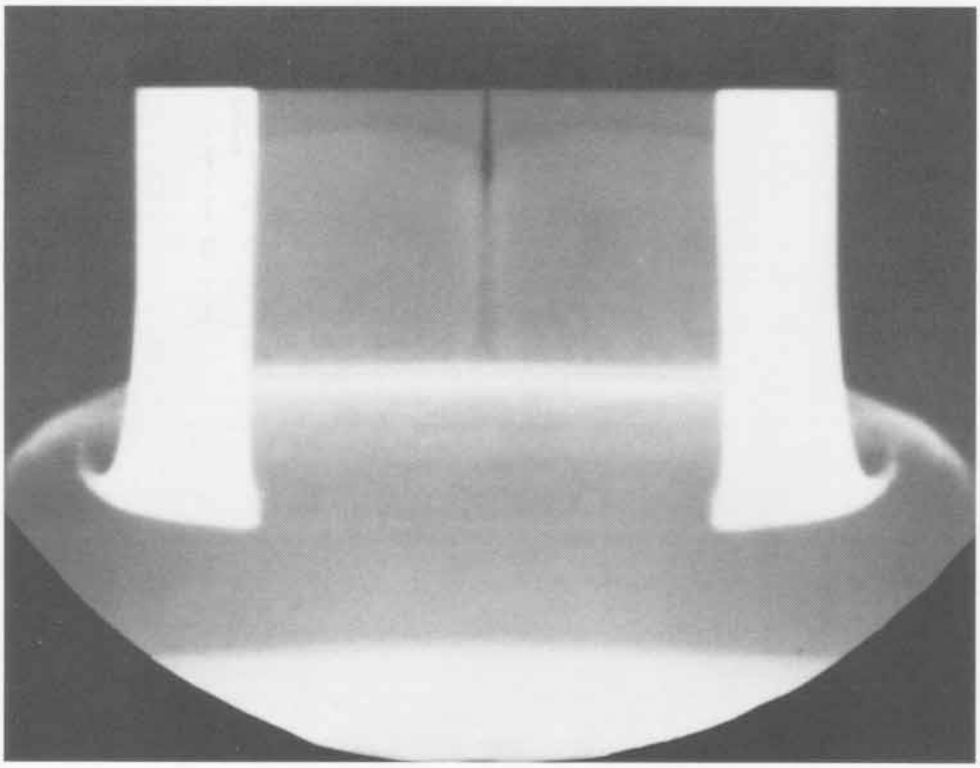


SHOT 1028: **Two Adjacent Nitroguanidine Detonations**
Date: April 22, 1969
Experimenter: William C. Davis
Radiographic Time: 36.54 μs

Two X0228 (95/5 nitroguanidine and Estane at 1.702 g/cm³) detonations were separated by a 0.508-mm air gap. The charges were initiated by 25.4 mm of PBX-9404 and a P-081 lens.

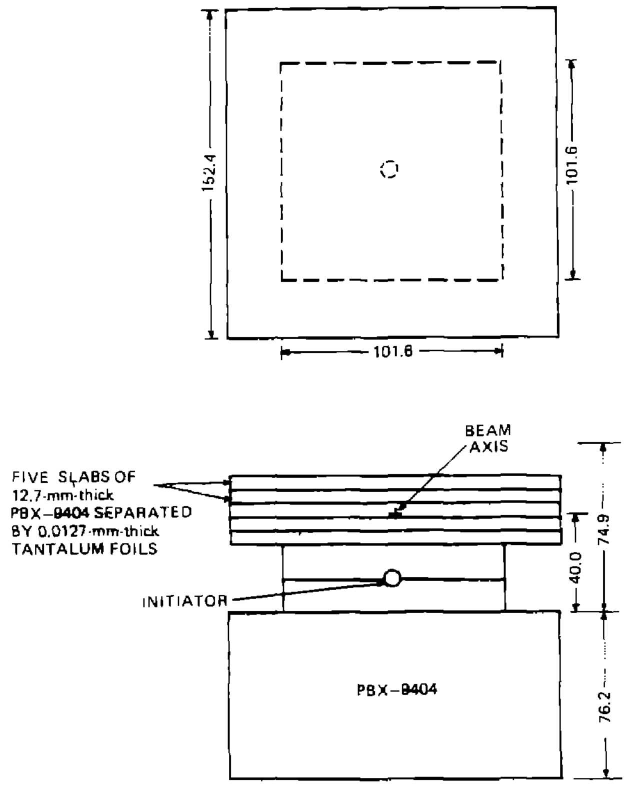


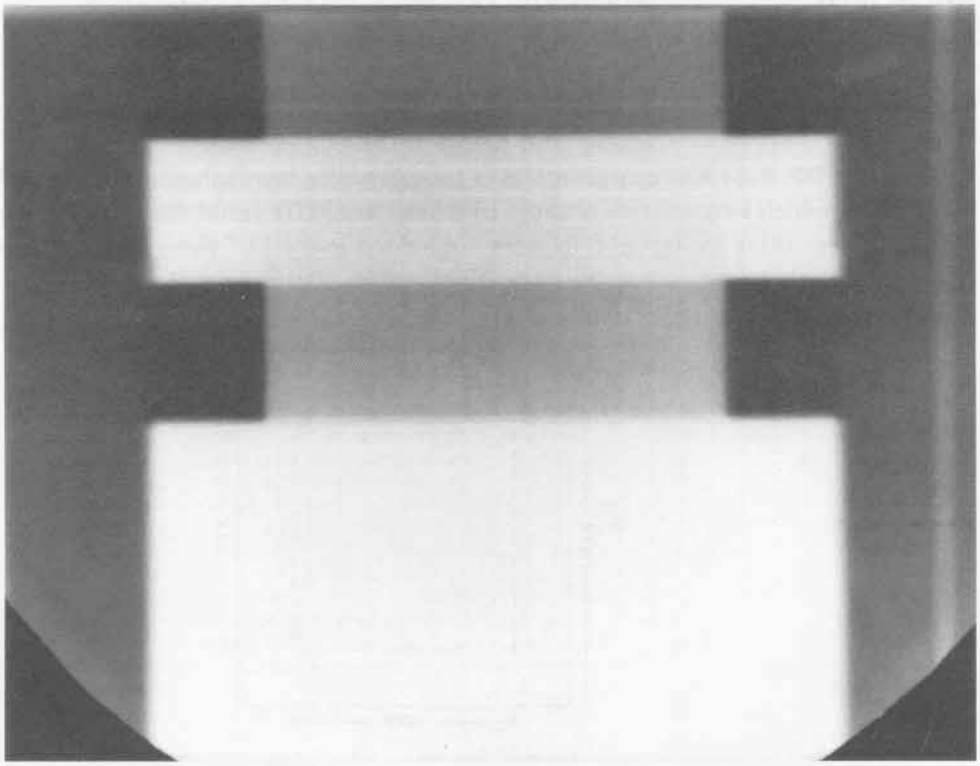


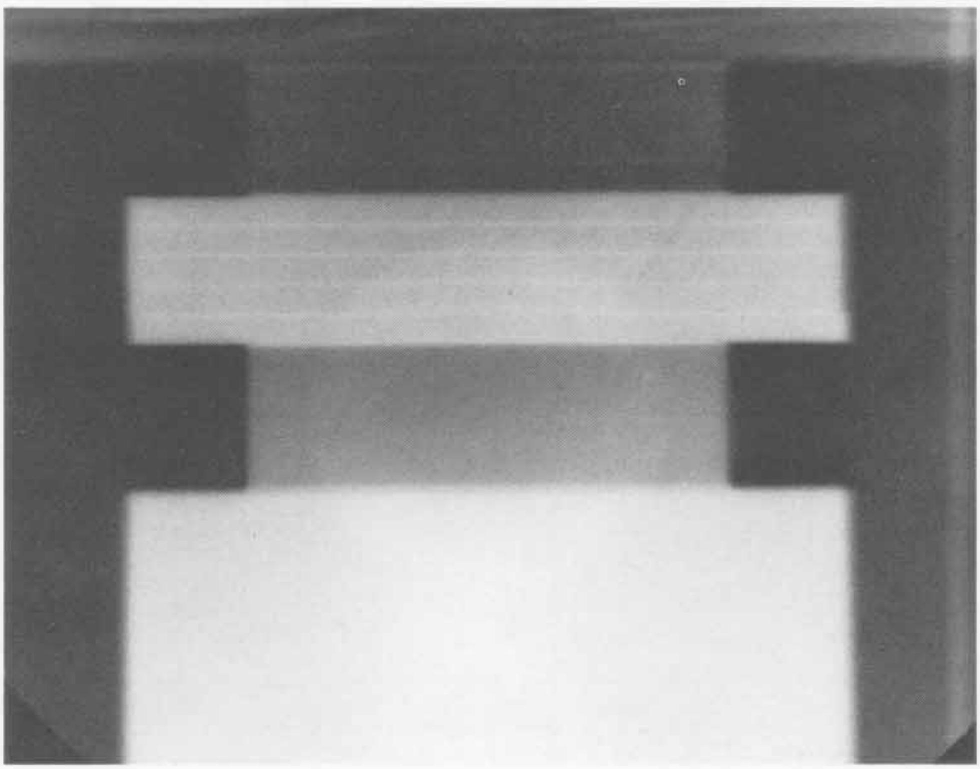


SHOT 1031: **Spherically Diverging PBX-9404 Detonation**
Date: September 4, 1969
Experimenter: Douglas Venable
Radiographic Time: 23.44 μs

A block of PBX-9404 was center-initiated by composite hemispheres of PBX-9407 and PETN, which were center-initiated by a length of MDF (mild detonating fuse). Five 0.0127-cm-thick tantalum foils are embedded every 12.7 mm starting 15.24 cm above the initiator center. See also Shots 1020, 1033, and 1034.

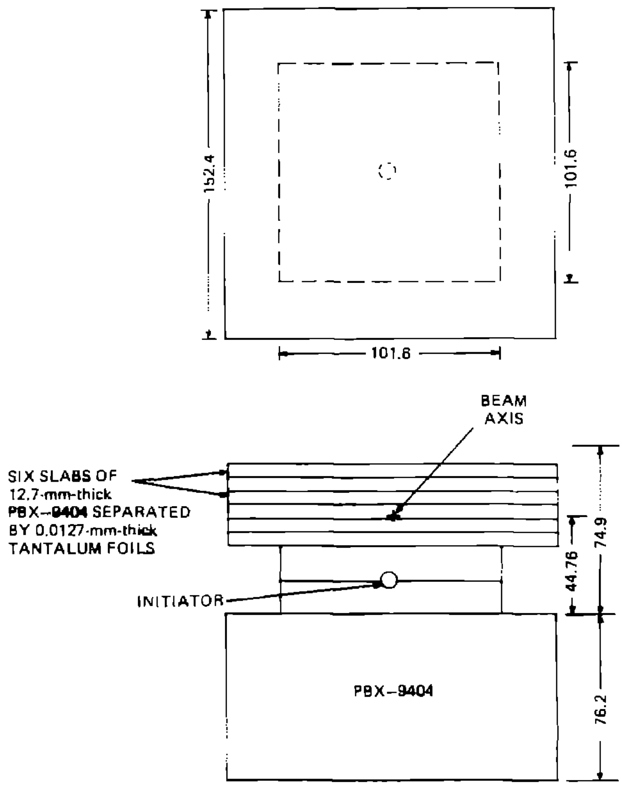


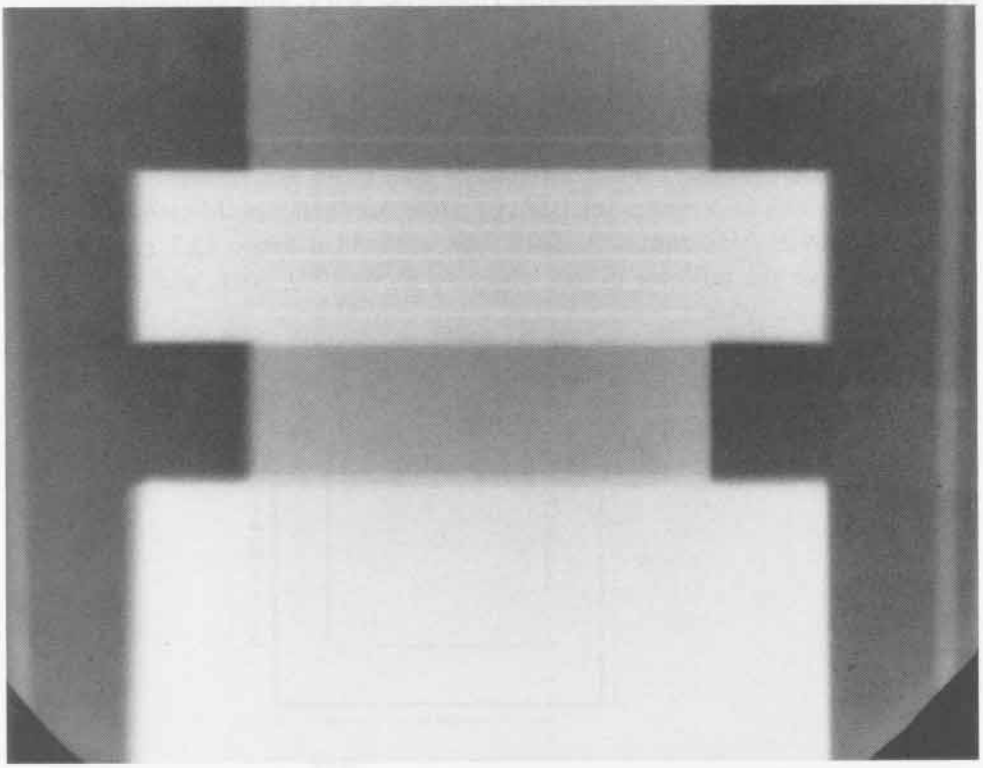


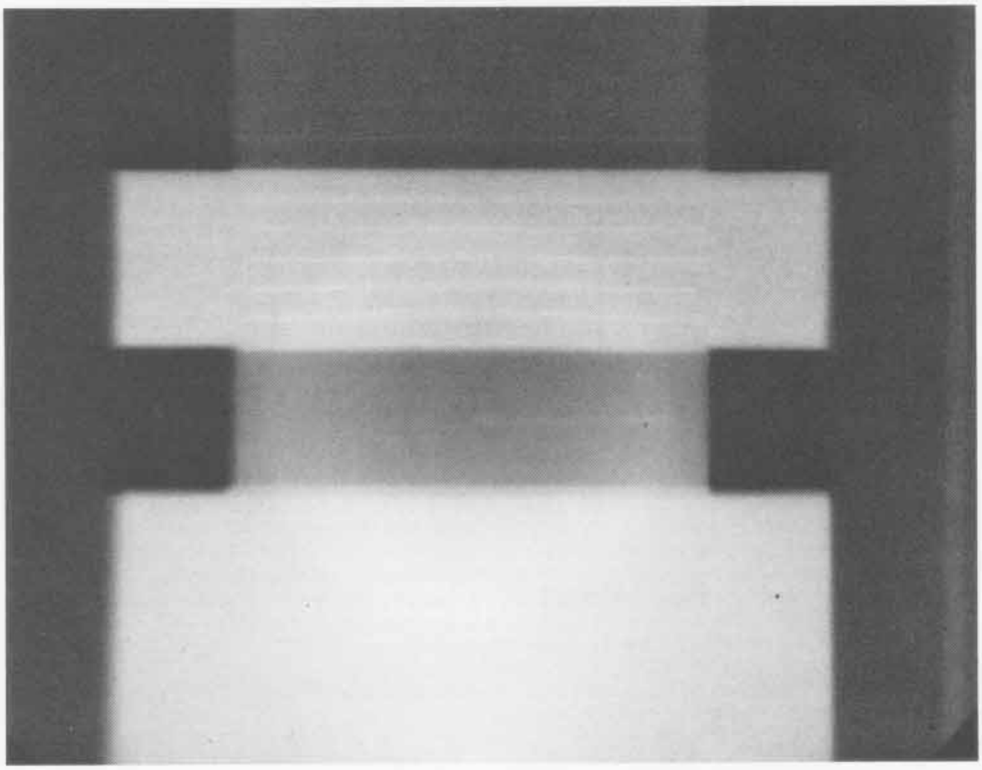


SHOT 1033: **Spherically Diverging PBX-9404 Detonation**
Date: August 27, 1970
Experimenter: Douglas Venable
Radiographic Time: 24.09 μs
References: Mader and Craig, 1975; Mader, 1979

A block of PBX-9404 was center-initiated by composite hemispheres of PBX-9407 and PETN, which were center-initiated by a length of MDF (mild detonating fuse). Six 0.0127-cm-thick tantalum foils were embedded every 12.7 mm, starting 15.24 cm above the initiator center. See also Shots 1020, 1031, and 1034.

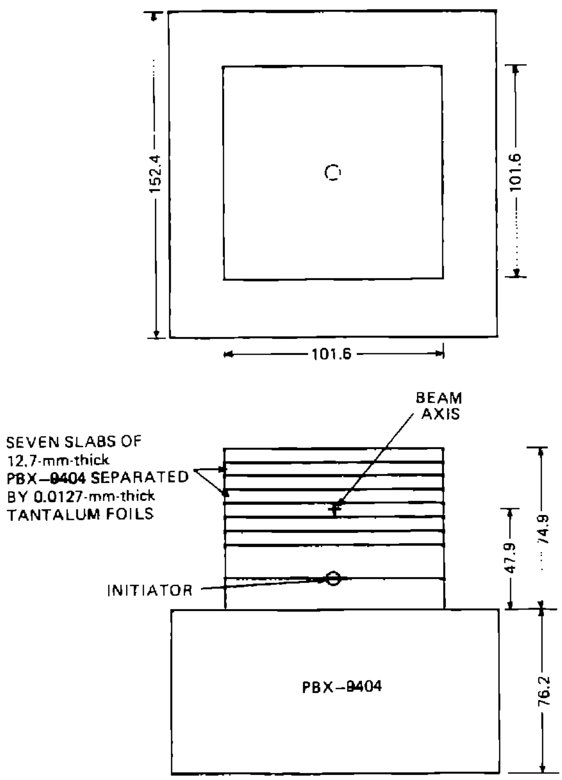


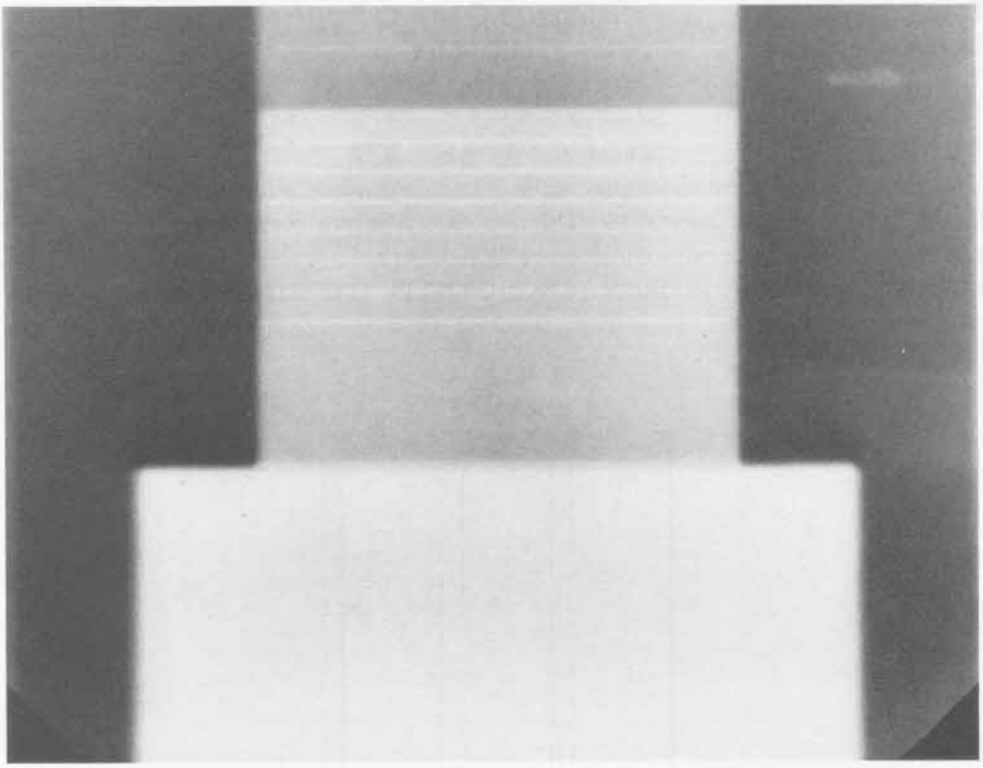


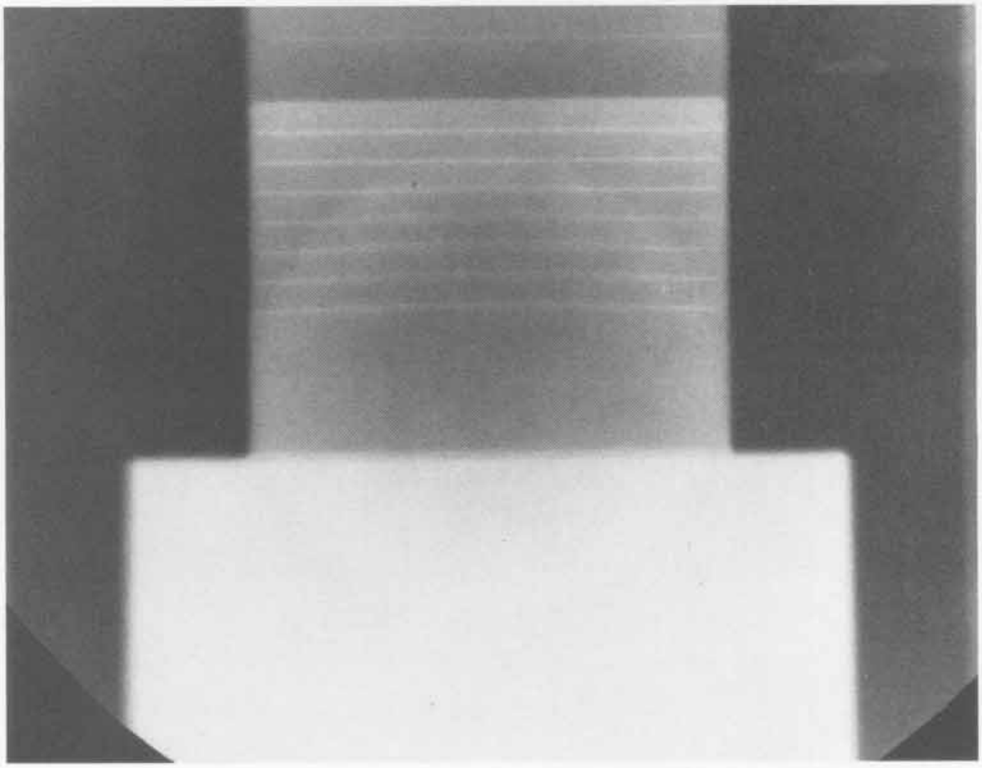


SHOT 1034: **Spherically Diverging PBX-9404 Detonation**
Date: September 17, 1970
Experimenter: Douglas Venable
Radiographic Time: 24.75 μs
References: Mader and Craig, 1975; Mader, 1979

A block of PBX-9404 was center-initiated by composite hemispheres of PBX-9407 and PETN, which were center-initiated by a length of MDF (mild detonating fuse). Seven 0.0127-cm-thick tantalum foils were embedded every 12.7 mm, starting 15.24 cm above the initiator center. See also Shots 1020, 1031, and 1033.

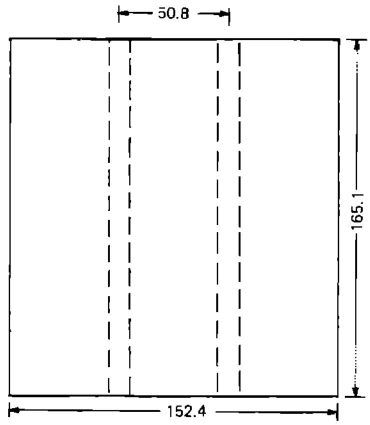


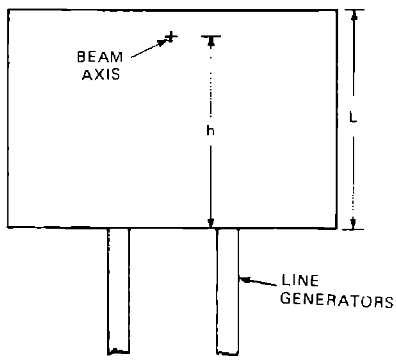


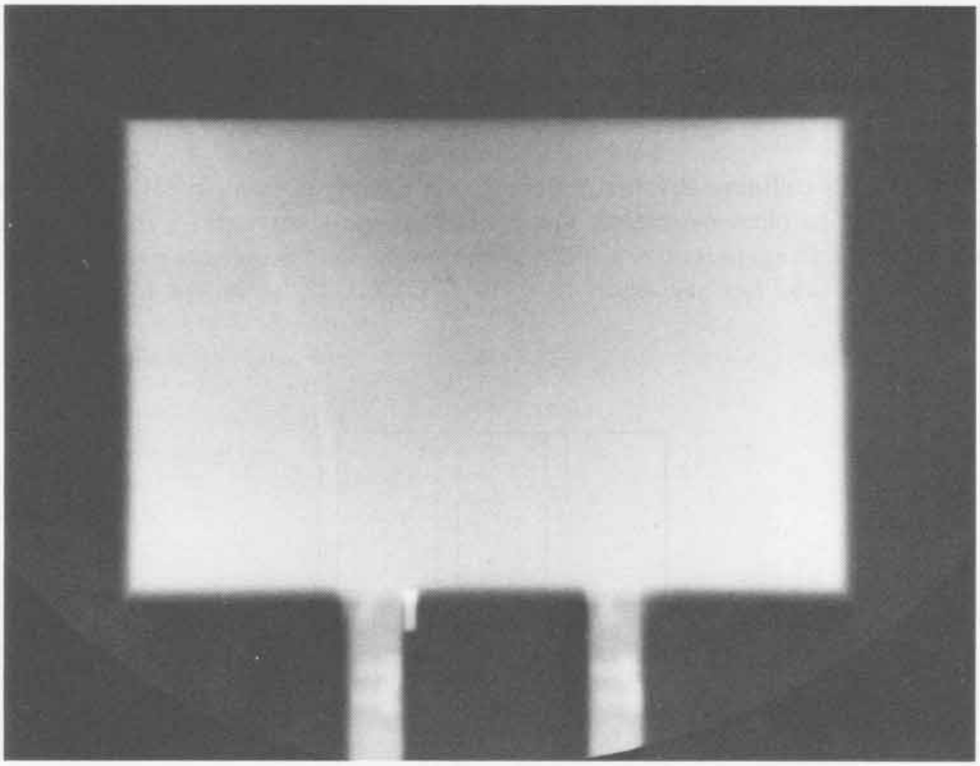


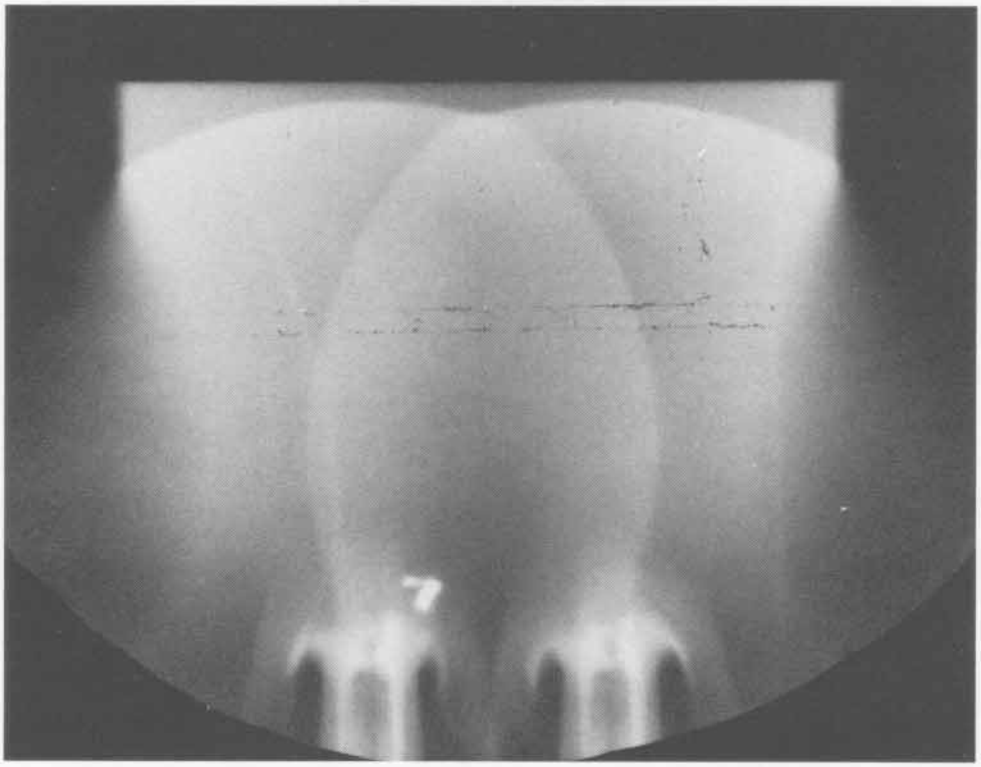
SHOT 1037: **Colliding PBX-9404 Cylindrical Detonation Waves**
Date: August 5, 1969
Experimenter: Douglas Venable
Radiographic Time: 32.46 μs
Reference: Mader and Venable, 1979

Two laterally colliding, diverging, cylindrical detonation waves in PBX-9404 were initiated by two line generators. The detonation waves traveled for 11.16 μs after arrival of the line generator shock wave. The length, L, of the charge was 101.6 mm. h was 95.2 mm. See also Shots 1019, 1038, 1130, 1143, 1159, and 1160.



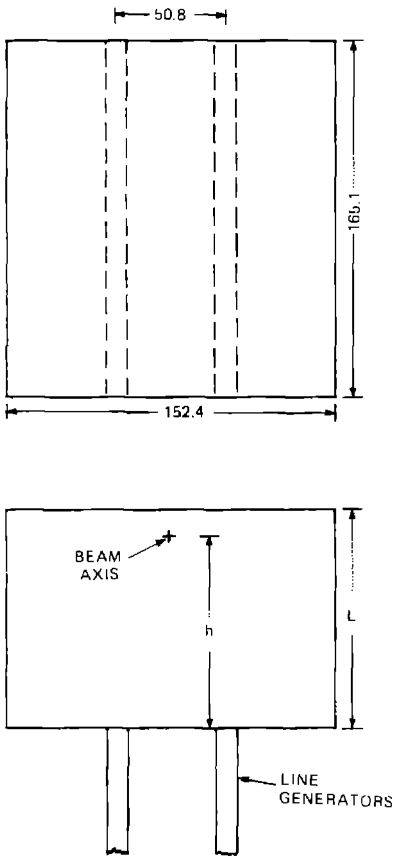


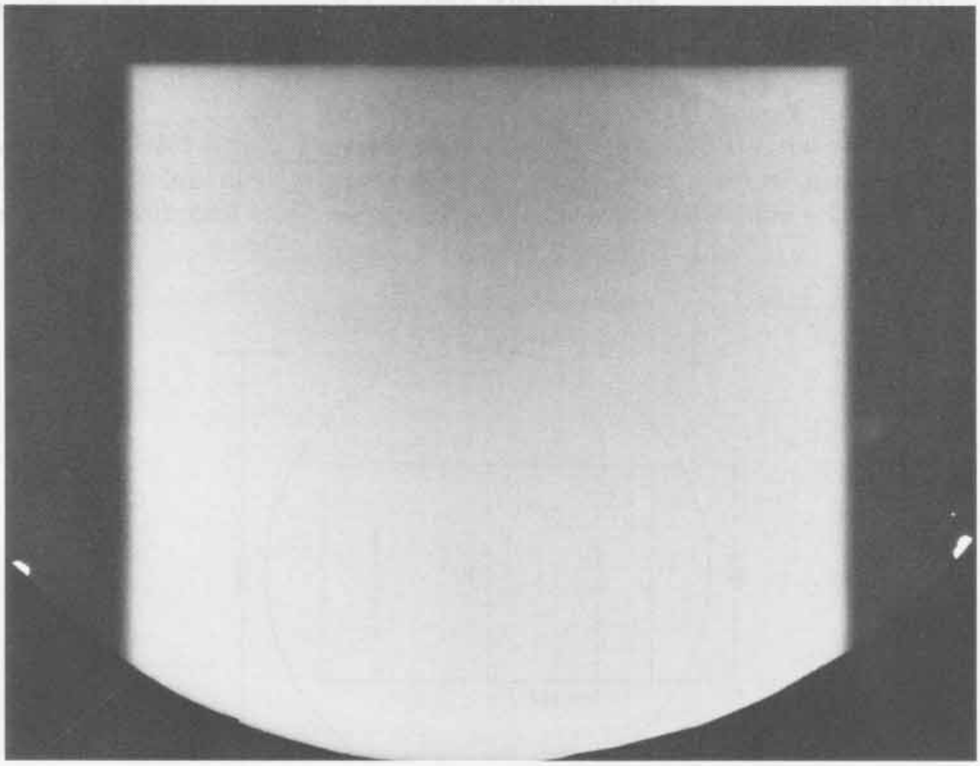


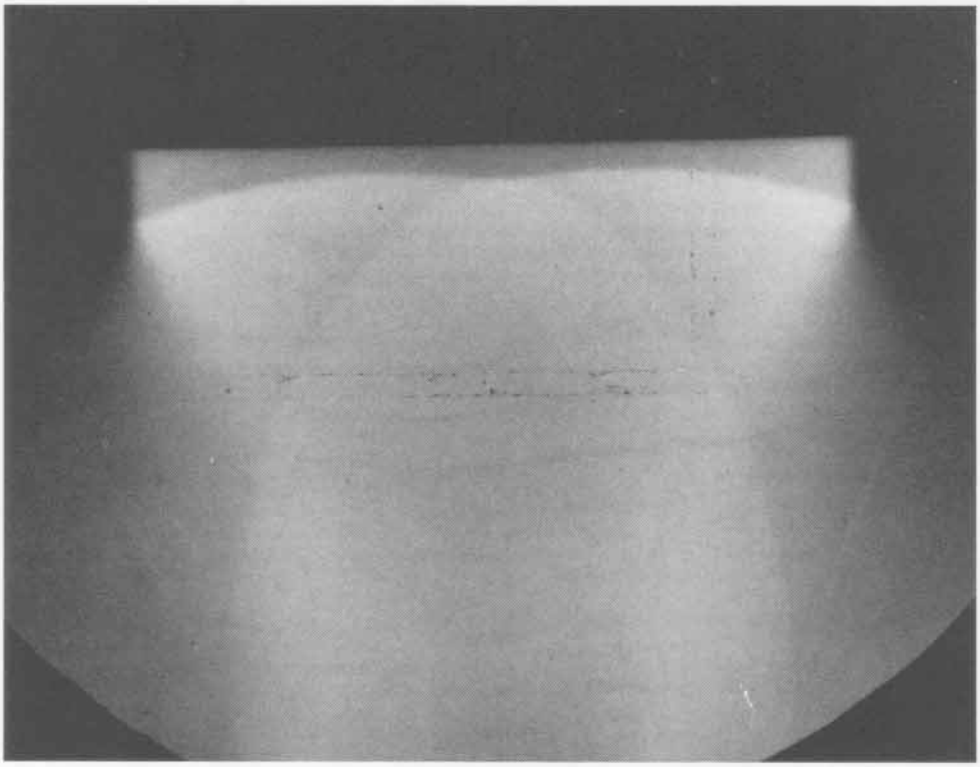


SHOT 1038: **Colliding PBX-9404 Cylindrical Detonation Waves**
Date: August 26, 1969
Experimenter: Douglas Venable
Radiographic Time: 38.05 μs
Reference: Mader and Venable, 1979

Two laterally colliding, diverging, cylindrical detonation waves in PBX-9404 were initiated by two line generators. The detonation waves traveled for 16.75 μs after arrival of the line generator shock wave. The length, L, of the charge was 152.4 mm. h was 146.0 mm. See also Shots 1019, 1037, 1130, 1143, 1159, and 1160.

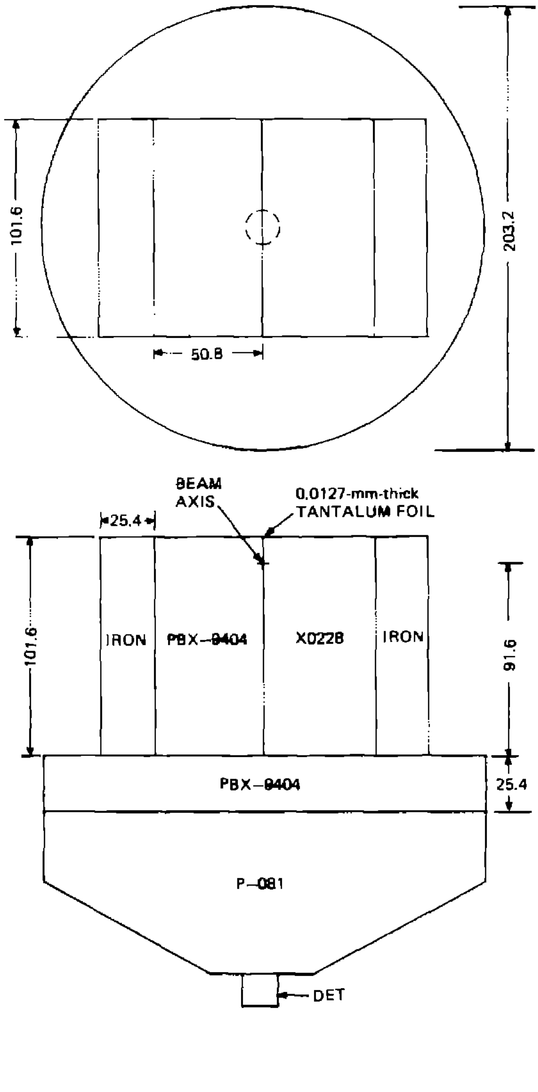


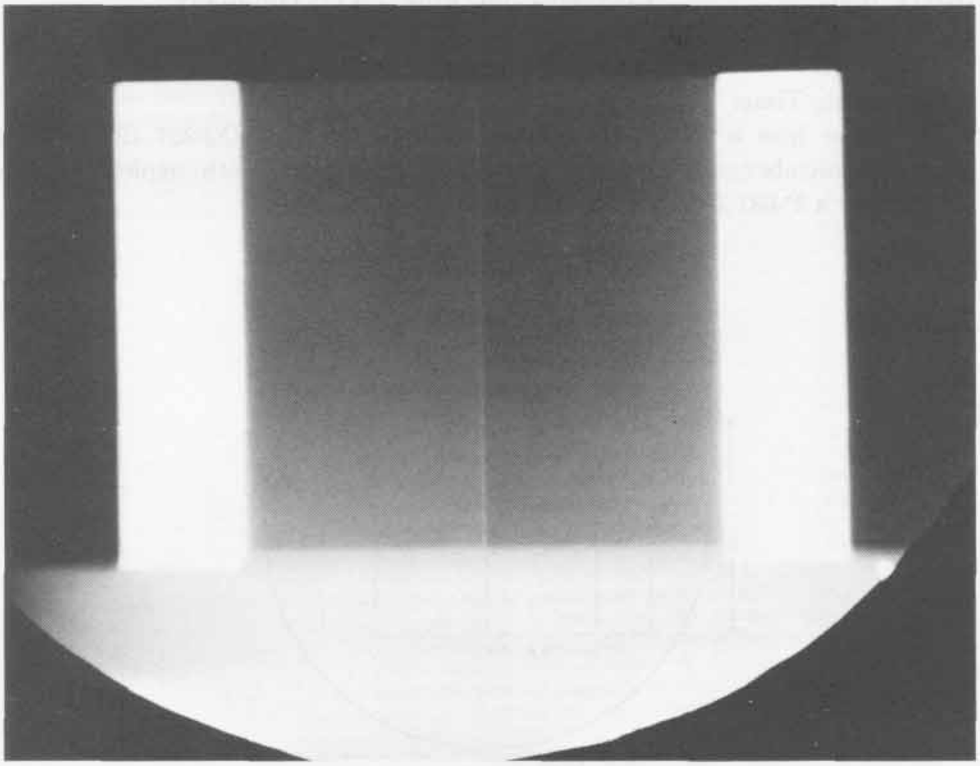


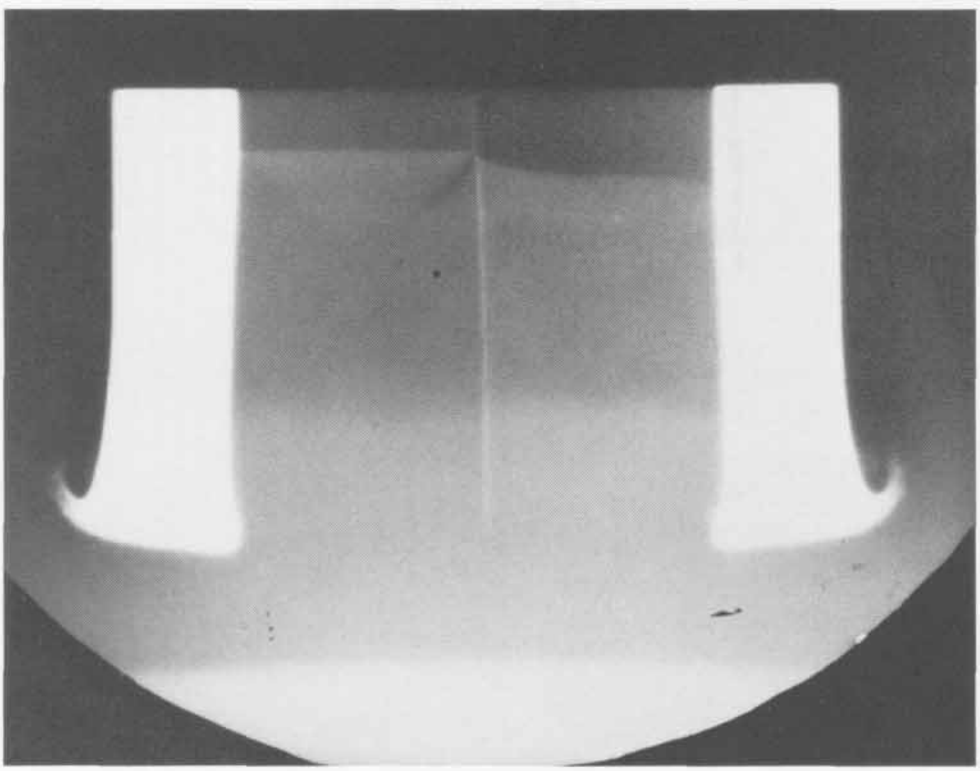


SHOT 1046: **Oblique PBX-9404 and Nitroguanidine Detonations**
Date: February 18, 1969
Experimenter: Douglas Venable
Radiographic Time: 35.55 μs

To examine how a PBX-9404 detonation interacts with X0228 (95/5 wt% nitroguanidine and Estane at 1.686 g/cm^3) in oblique geometry, both explosives were initiated by 25.4 mm of PBX-9404 and a P-081 lens. See Shots 1023, 1024, 1025, and 1027.

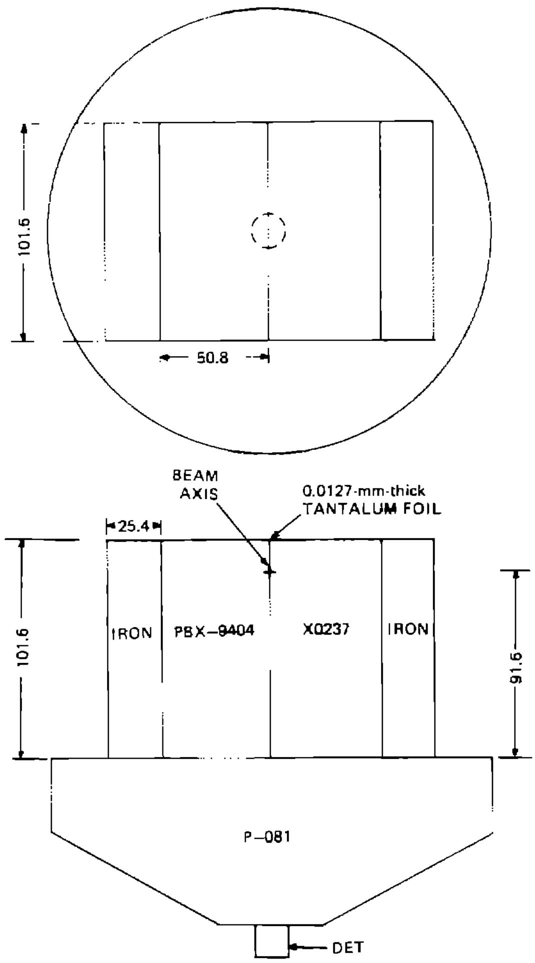


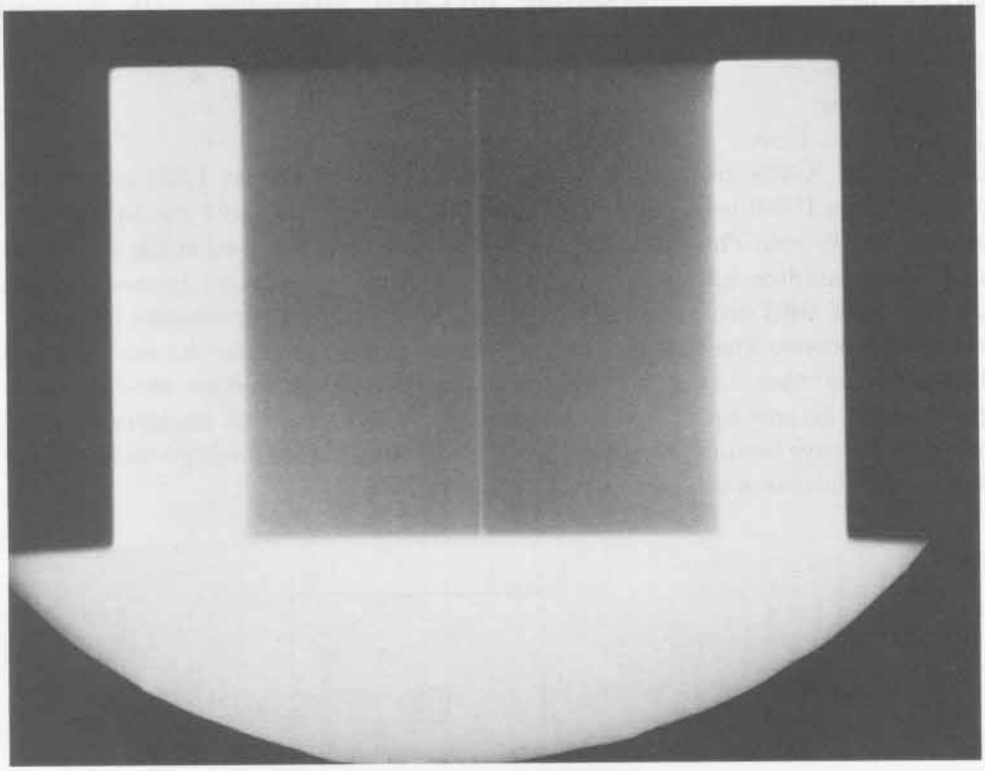


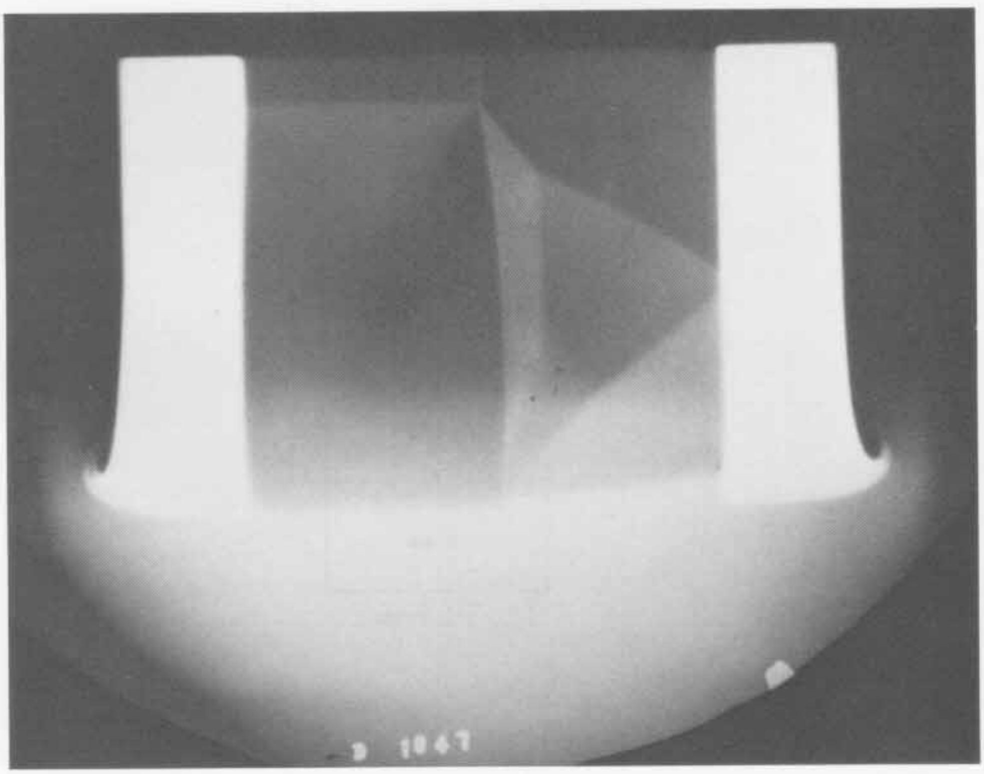


SHOT 1047: **PBX-9404 Shocking TATB Obliquely**
Date: January 30, 1969
Experimenter: Douglas Venable
Radiographic Time: 33.0 μs

To examine how a PBX-9404 detonation interacts with X0237 (90/5/5 wt% triaminotrinitrobenzene/B[2] wax/Elvax at 1.740 g/cm[3]), both explosives were shocked by a P-081 lens.







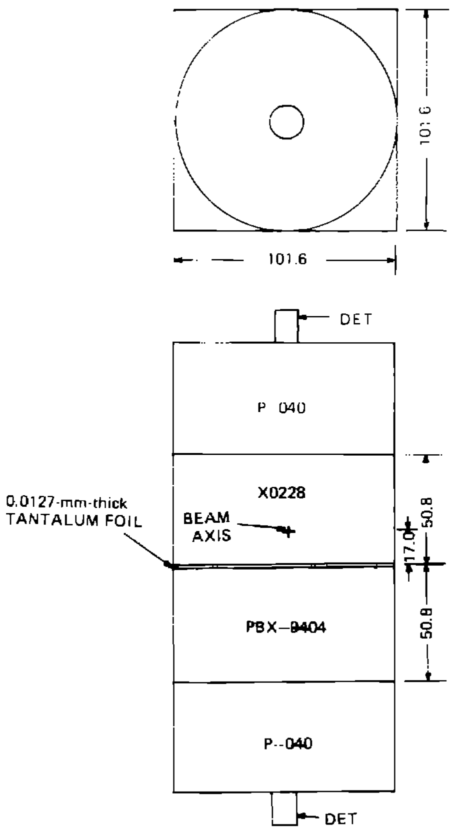
SHOT 1049: **Detonating PBX-9404 Interacting with Shocked Nitroguanidine**

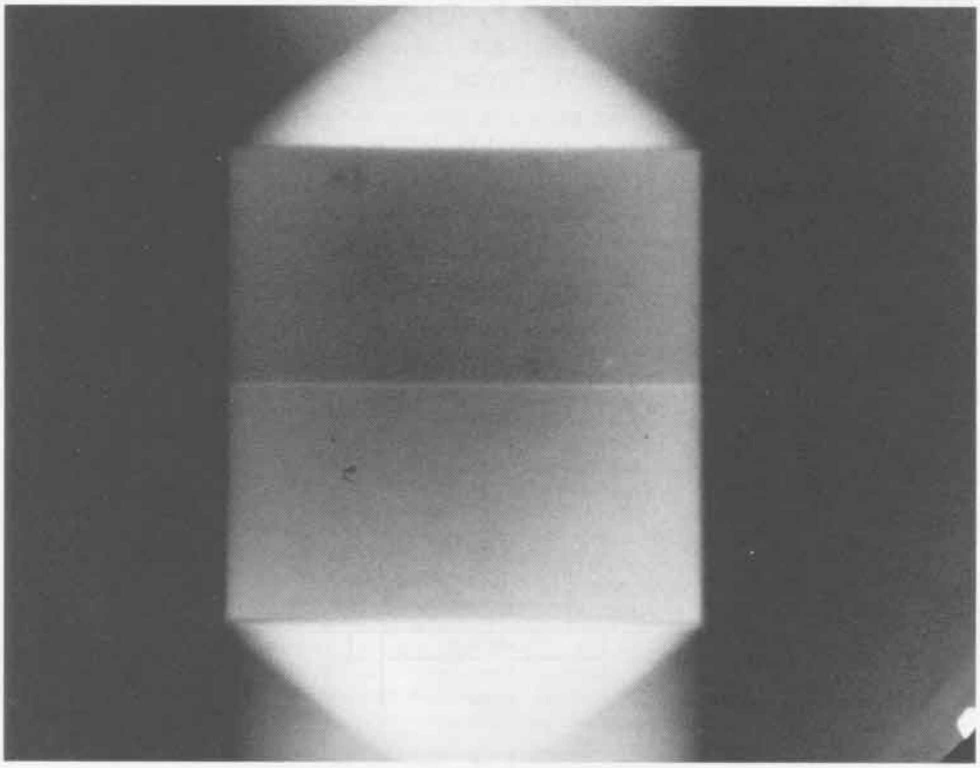
Date: February 18, 1969

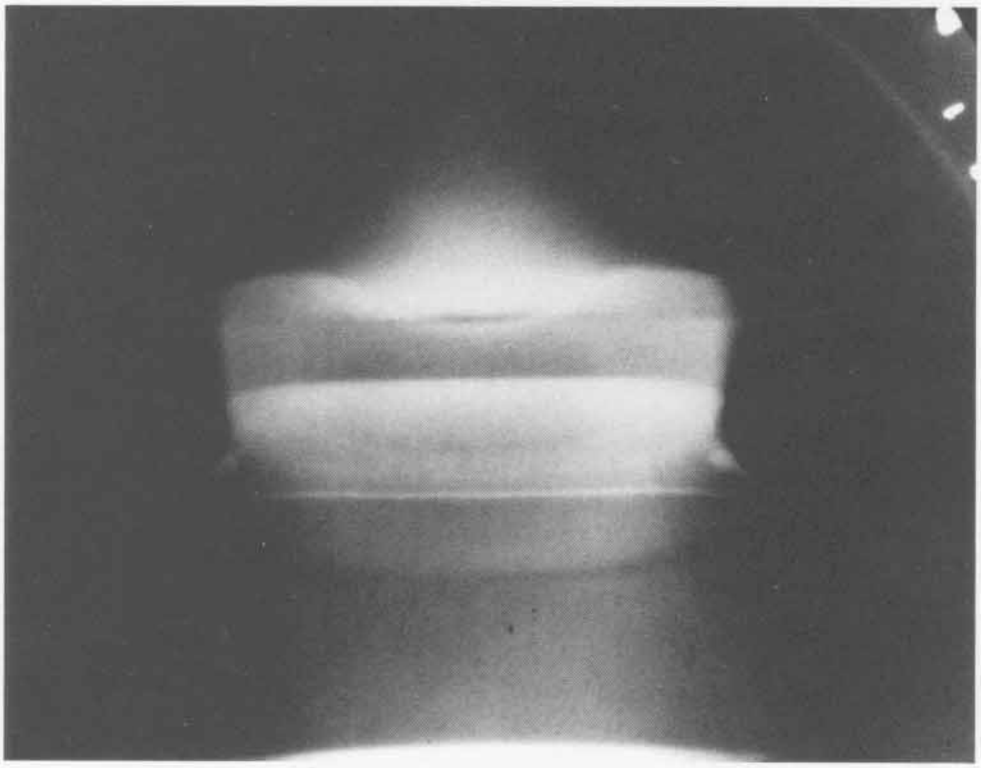
Experimenter: William C. Davis

Radiographic Time: 26.57 μs

50.8 mm of X0228 (95/5 wt% nitroguanidine and Estane at 1.683 g/cm³) was shocked by a P-040 lens, and 4.0 μs later 50.8 mm of PBX-9404 was initiated by another P-040 lens. The detonation wave and shock wave arrived at the PBX-9404 and nitroguanidine interface simultaneously. A reflected shock proceeded back into the PBX-9404 detonation products and the shocked nitroguanidine after collision of the waves. The best agreement with the radiographic results was obtained by assuming that the reflected shock in the nitroguanidine resulted in a propagating detonation in the shocked nitroguanidine; however, the interpretation was inconclusive because almost as good agreement was obtained by assuming that the nitroguanidine was desensitized by the preshocking.







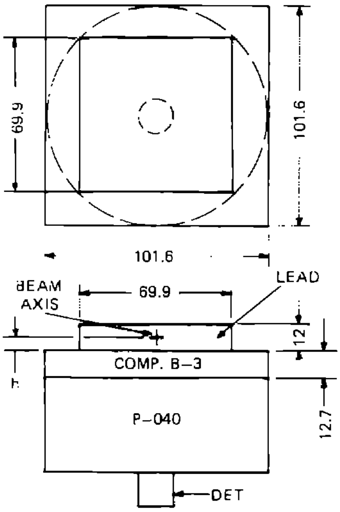
SHOT 1051: **Lead Back Surface**

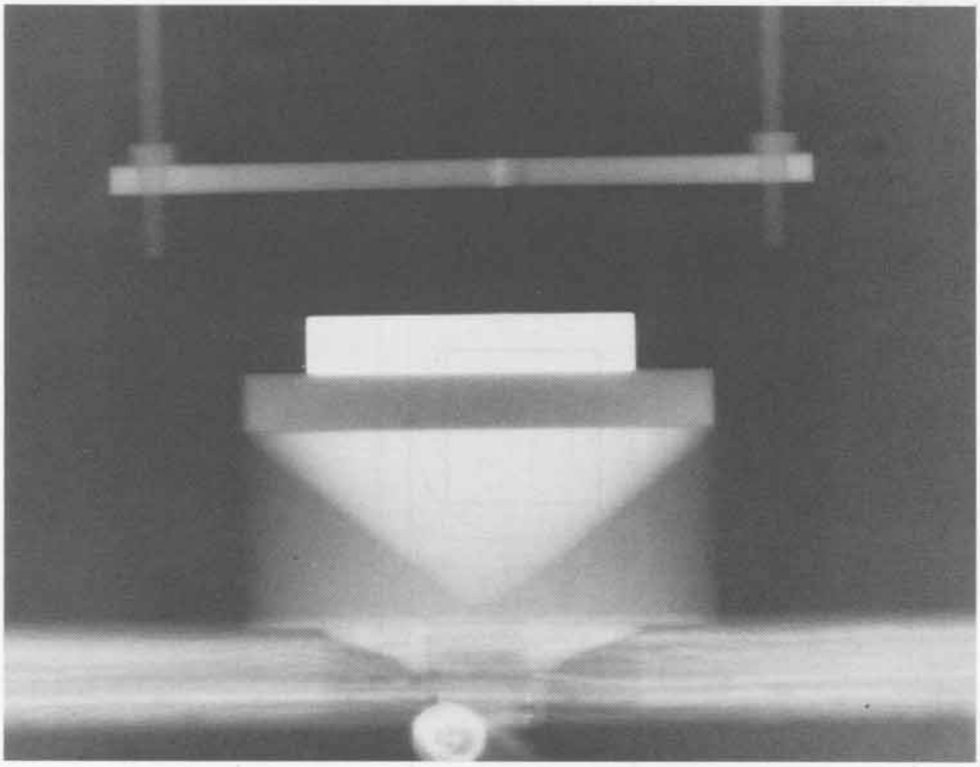
Date: March 25, 1969

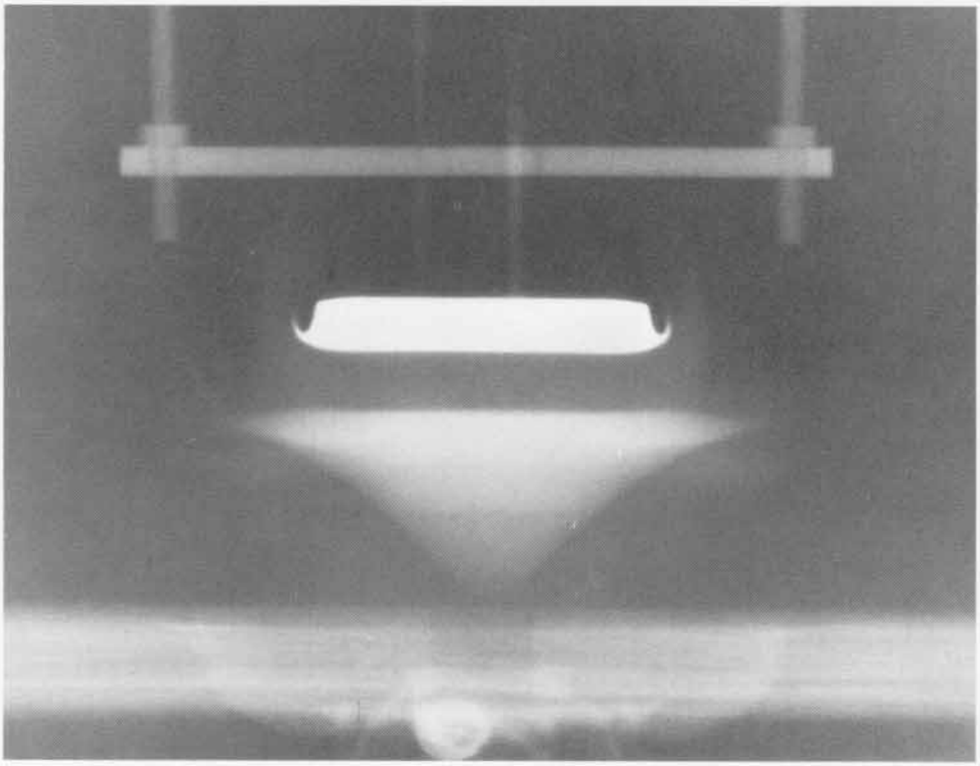
Experimenter: Roger W. Taylor

Radiographic Time: 20.13 μs

A 12.0-mm-thick lead plate was shocked by 12.7 mm of Composition B-3 initiated by a P-040 lens. h was 2.59 mm. A reference bar is shown above the shot.

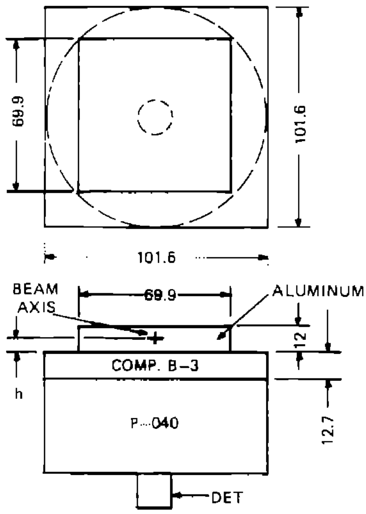


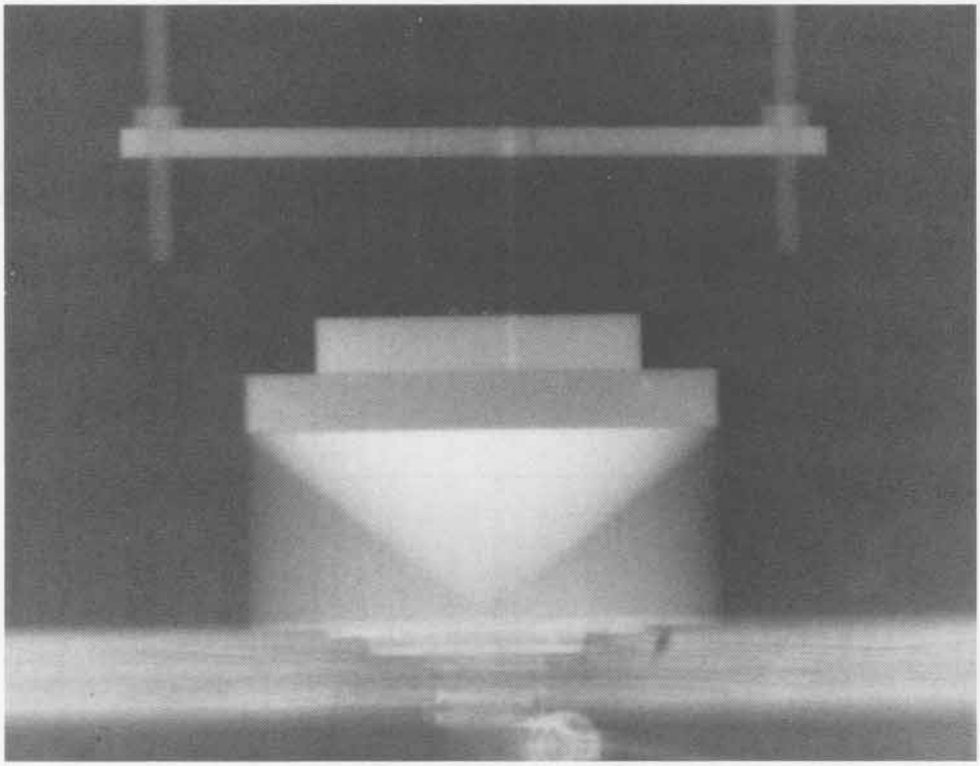


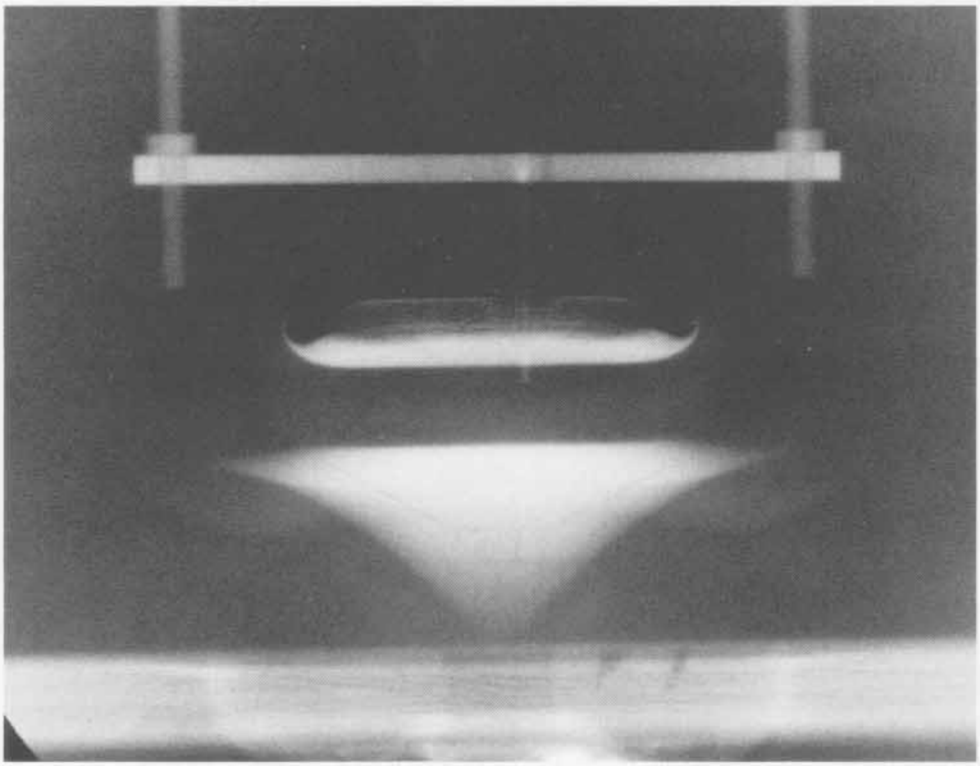


SHOT 1052: **Aluminum Back Surface**
Date: March 19, 1969
Experimenter: Roger W. Taylor
Radiographic Time: 21.16 μs

A 12.0-mm-thick aluminum plate was shocked by 12.7 mm of Composition B-3 initiated by a P-040 lens. h was 8.0 mm. This was a duplicate of Shot 546 with timing pins.

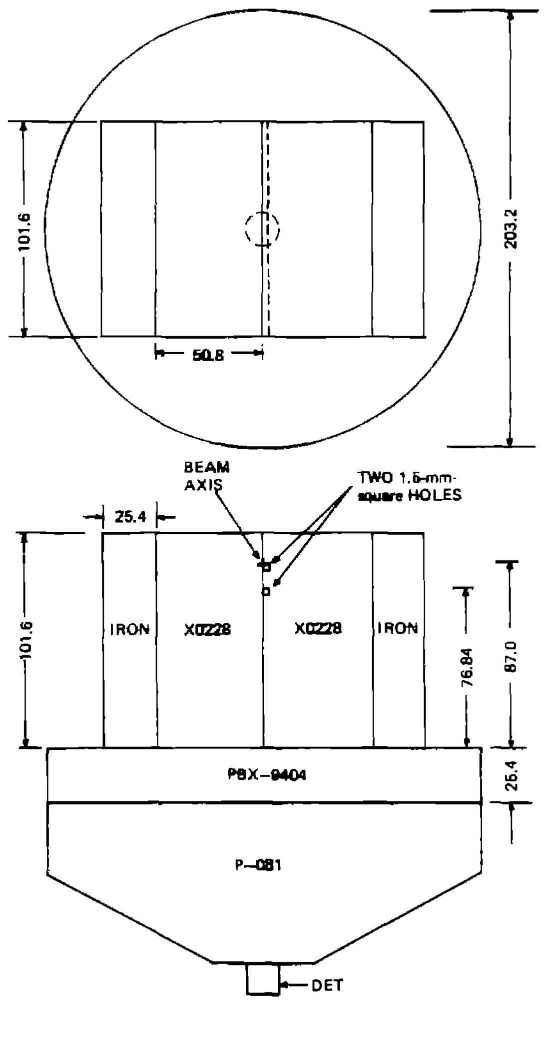


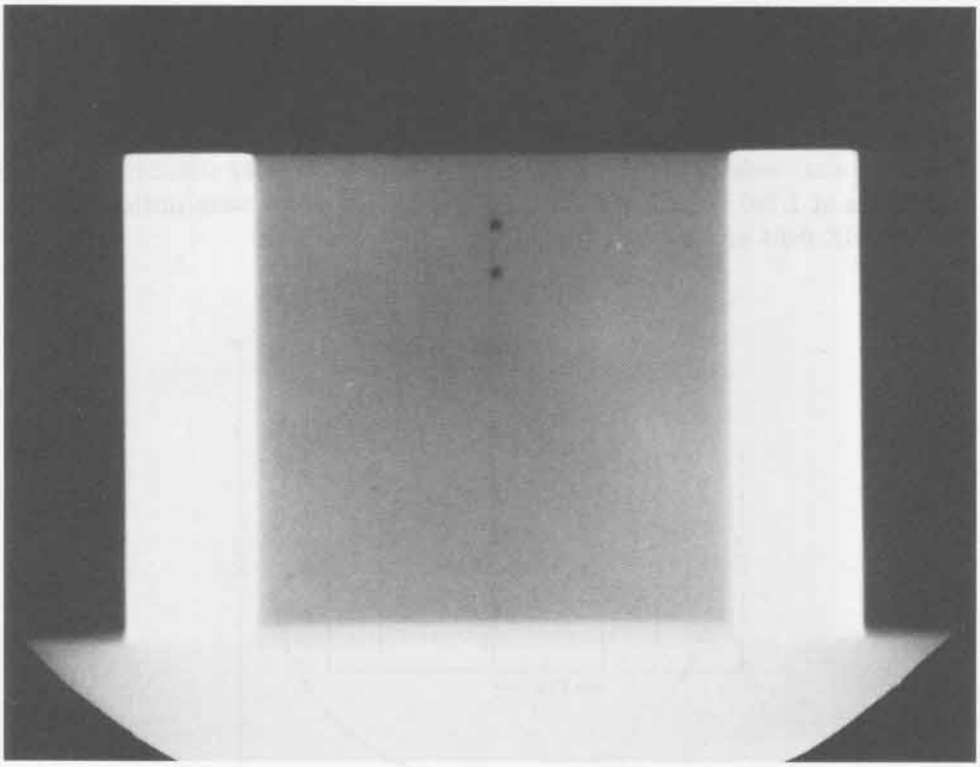


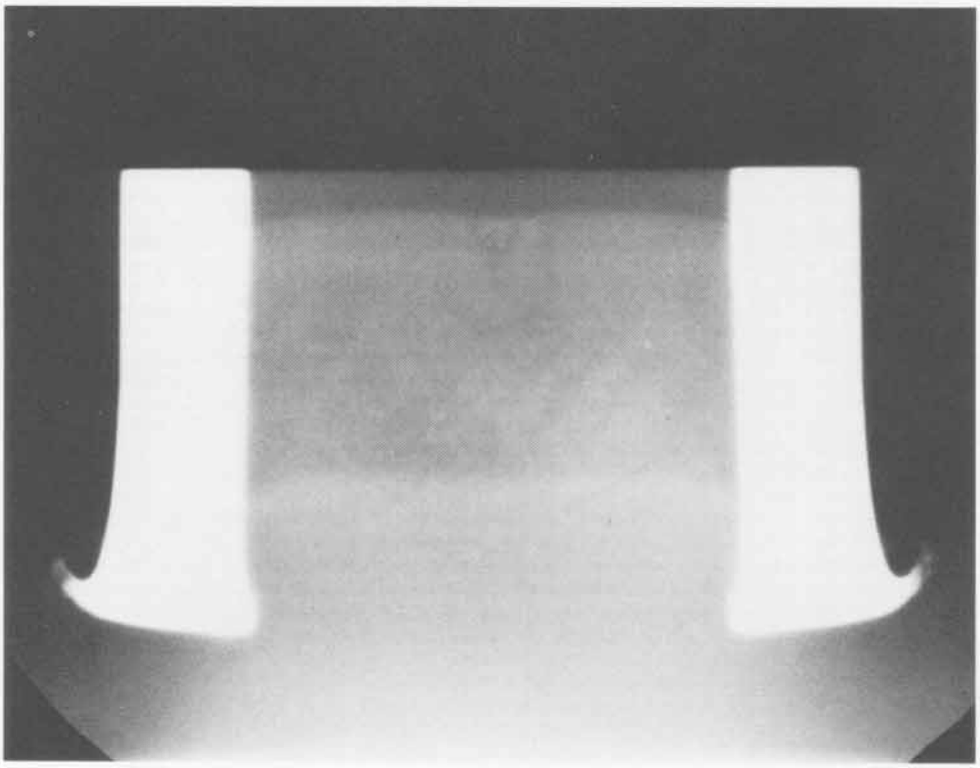


SHOT 1056: **Perturbation Waves in Nitroguanidine**
Date: April 2, 1969
Experimenter: William C. Davis
Radiographic Time: 36.55 μs

Two 50.8-mm-wide and 101.6-mm-high X0228 blocks (95/5 wt% nitroguanidine and Estane at 1.704 g/cm^3), with two 1.5-mm-square holes located 14.55 and 24.76 mm from the top of the charges, were initiated by 25.4 mm of PBX-9404 and a P-081 lens.

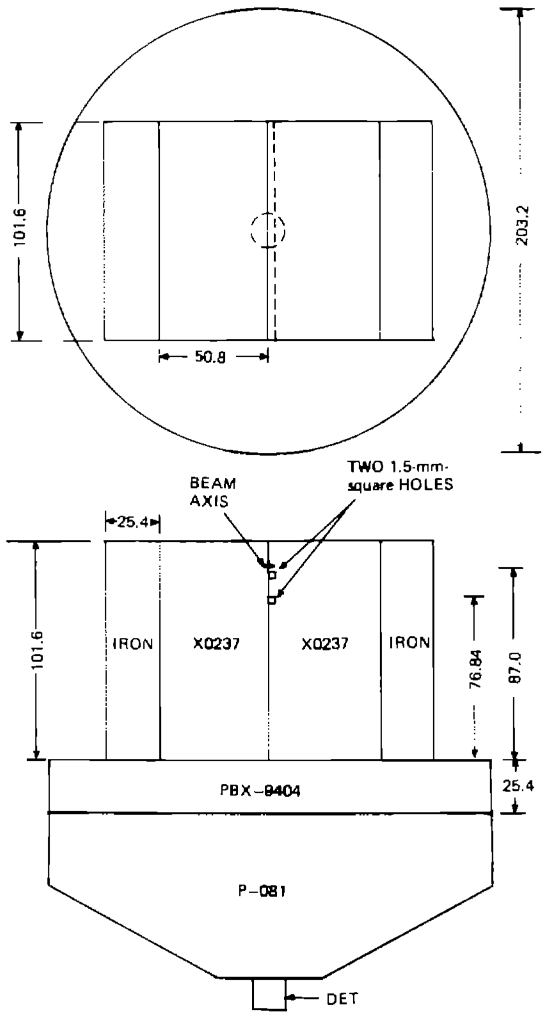


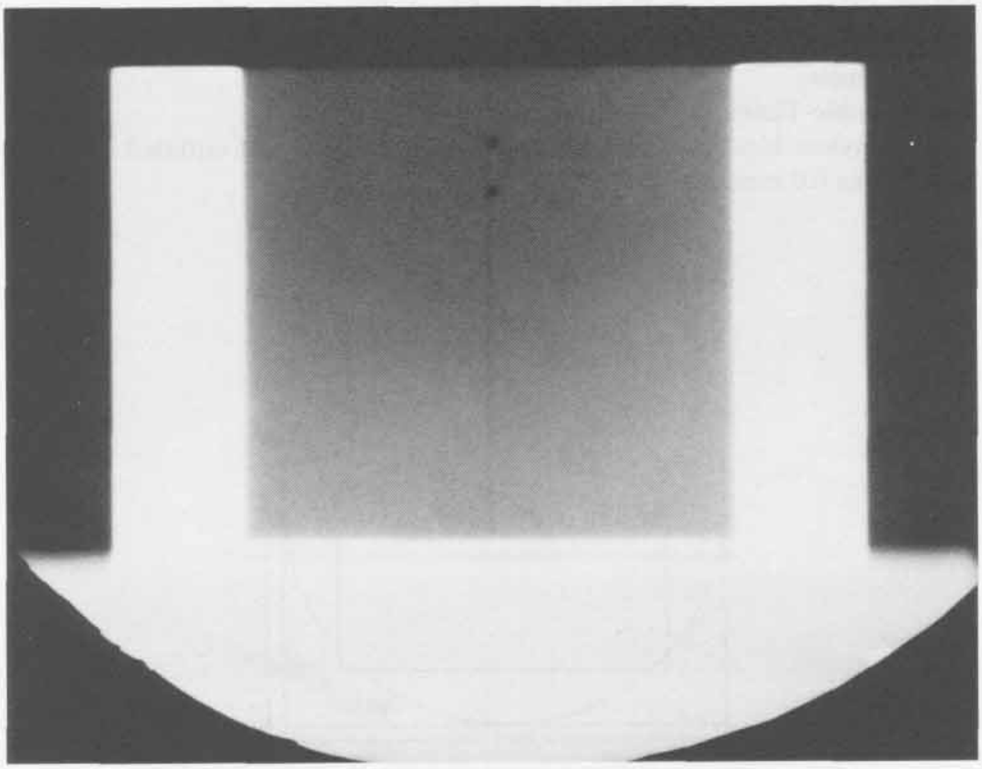


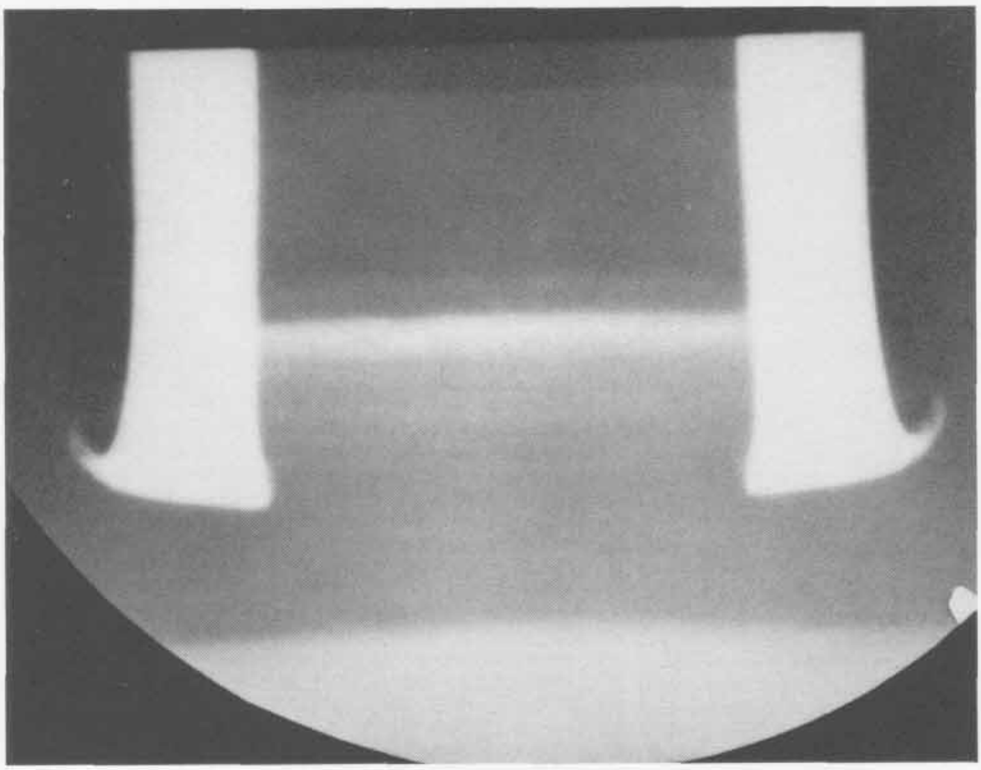


SHOT 1060: **Perturbation Waves in TATB**
Date: May 6, 1969
Experimenter: William C. Davis
Radiographic Time: 37.52 μs

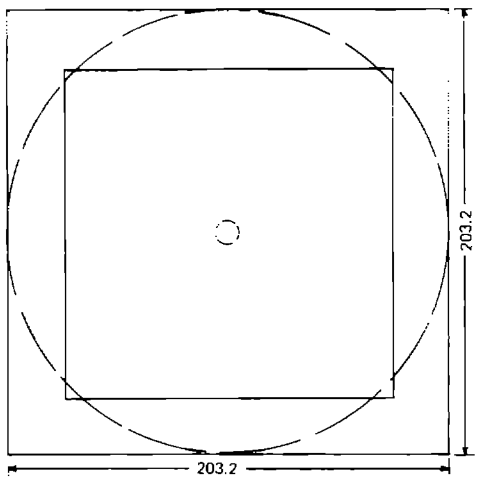
Two 50.8-mm-wide and 101.6-mm-high blocks of X0237 (90/5/5 TATB/B[2] wax/Elvax at 1.740 g/cm^3), with two 1.5-mm-square holes, were initiated by 25.4 mm of PBX-9404 and a P-081 lens.

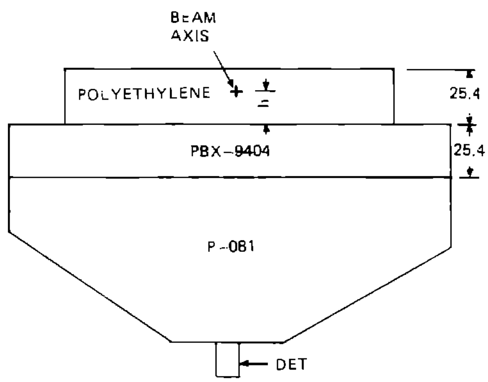


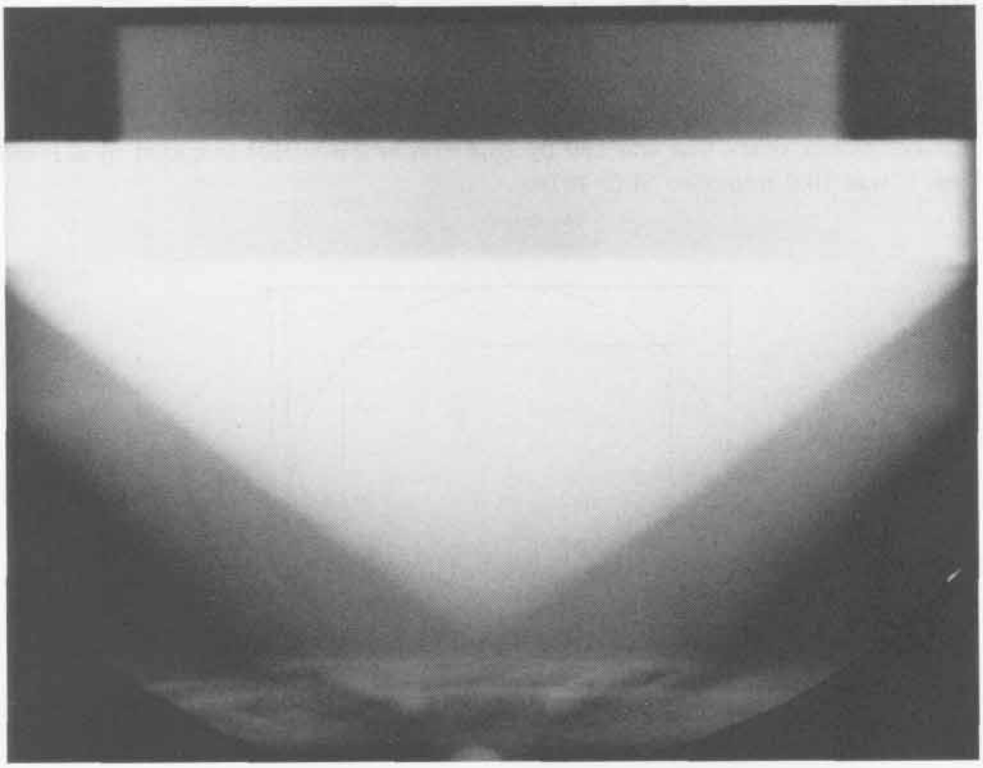


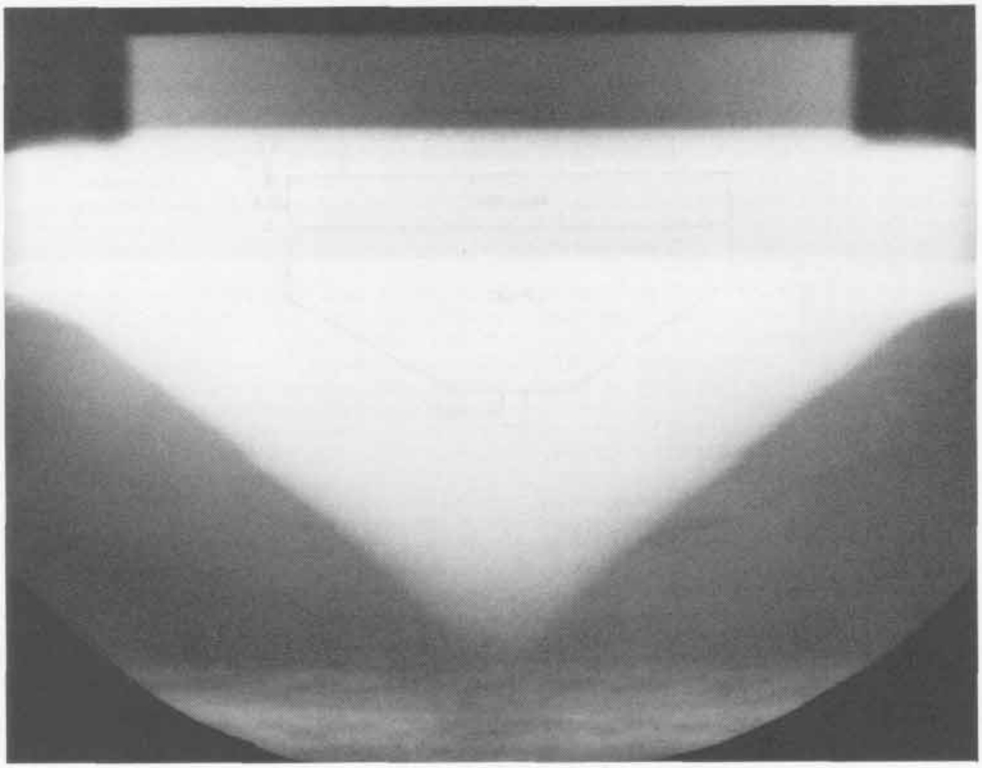


SHOT 1078: **Polyethylene Shock Wave**
Date: August 27, 1970
Experimenter: Douglas Venable
Radiographic Time: 26.18 μs
A polyethylene block was shocked by 25.4 mm of PBX-9404 initiated by a P-081 lens. h was 5.0 mm. See Shot 1079.









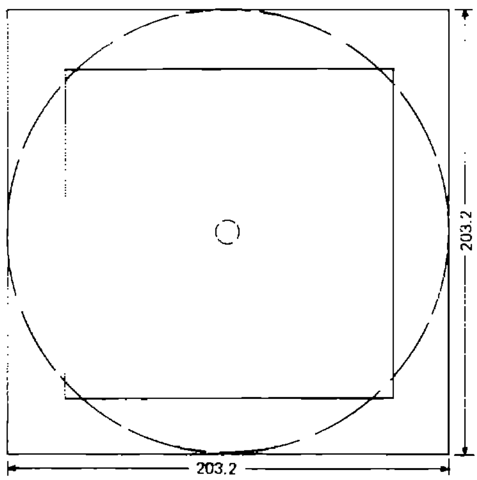
SHOT 1079: **Polyethylene Shock Wave**

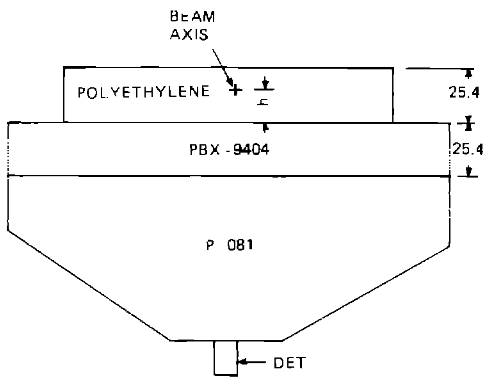
Date: August 19, 1970

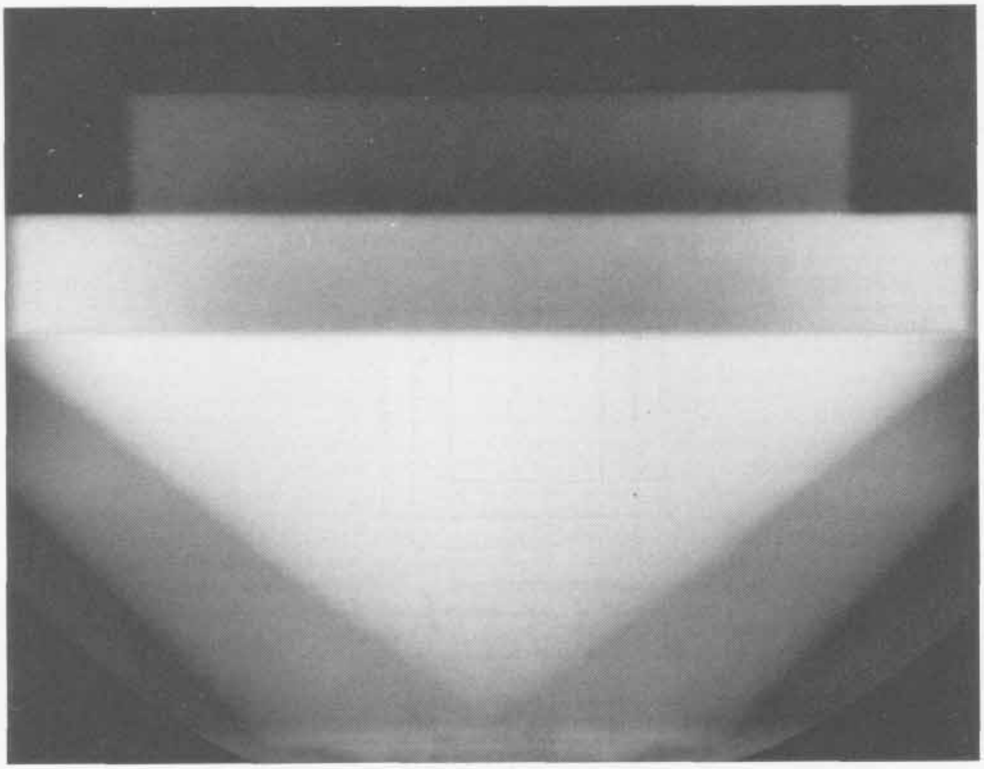
Experimenter: Douglas Venable

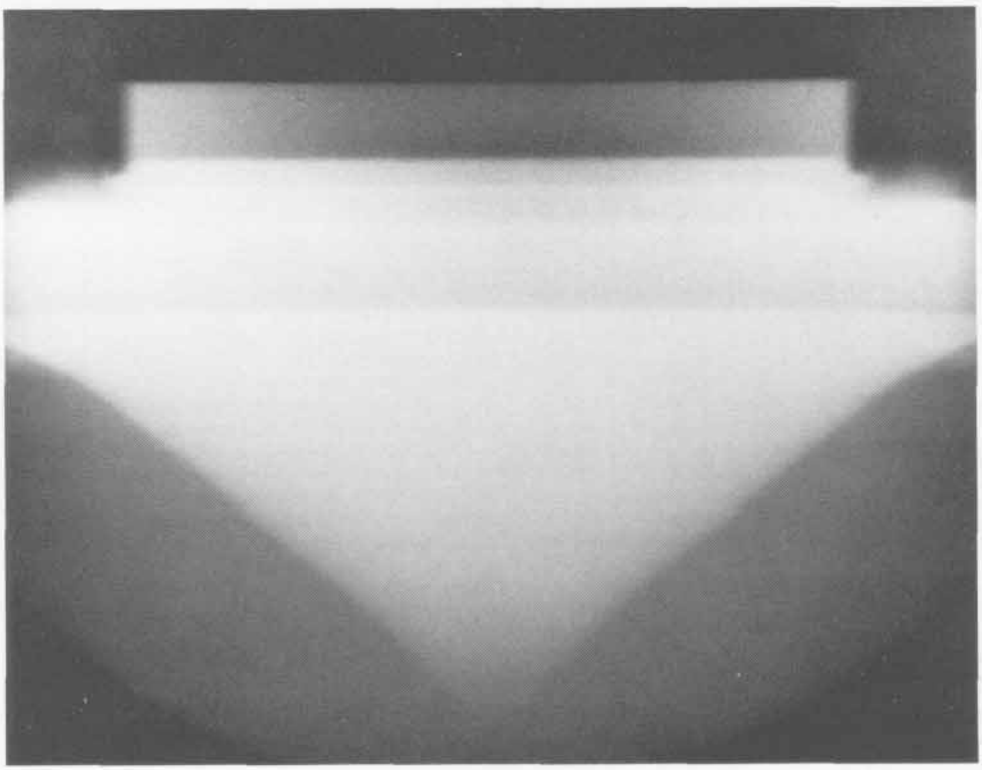
Radiographic Time: 26.90 μs

A polyethylene block was shocked by 25.4 mm of PBX-9404 initiated by a P-081 lens. h was 10.0 mm. See Shot 1078.



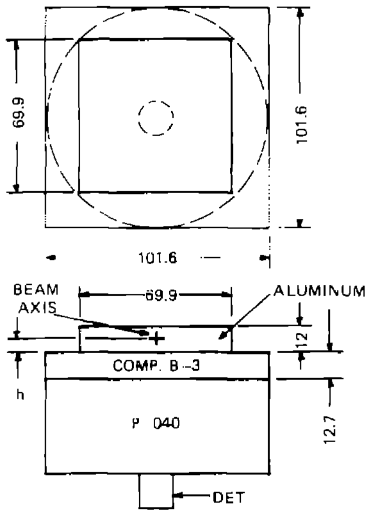


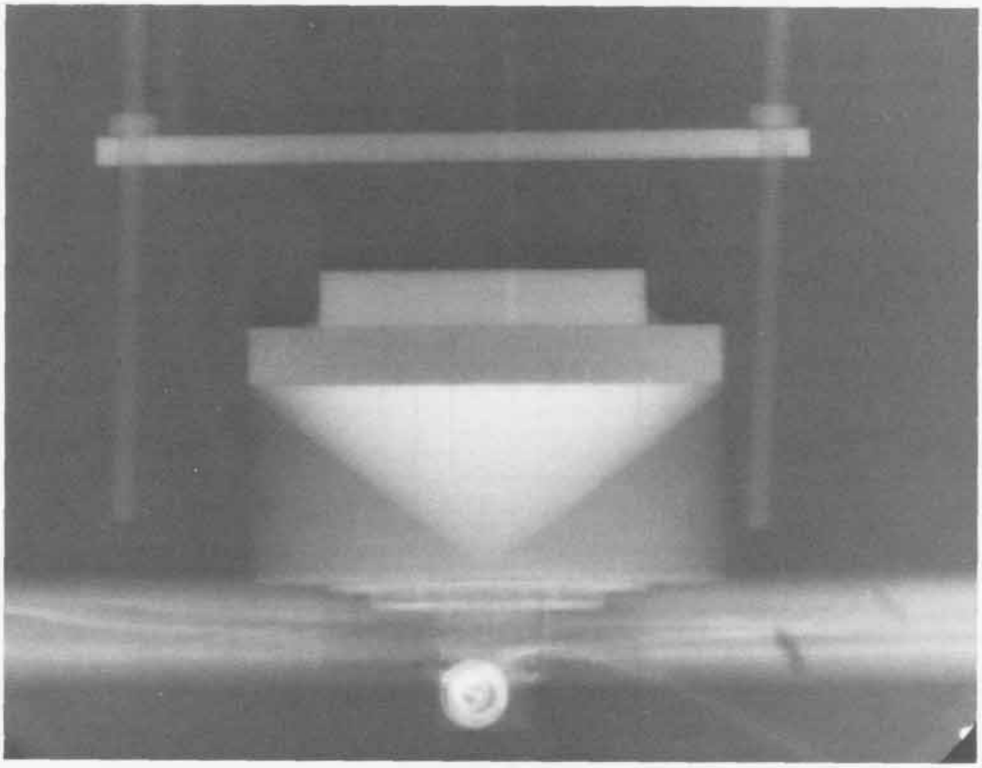


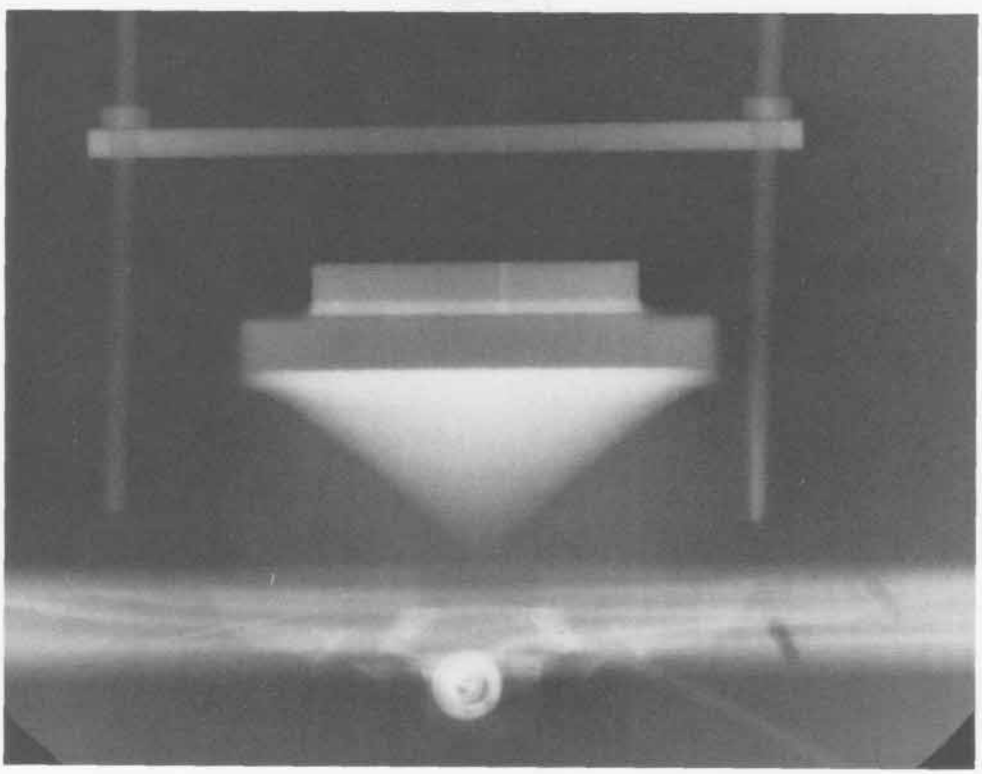


SHOT 1096: **Aluminum Back Surface**
Date: June 3, 1969
Experimenter: Roger K. London
Radiographic Time: 15.76 μs

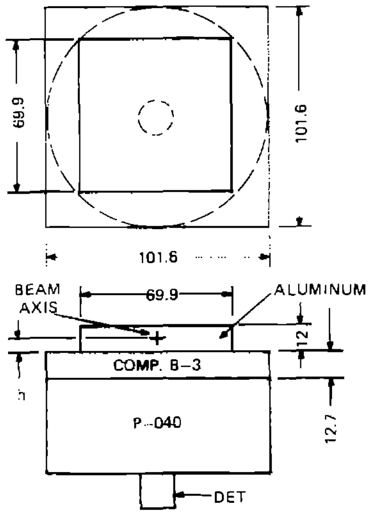
A 12.0-mm-thick aluminum plate was shocked by 12.7 mm of Composition B-3 initiated by a P-040 lens. h was 0.61 mm. A reference bar is shown above the shot.

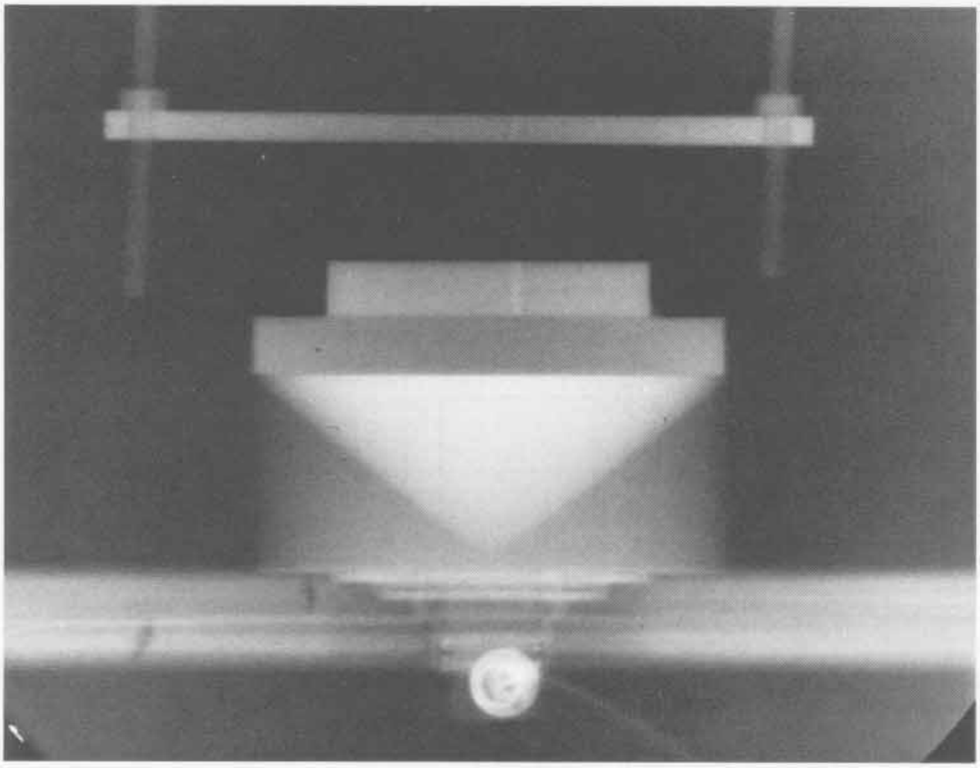


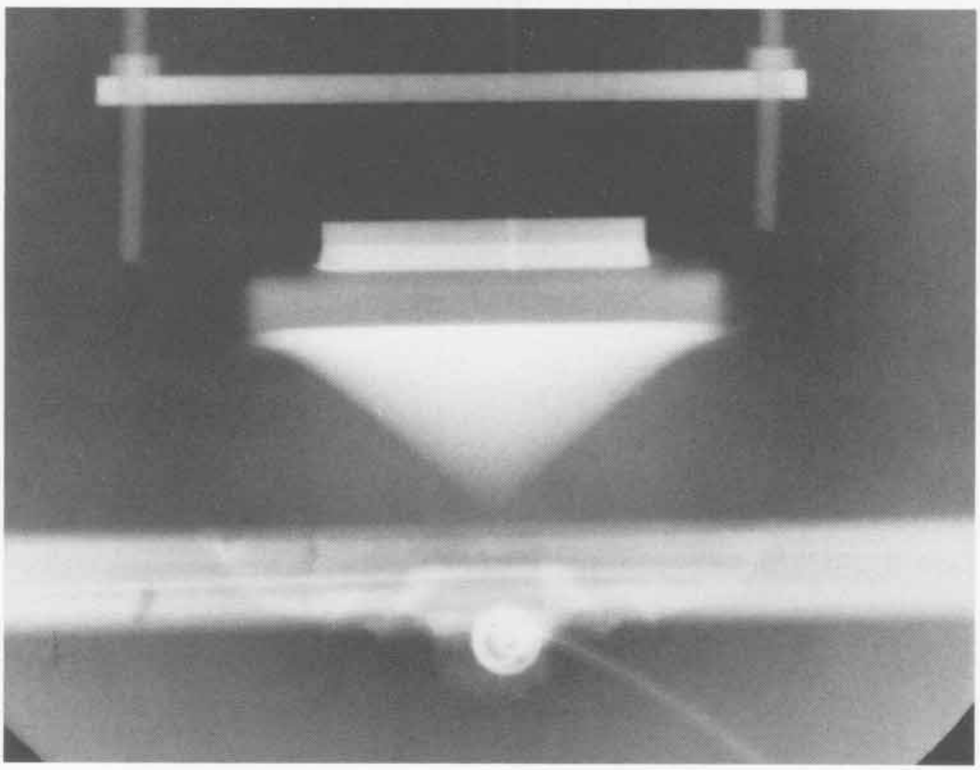




SHOT 1097: **Aluminum Back Surface**
Date: June 4, 1969
Experimenter: Roger K. London
Radiographic Time: 16.17 μs
A 12.0-mm-thick aluminum plate was shocked by 12.7 mm of Composition B-3 initiated by a P-040 lens. h was 0.99 mm. A reference bar is shown above the shot.







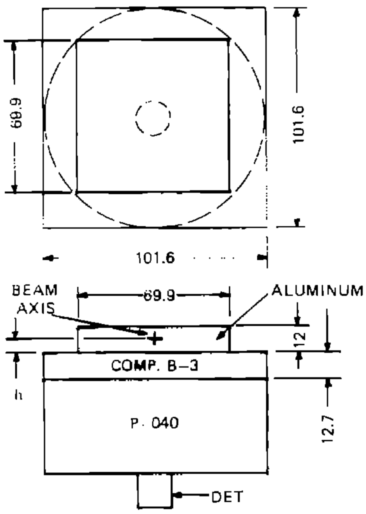
SHOT 1098: **Aluminum Back Surface**

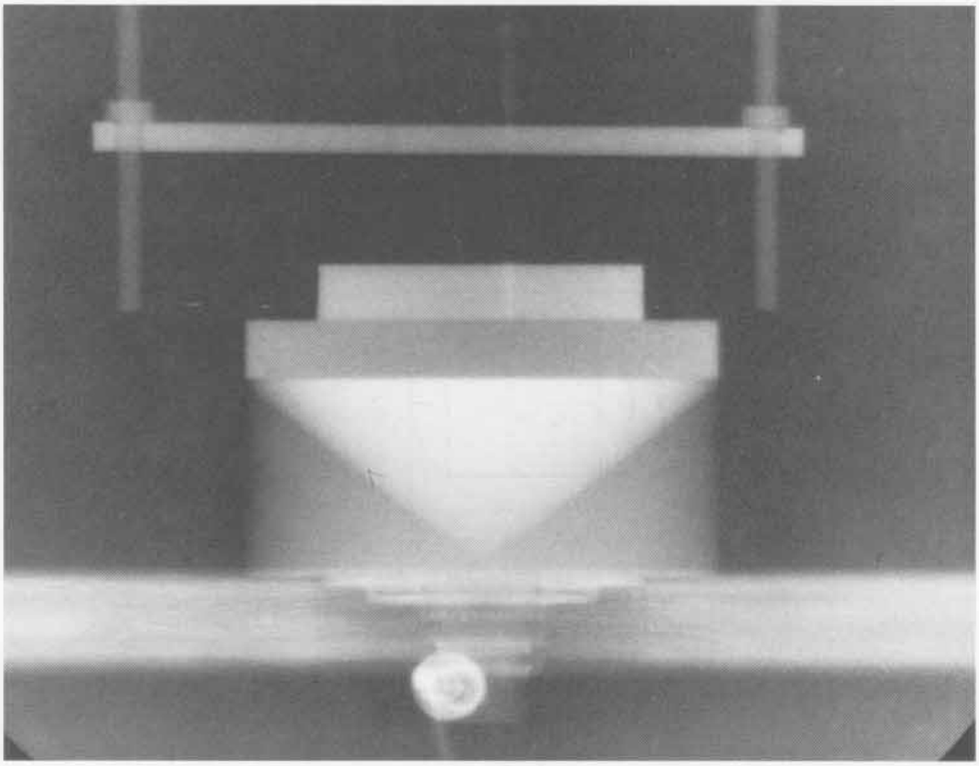
Date: May 21, 1969

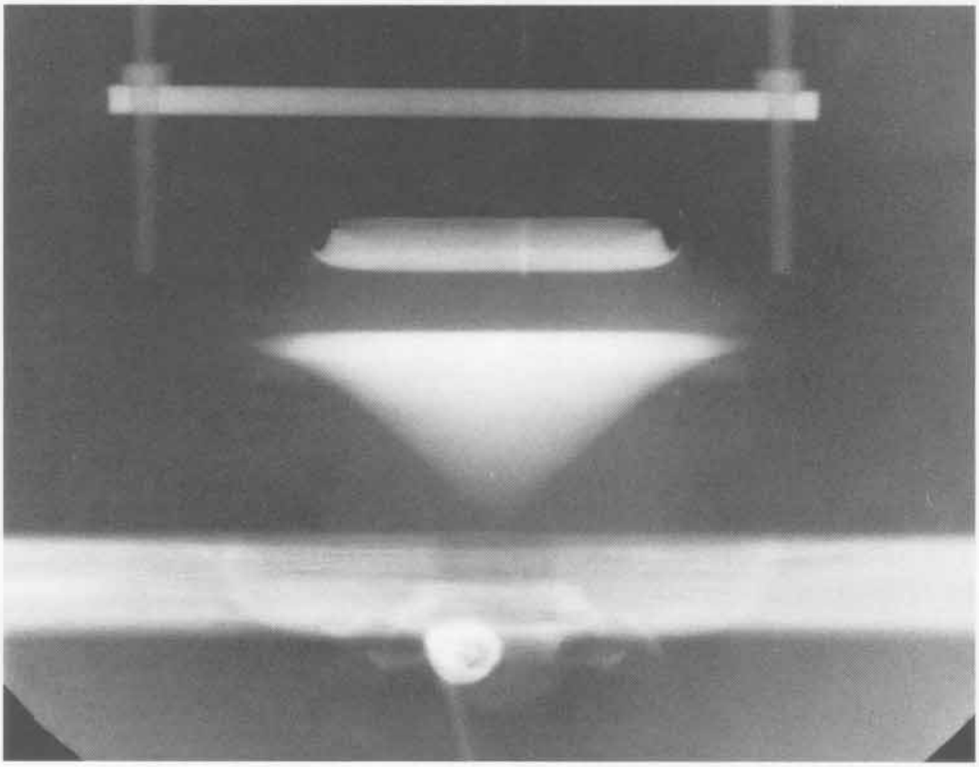
Experimenter: Roger K. London

Radiographic Time: 17.87 μs

A 12.0-mm-thick aluminum plate was shocked by 12.7 mm of Composition B-3 initiated by a P-040 lens. h was 2.41 mm. A reference bar is shown above the shot.

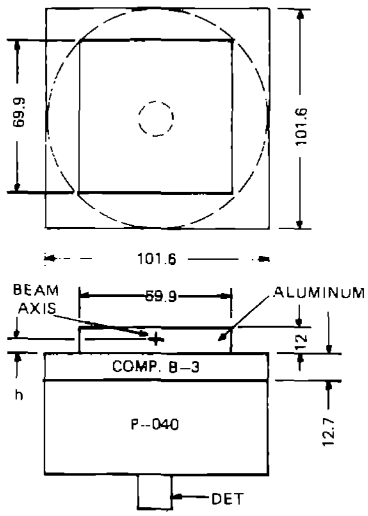


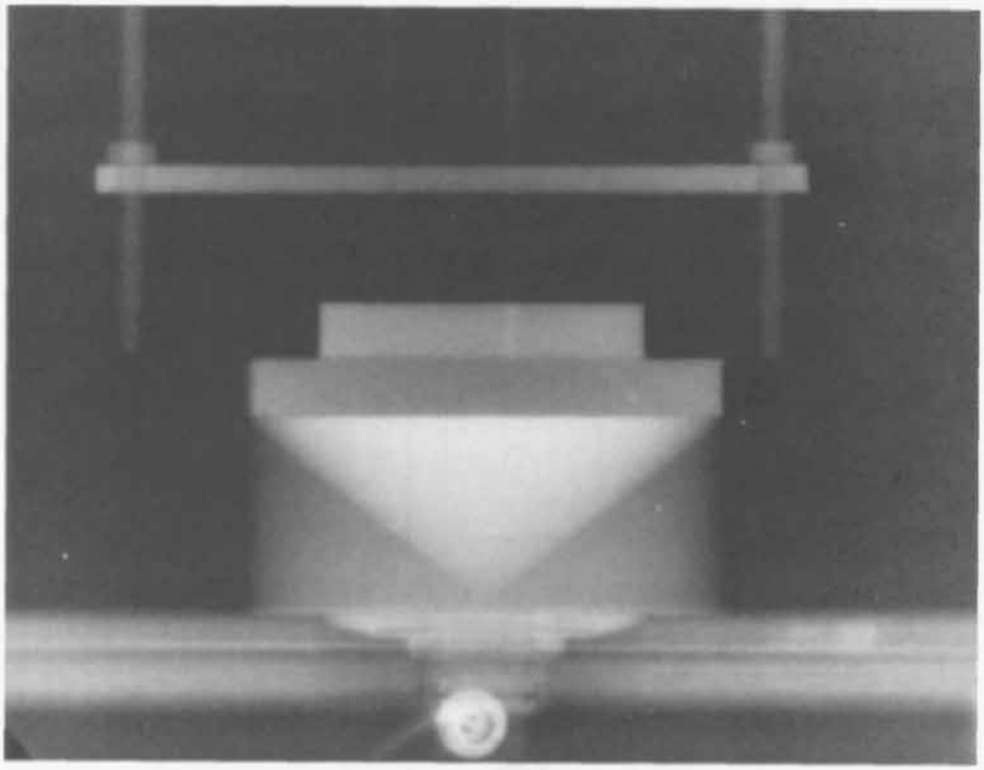


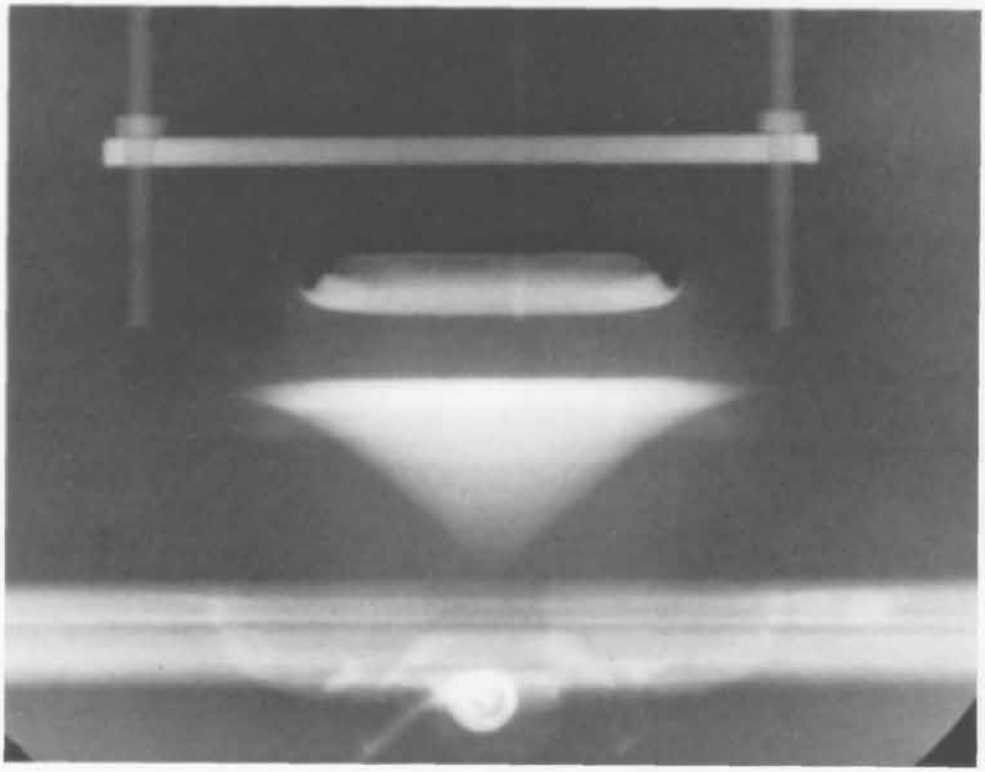


SHOT 1099:	**Aluminum Back Surface**
Date:	May 21, 1969
Experimenter:	Roger K. London
Radiographic Time:	18.82 μs

A 12.0-mm-thick aluminum plate was shocked by 12.7 mm of Composition B-3 initiated by a P-040 lens. h was 3.00 mm. A reference bar is shown above the shot.







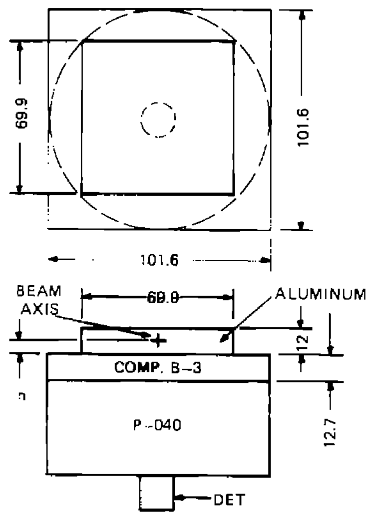
SHOT 1100: **Aluminum Back Surface**

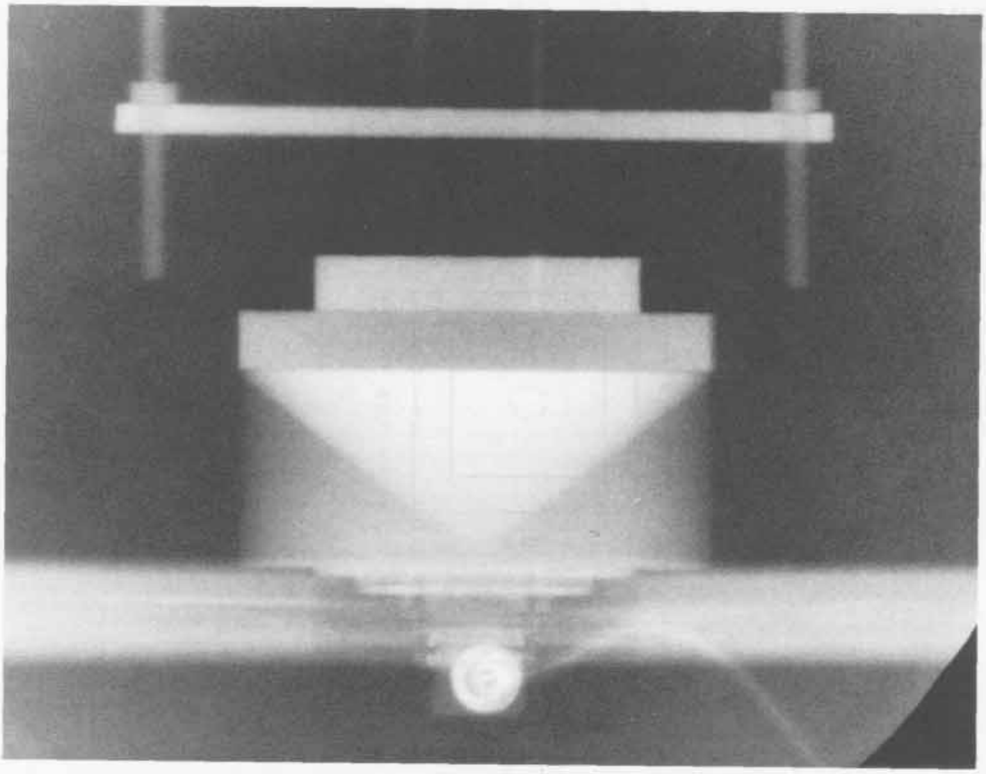
Date: June 4, 1969

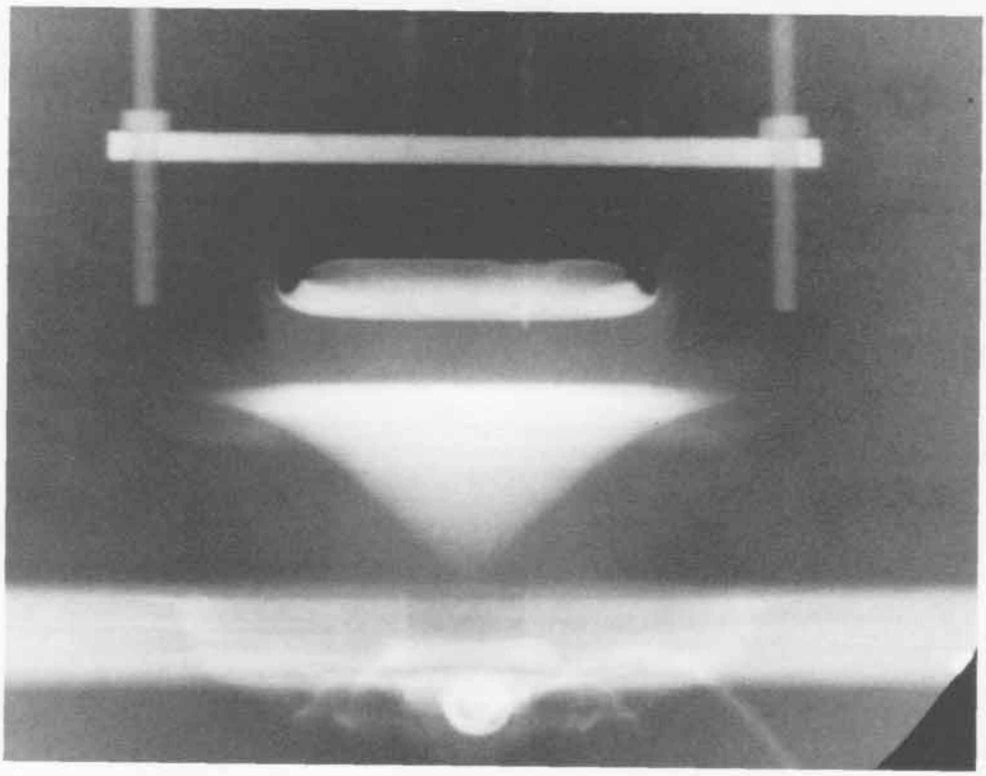
Experimenter: Roger K. London

Radiographic Time: 19.03 μs

A 12.0-mm-thick aluminum plate was shocked by 12.7 mm of Composition B-3 initiated by a P-040 lens. h was 3.50 mm. A reference bar is shown above the shot.







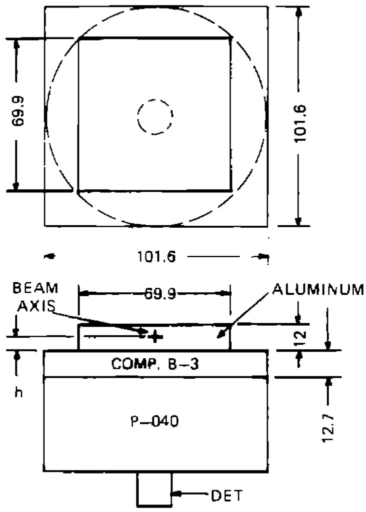
SHOT 1101: **Aluminum Back Surface**

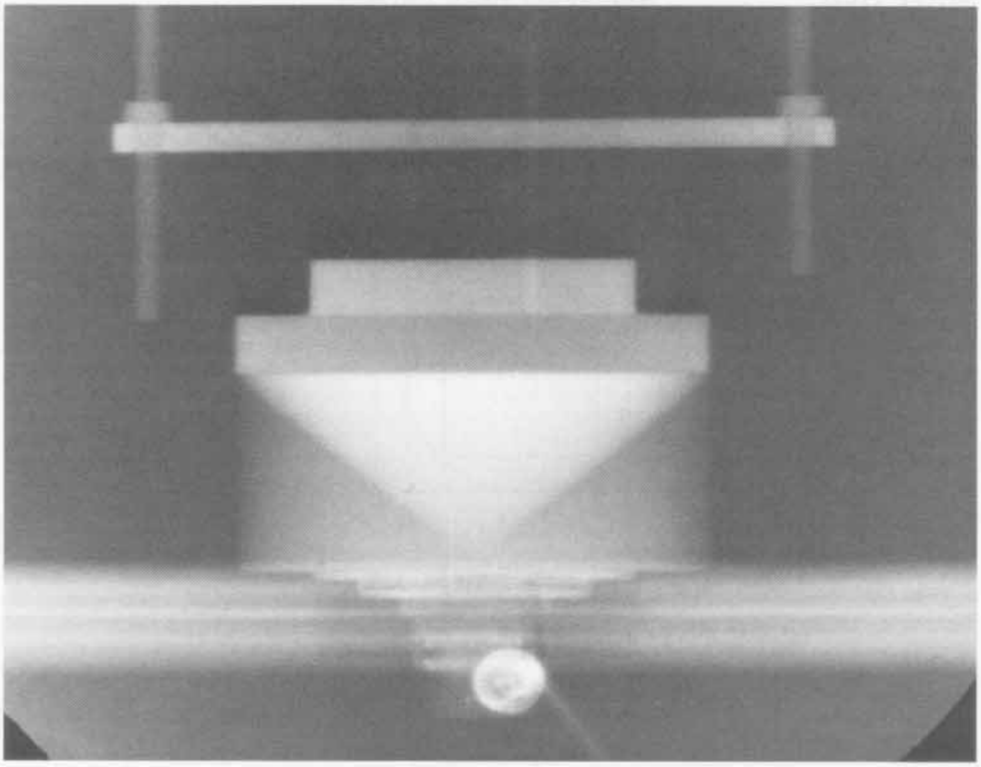
Date: June 4, 1969

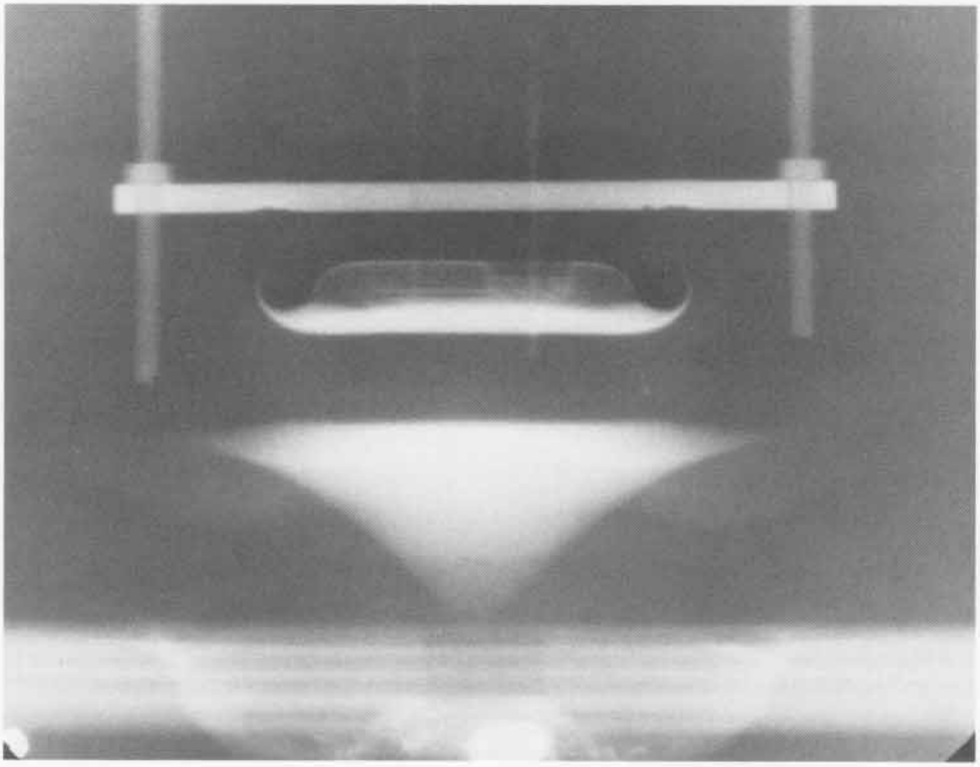
Experimenter: Roger K. London

Radiographic Time: 22.37 μs

A 12.0-mm-thick aluminum plate was shocked by 12.7 mm of Composition B-3 initiated by a P-040 lens. h was 10.21 mm. A reference bar is shown above the shot.

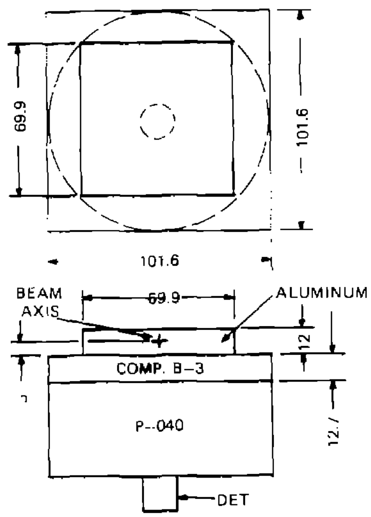


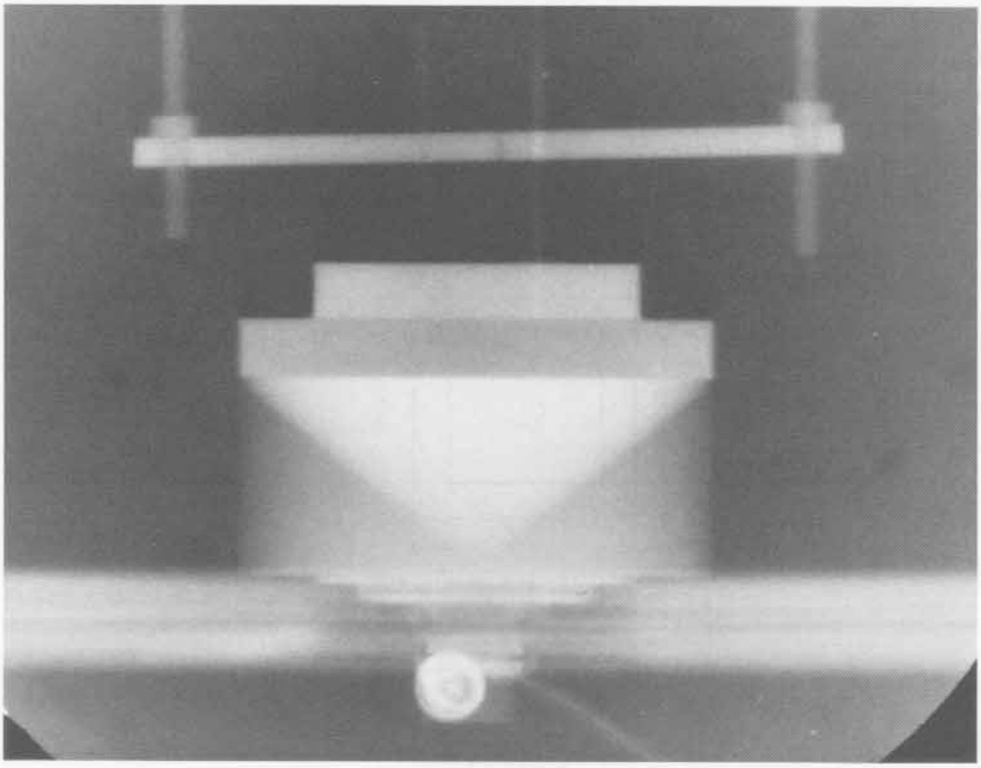


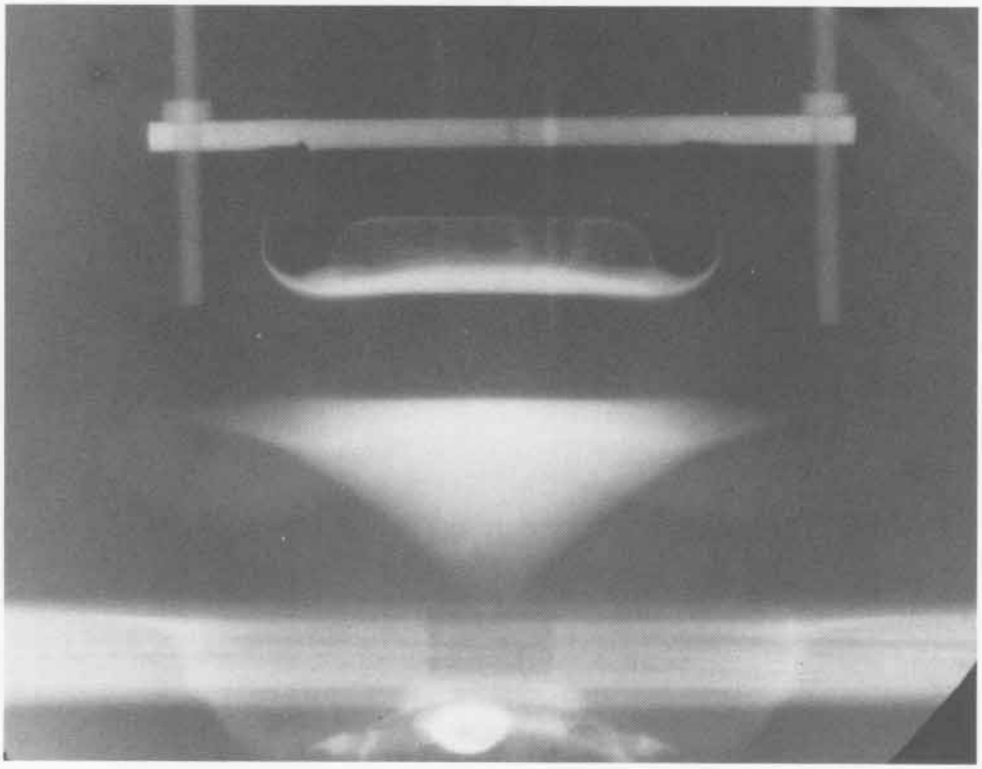


SHOT 1102: **Aluminum Back Surface**
Date: June 5, 1969
Experimenter: Roger K. London
Radiographic Time: 23.43 μs

A 12.0-mm-thick aluminum plate was shocked by 12.7 mm of Composition B-3 initiated by a P-040 lens. h was 12.01 mm. A reference bar is shown above the shot.

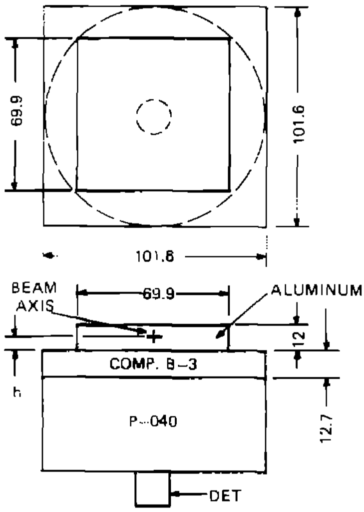


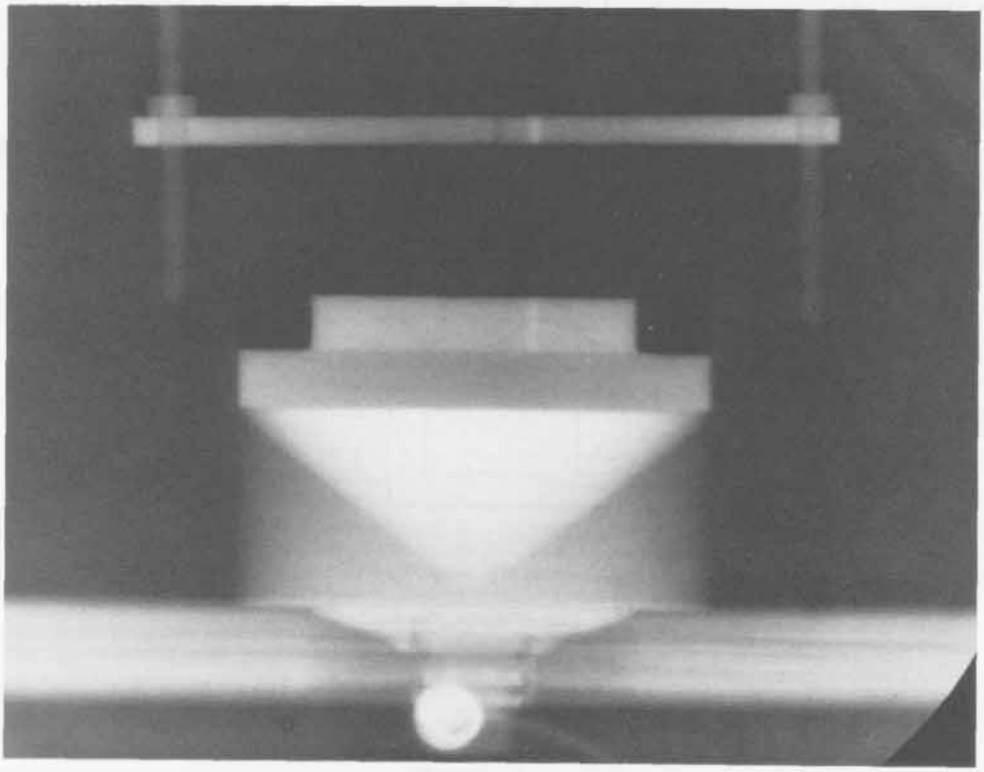


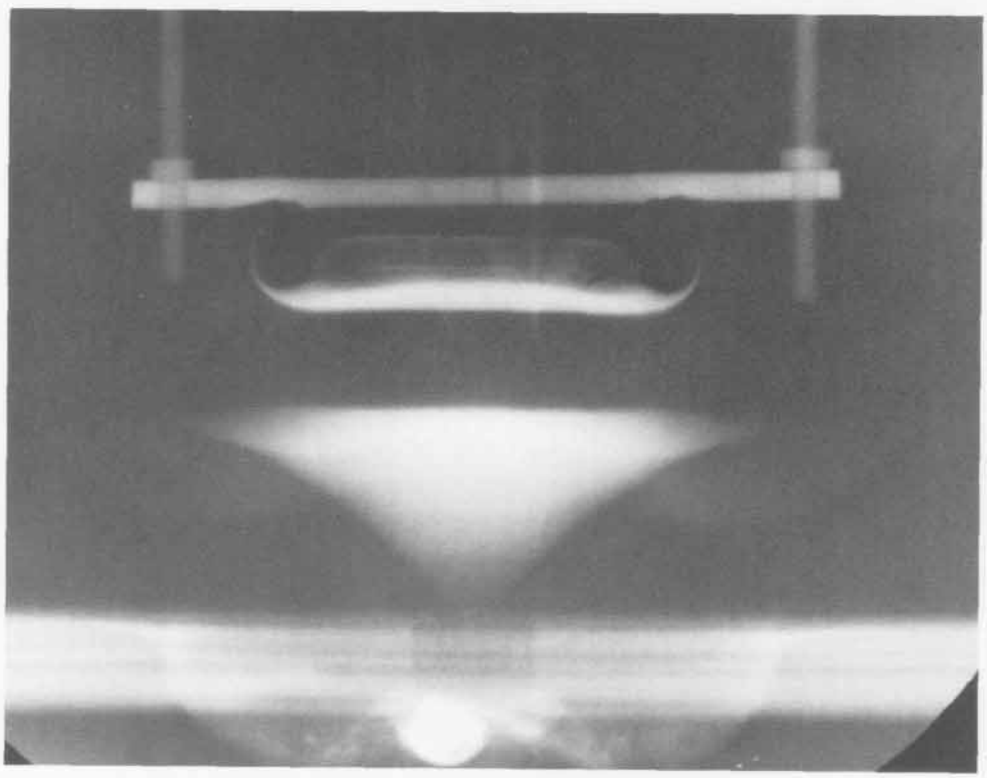


SHOT 1103: **Aluminum Back Surface**
Date: June 5, 1969
Experimenter: Roger K. London
Radiographic Time: 24.35 μs

A 12.0-mm-thick aluminum plate was shocked by 12.7 mm of Composition B-3 initiated by a P-040 lens. h was 14.02 mm. A reference bar is shown above the shot.

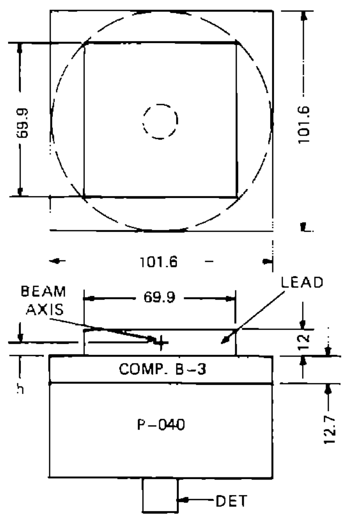


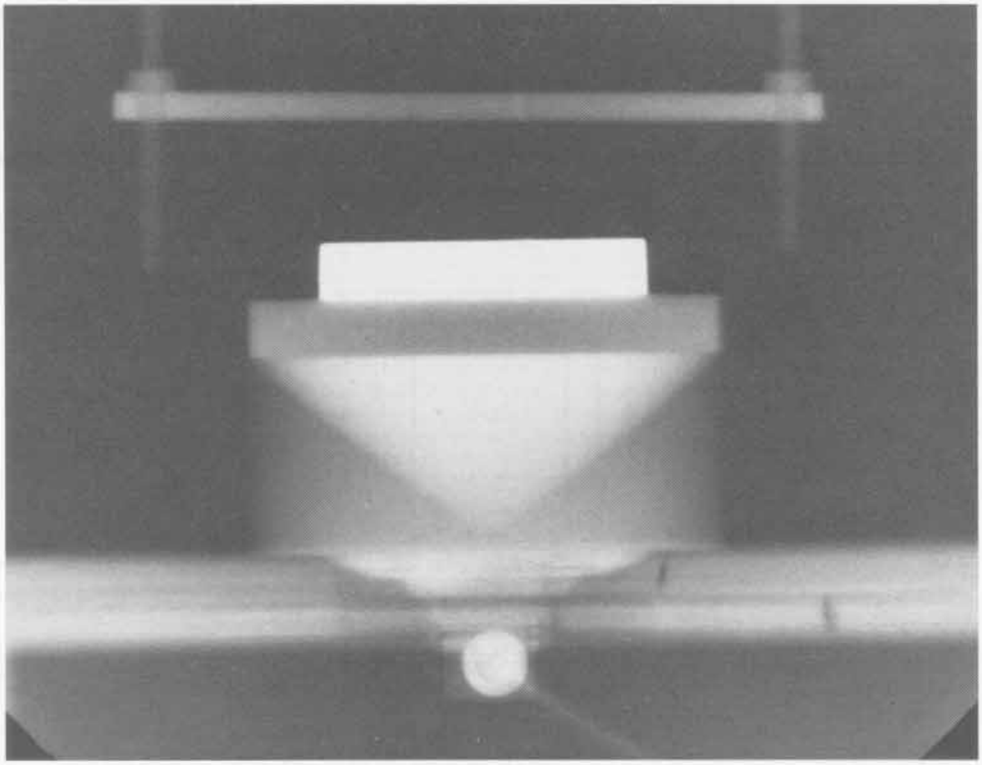


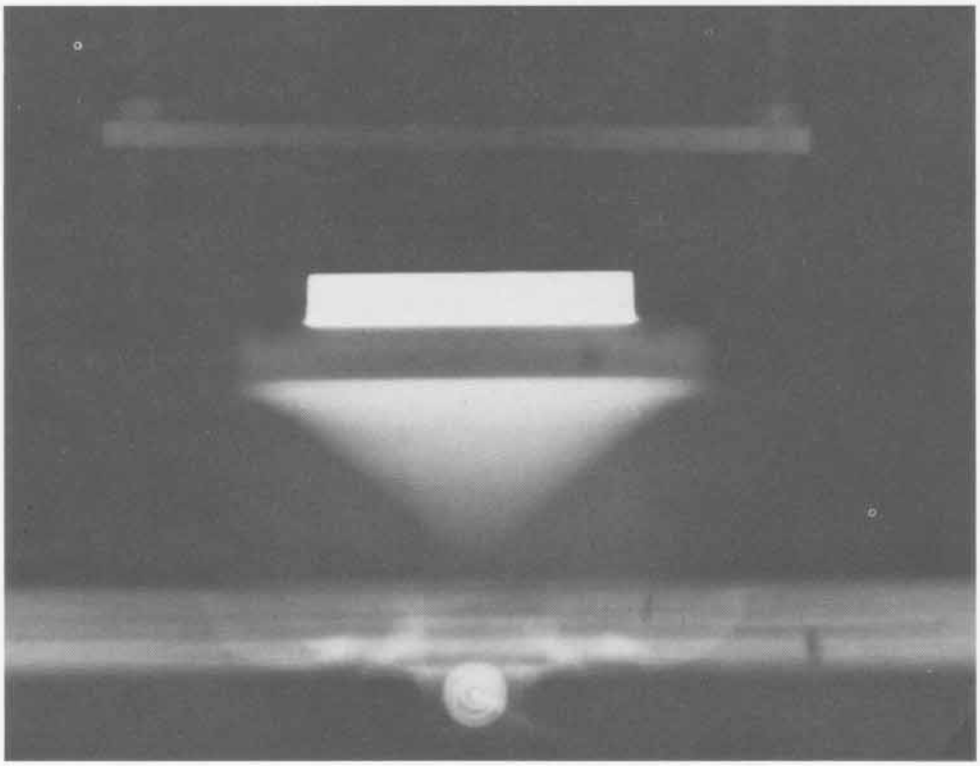


SHOT 1104: **Lead Back Surface**
Date: May 28, 1969
Experimenter: Roger K. London
Radiographic Time: 16.32 μs

A 12.0-mm-thick lead plate was shocked by 12.7 mm of Composition B-3 initiated by a P-040 lens. h was 0.81 mm. A reference bar is shown above the shot.

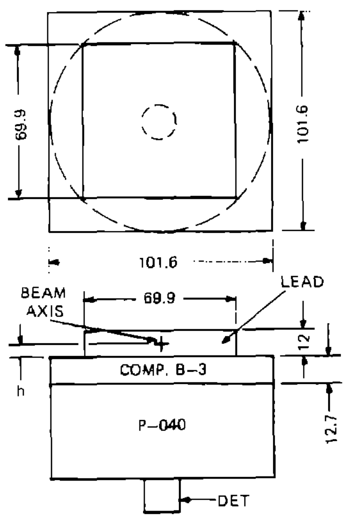


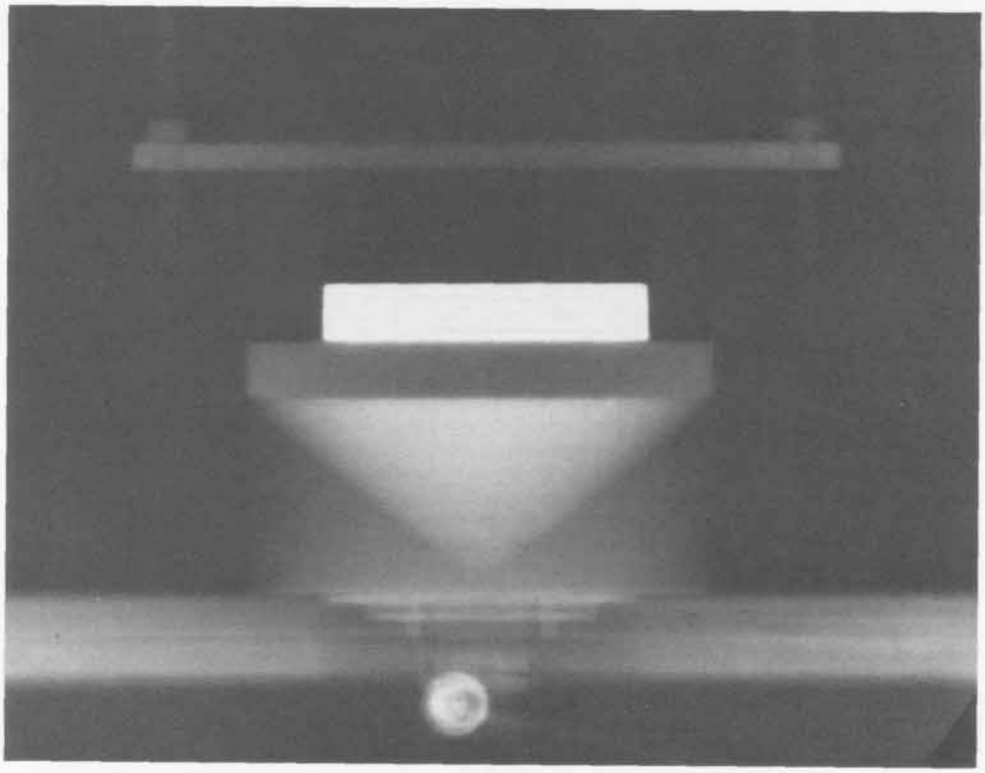


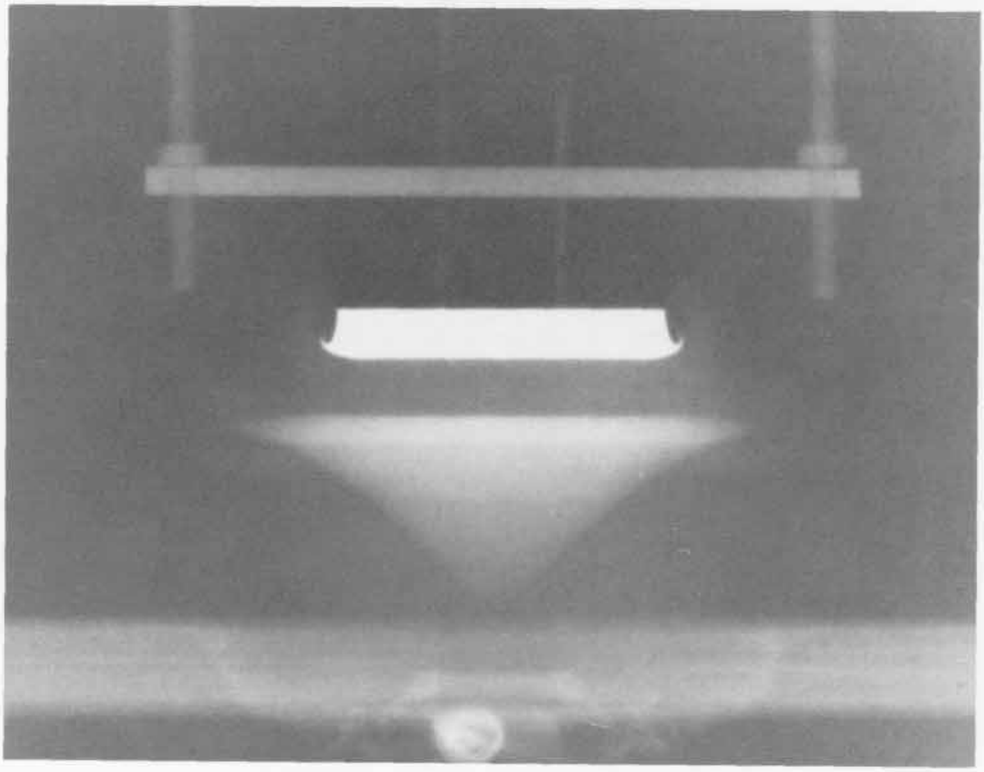


SHOT 1105: **Lead Back Surface**
Date: May 28, 1969
Experimenter: Roger K. London
Radiographic Time: 18.85 μs

A 12.0-mm-thick lead plate was shocked by 12.7 mm of Composition B-3 initiated by a P-040 lens. h was 2.00 mm. A reference bar is shown above the shot.

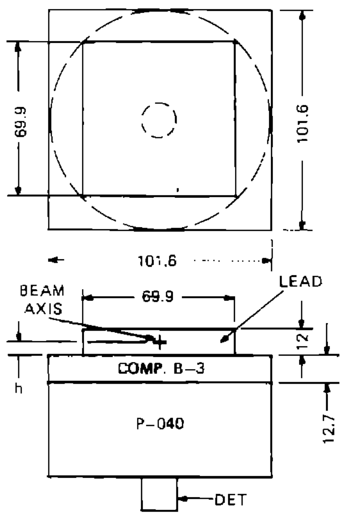


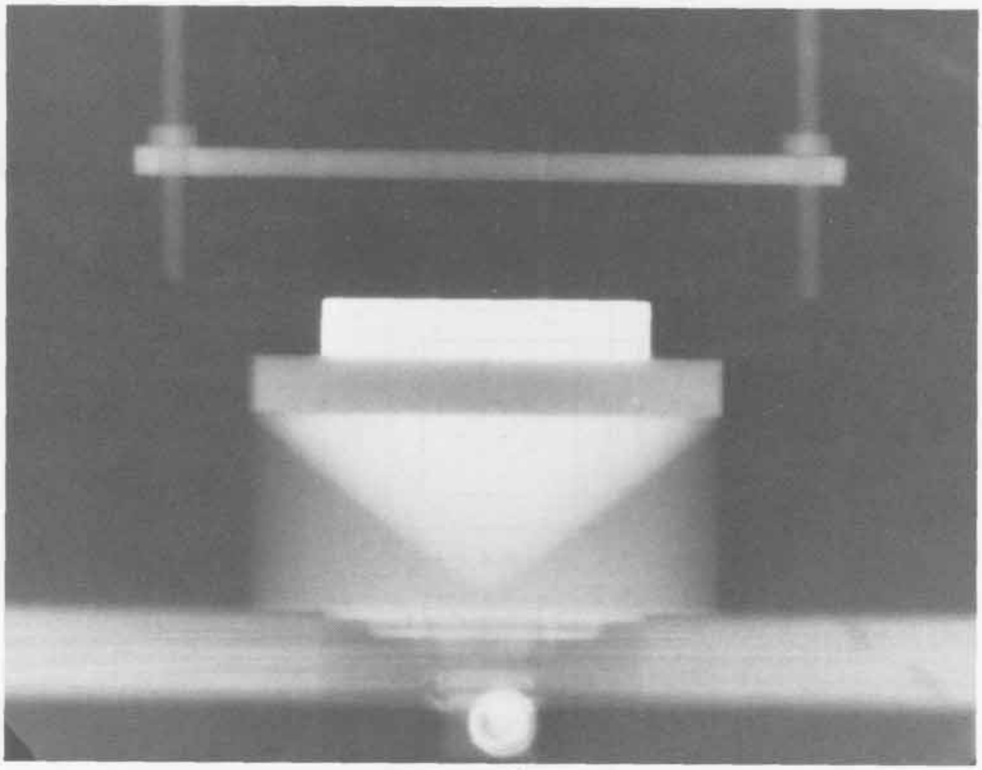


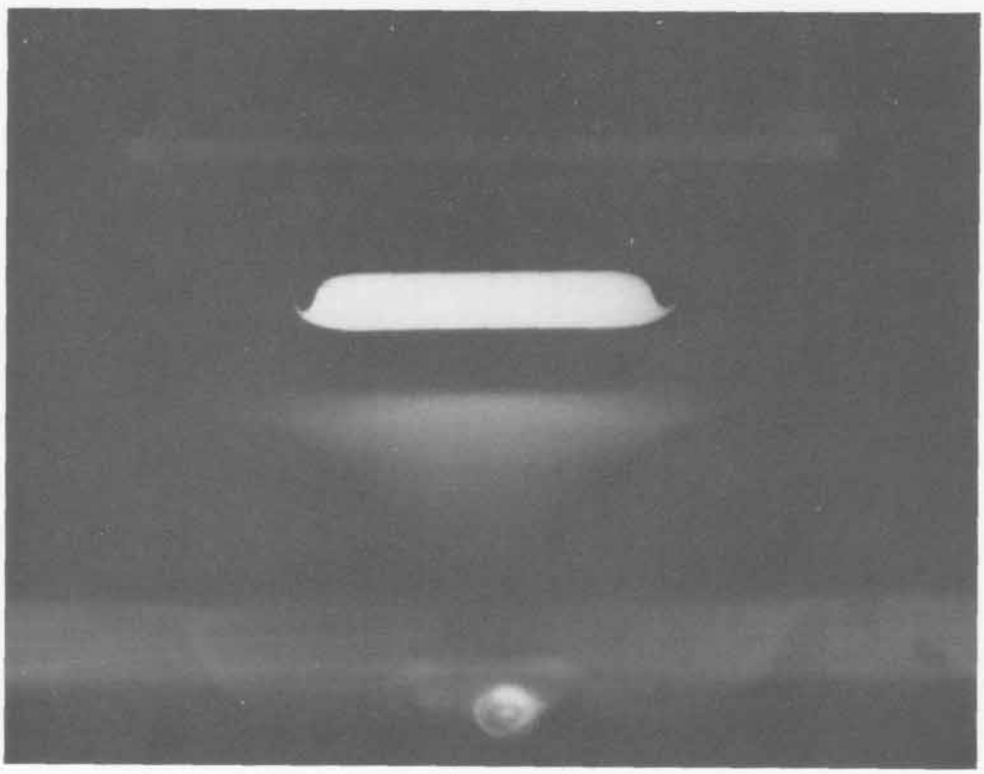


SHOT 1106: **Lead Back Surface**
Date: May 28, 1969
Experimenter: Roger K. London
Radiographic Time: 21.33 μs

A 12.0-mm-thick lead plate was shocked by 12.7 mm of Composition B-3 initiated by a P-040 lens. h was 2.79 mm. A reference bar is shown above the shot.

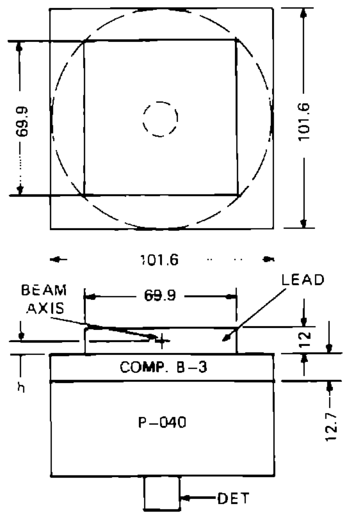


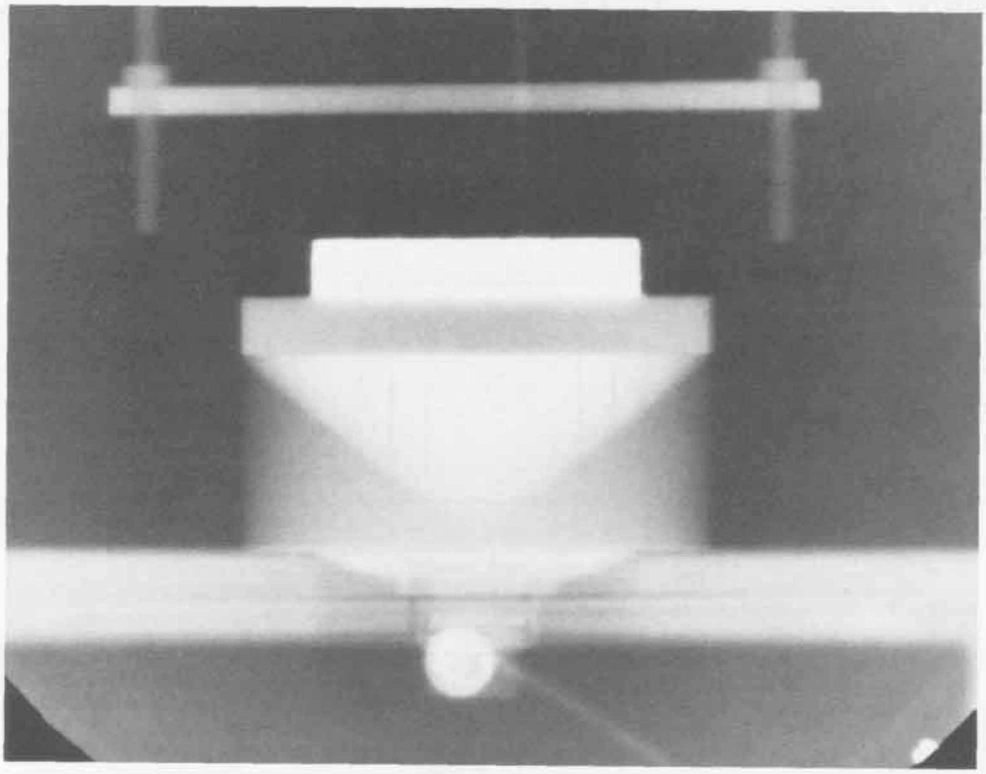


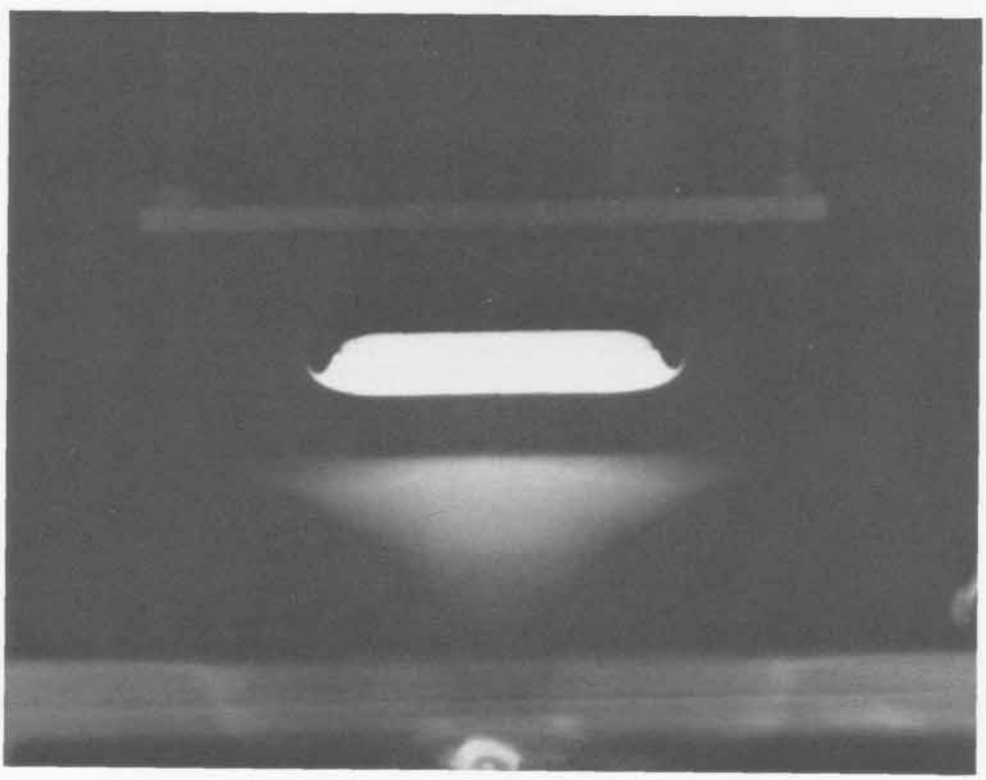


SHOT 1107: **Lead Back Surface**
Date: June 3, 1969
Experimenter: Roger K. London
Radiographic Time: 22.63 μs

A 12.0-mm-thick lead plate was shocked by 12.7 mm of Composition B-3 initiated by a P-040 lens. h was 3.20 mm. A reference bar is shown above the shot.

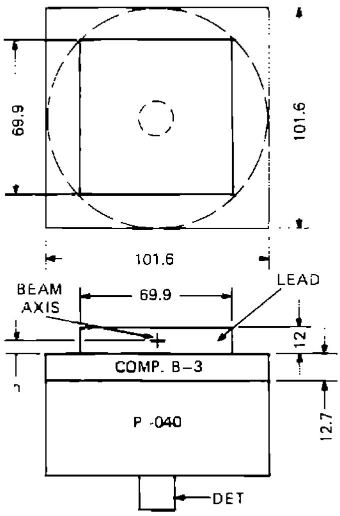


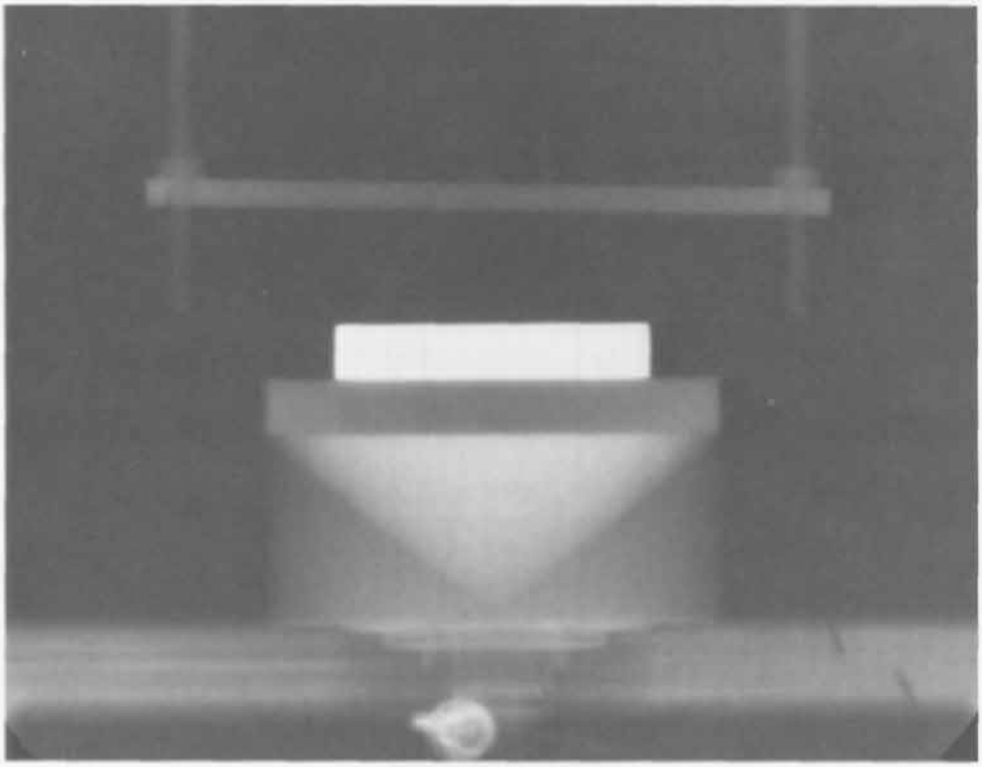


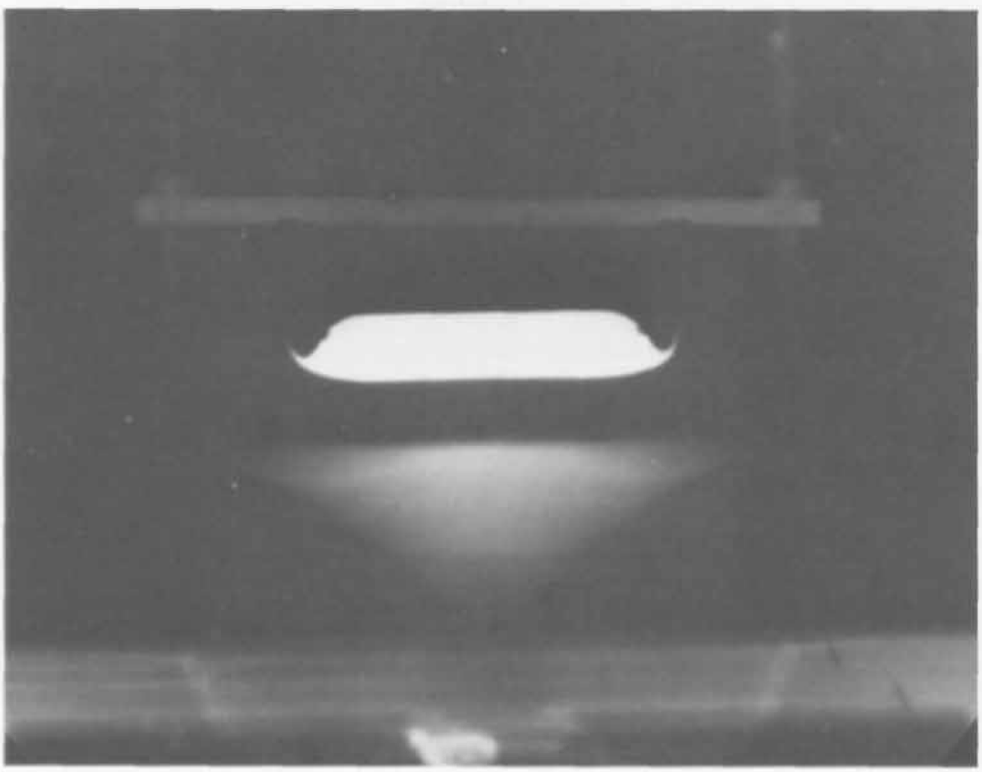


SHOT 1108: **Lead Back Surface**
Date: June 3, 1969
Experimenter: Roger K. London
Radiographic Time: 23.84 μs

A 12.0-mm-thick lead plate was shocked by 12.7 mm of Composition B-3 initiated by a P-040 lens. h was 3.50 mm. A reference bar is shown above the shot.

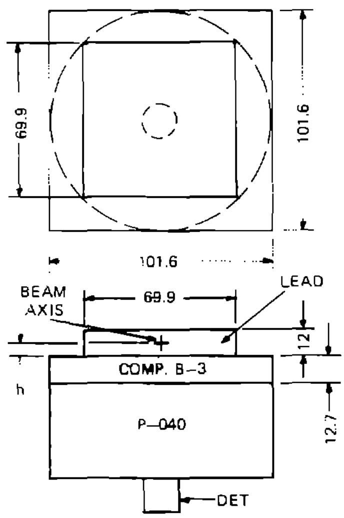


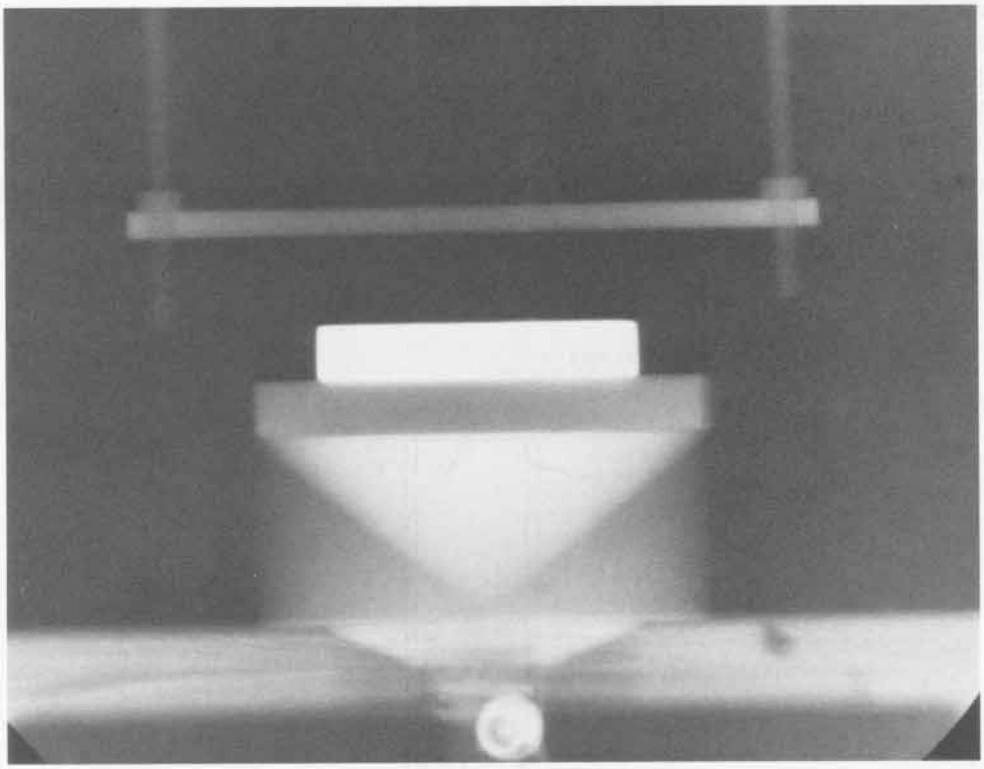


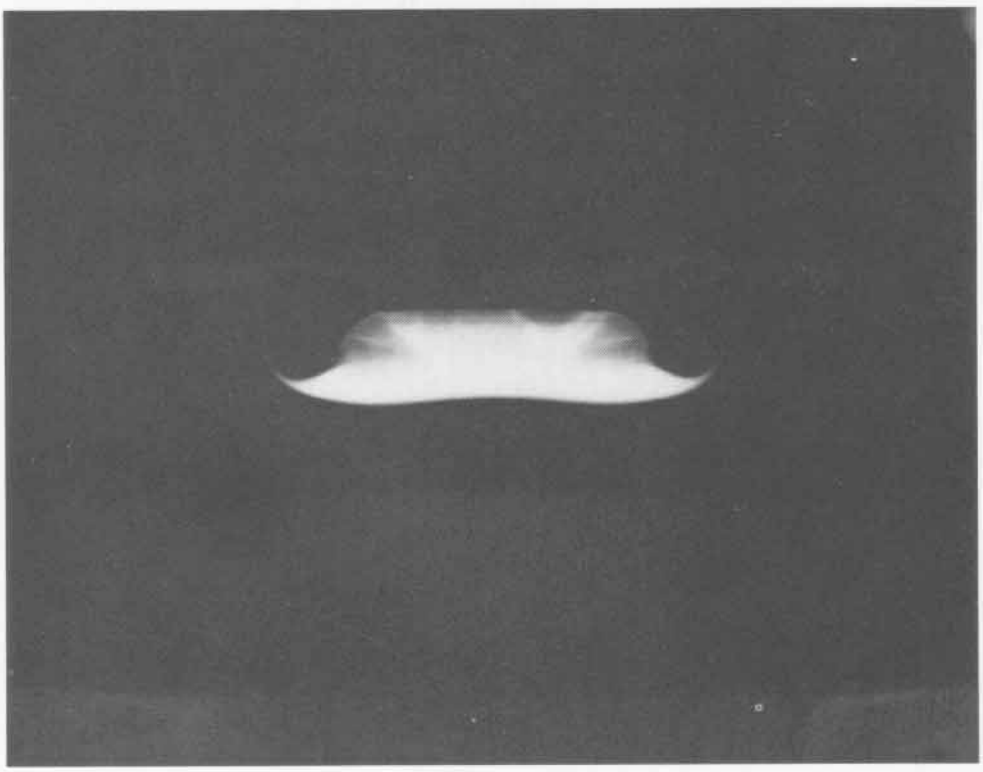


SHOT 1109: **Lead Back Surface**
Date: June 3, 1969
Experimenter: Roger K. London
Radiographic Time: 32.39 μs

A 12.0-mm-thick lead plate was shocked by 12.7 mm of Composition B-3 initiated by a P-040 lens. h was 9.50 mm. A reference bar is shown above the shot.

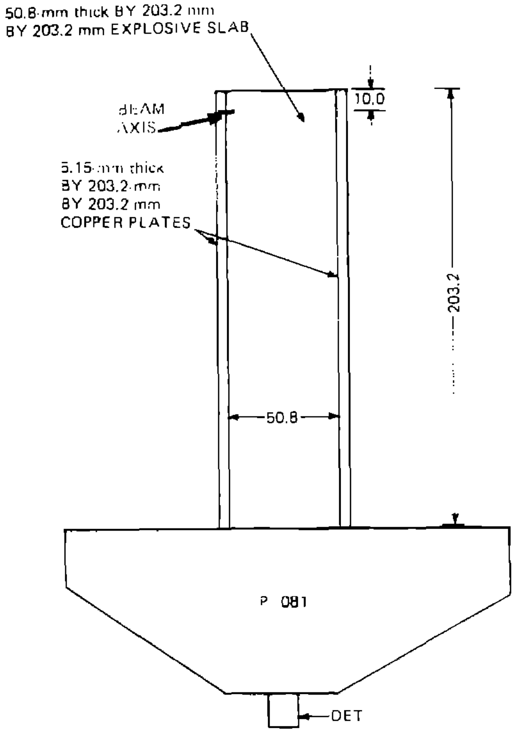


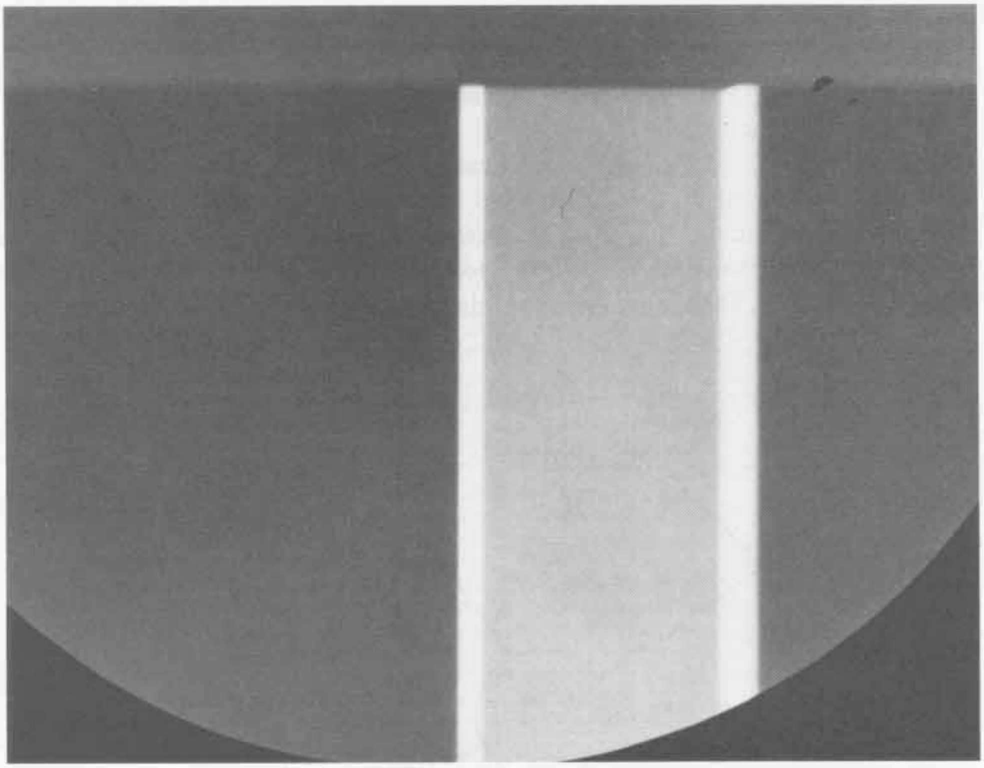


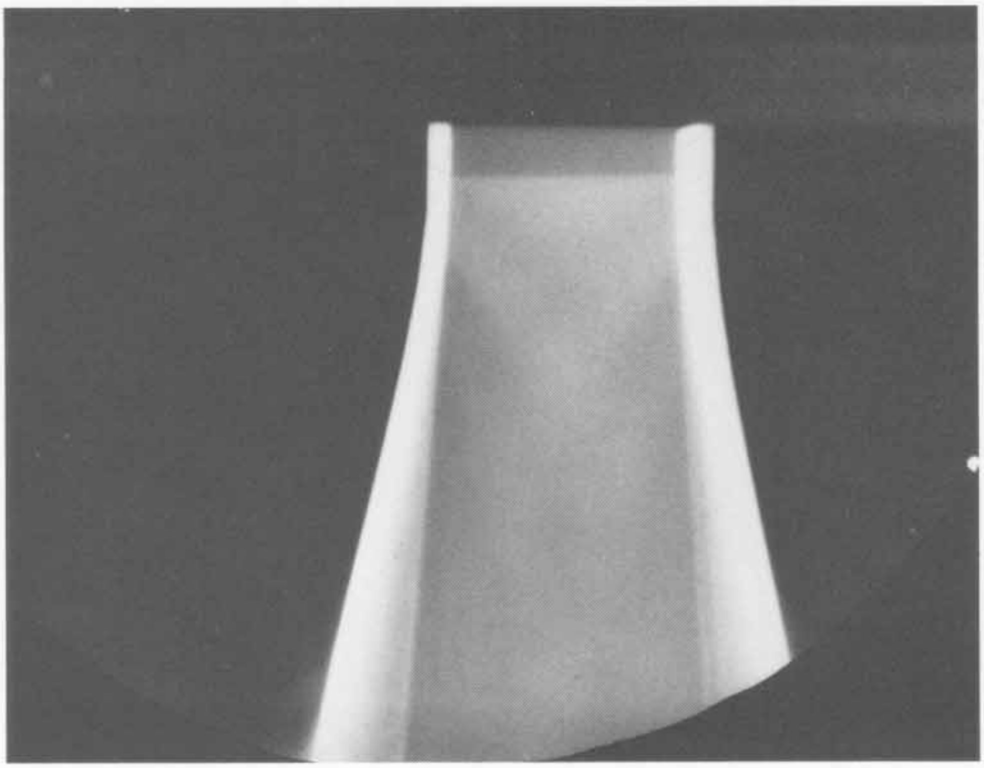


SHOT 1112: **PBX-9404 Confined by Copper**
Date: May 13, 1969
Experimenter: William C. Davis
Radiographic Time: 44.52 μs

A 50.8-mm-wide by 203.2-mm-long slab of PBX-9404 was confined by 5.15-mm-thick copper plates. The PBX-9404 was initiated by a P-081 lens. The experiment was designed to investigate the features of the cylinder test that is used for evaluating explosive performance. See also Shot 1120.

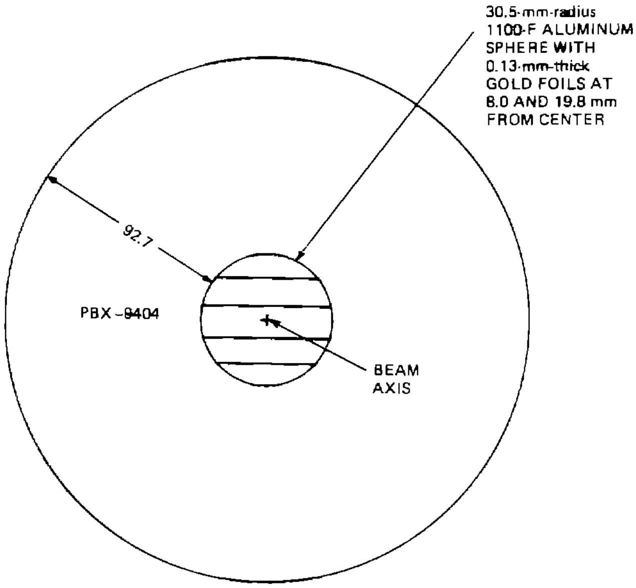


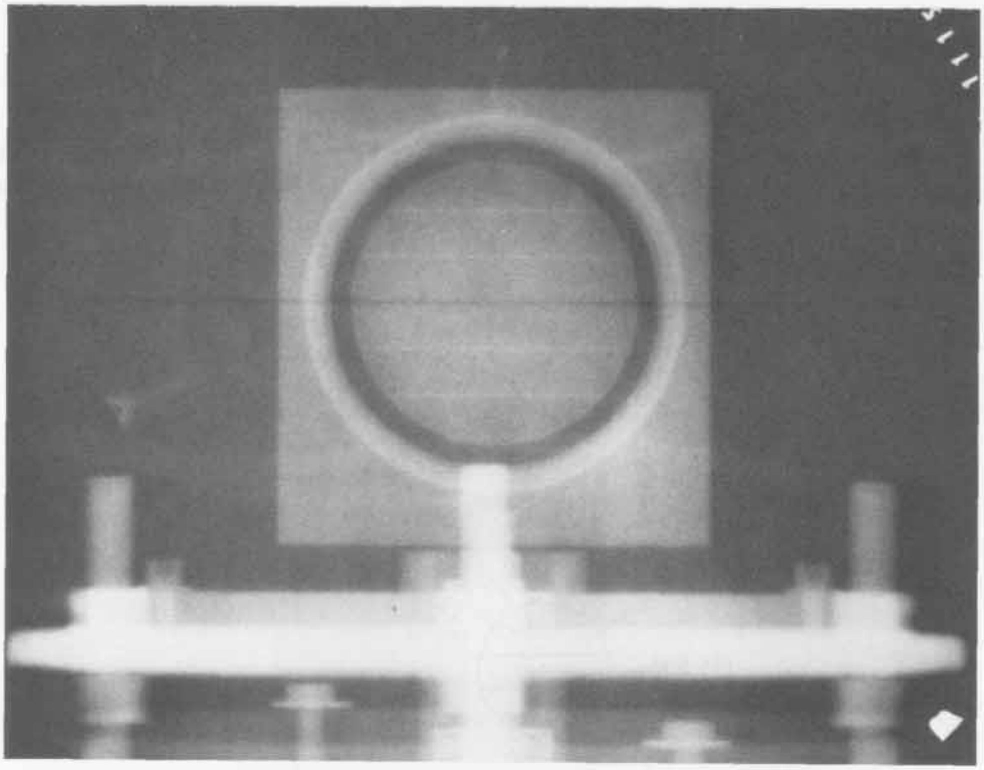


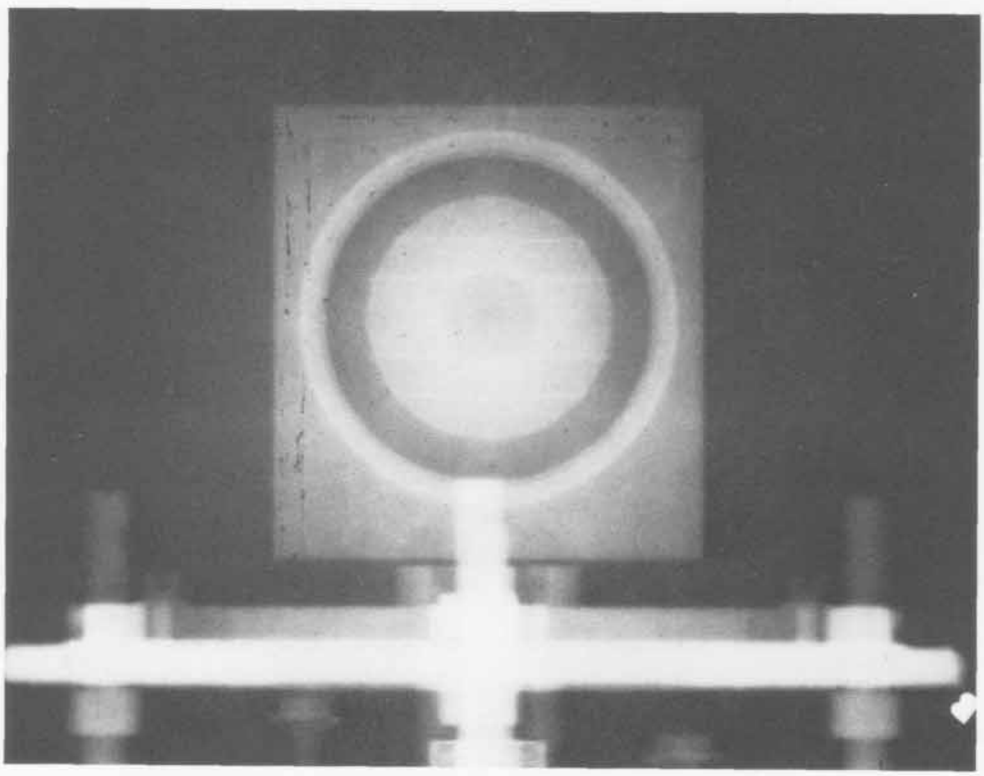


SHOT 1115: **Converging Aluminum Shock Wave**
Date: July 16, 1970
Experimenter: Reynaldo Morales
Radiographic Time: 27.45 μs
References: Mader and Craig, 1975; Mader, 1979

The shock wave was formed in a 30.48-mm sphere of 1100-F aluminum by a detonated surrounding sphere of 92.7-cm-thick PBX-9404. The radius of the aluminum shock was 10.62 ± 0.35 mm and the PBX-9404/aluminum interface was 26.31 ± 0.17 mm. The shock wave traveled for 1.63 μs in the aluminum.

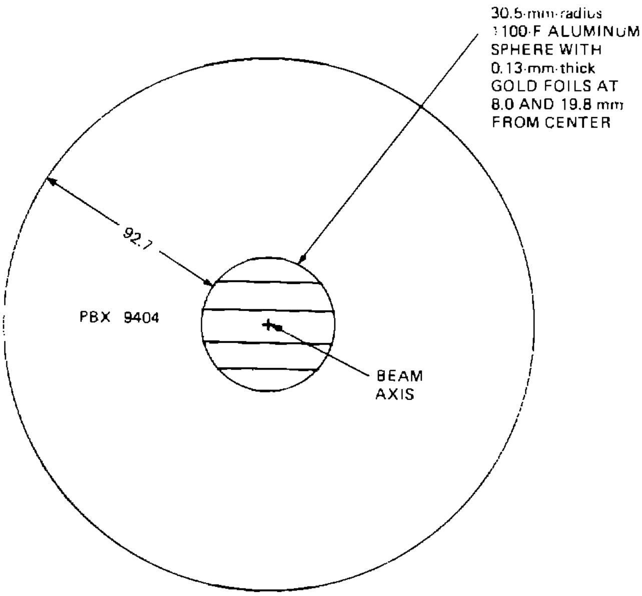


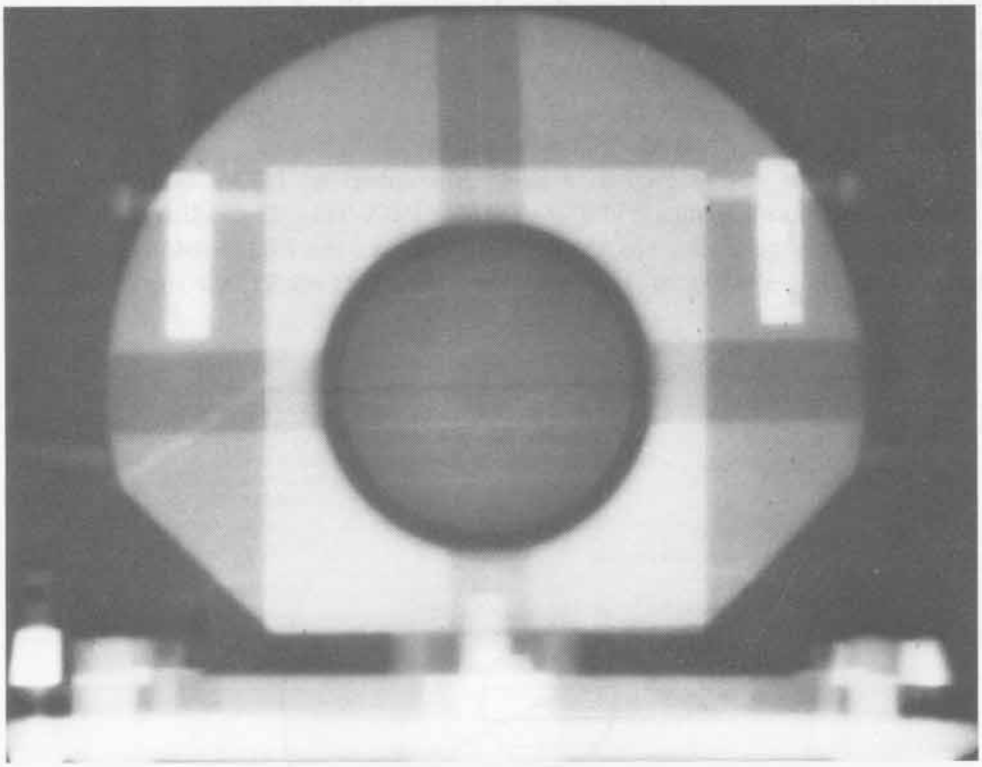


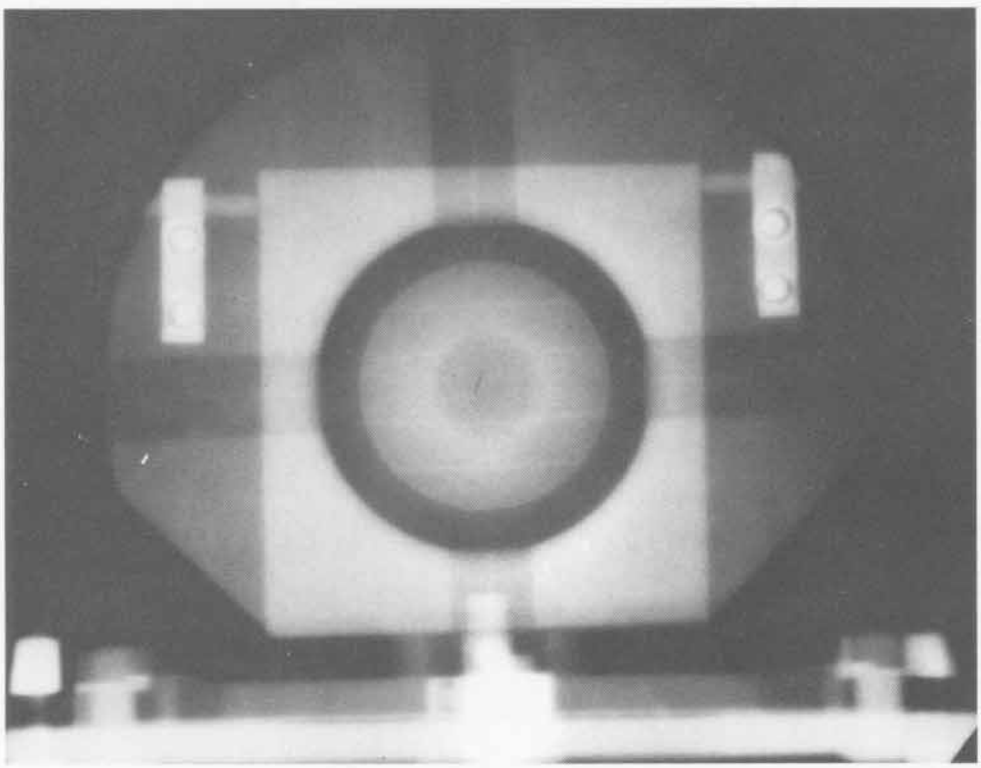


SHOT 1116: **Converging Aluminum Shock Wave**
Date: January 20, 1971
Experimenter: Reynaldo Morales
Radiographic Time: 27.35 μs

The shock wave was formed in a 30.48-mm sphere of 1100-F aluminum by a detonated surrounding sphere of 92.7-cm-thick PBX-9404. The radius of the aluminum shock wave was 11.33 ± 0.20 mm and the PBX-9404/aluminum interface was 26.48 ± 0.12 mm. The shock wave traveled for 1.53 μs in the aluminum.

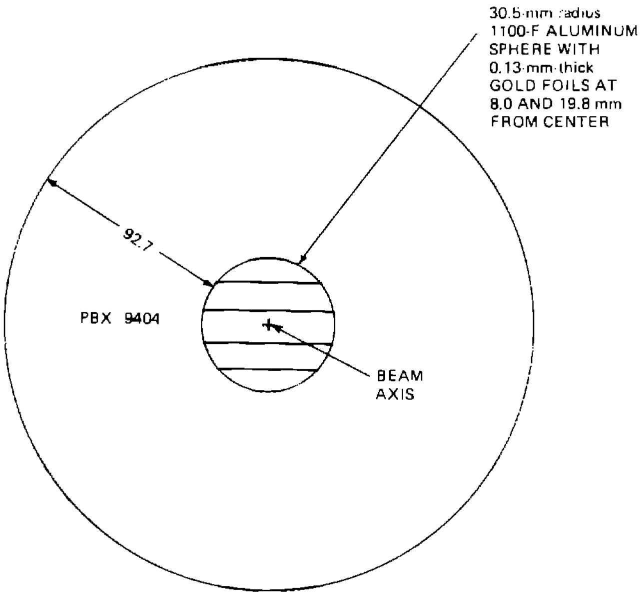


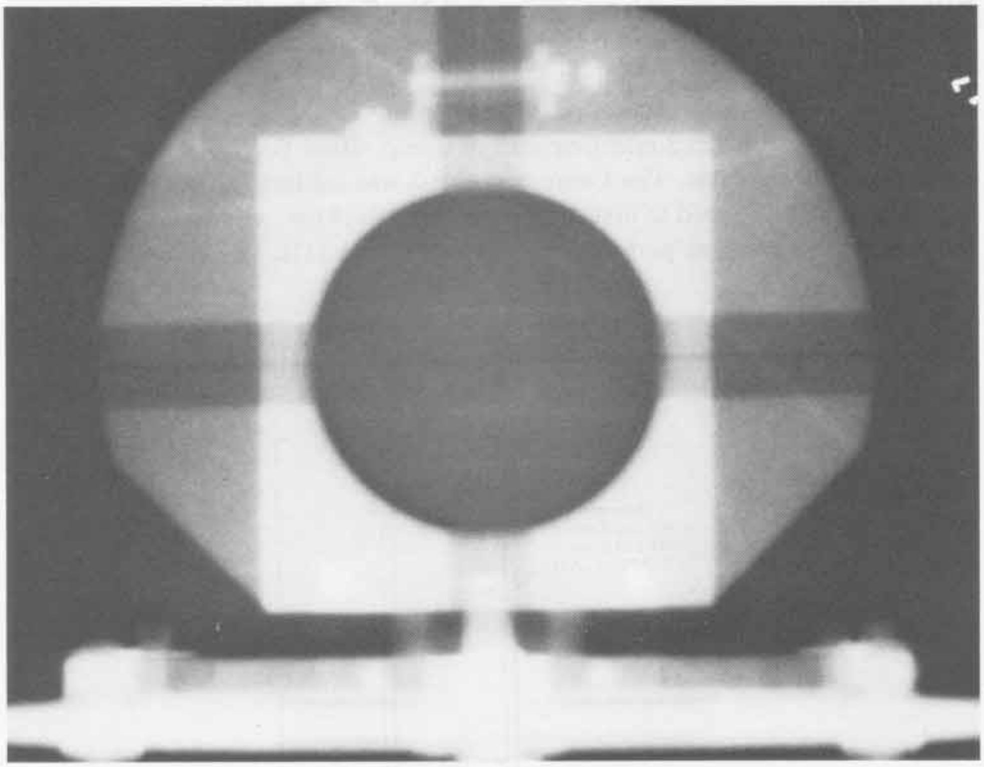


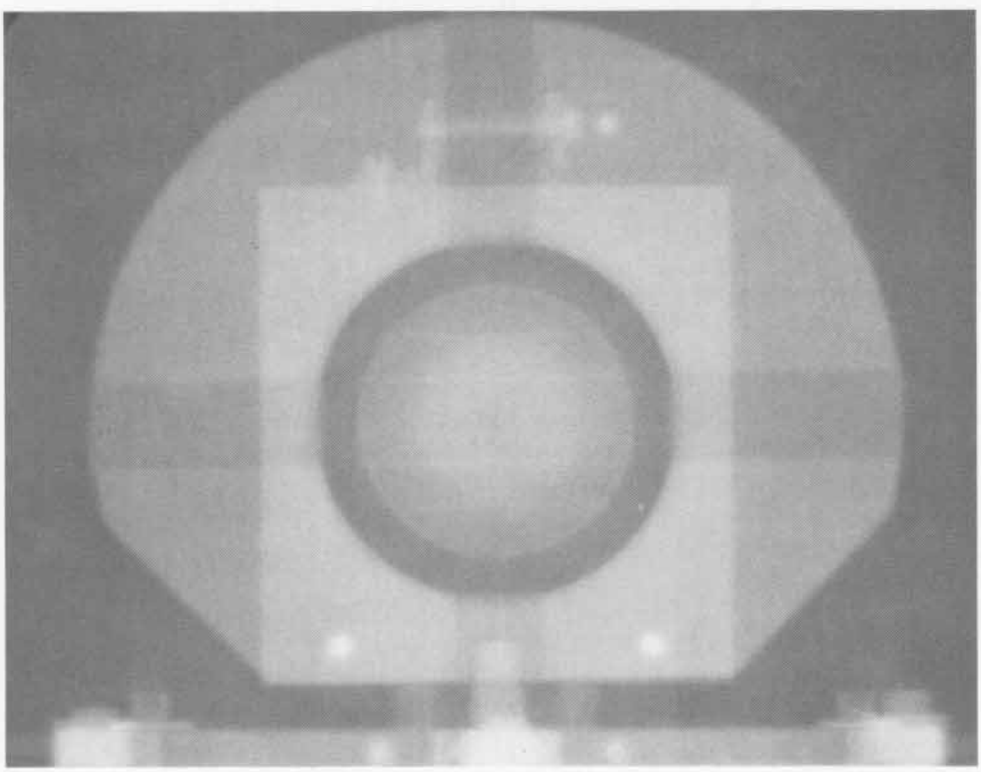


SHOT 1117: **Converging Aluminum Shock Wave**
Date: March 11, 1971
Experimenter: Reynaldo Morales
Radiographic Time: 28.74 μs
References: Mader and Craig, 1975; Mader, 1979

The shock wave was formed in a 30.48-mm sphere of 1100-F aluminum by a detonated surrounding sphere of 92.7-cm-thick PBX-9404. The radius of the reflected aluminum shock wave was 15.06 ± 0.14 mm and the PBX-9404/aluminum interface was 25.31 ± 0.12 mm. The shock wave traveled for 2.92 μs in the aluminum.







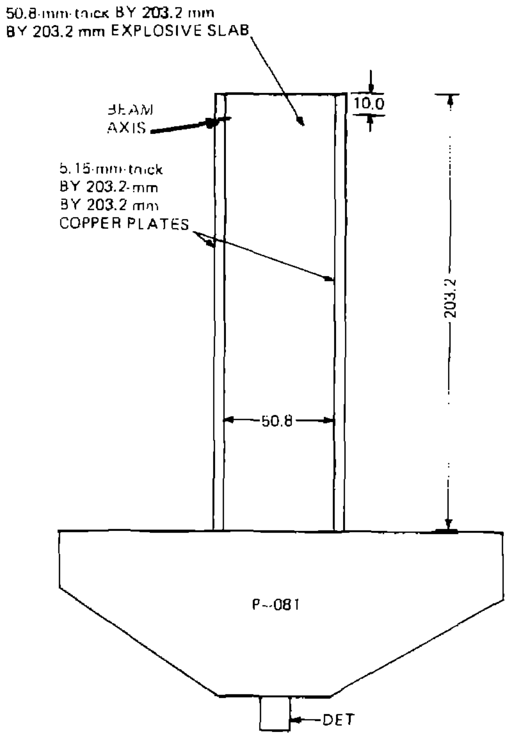
SHOT 1120: **Composition B-3 Confined by Copper**

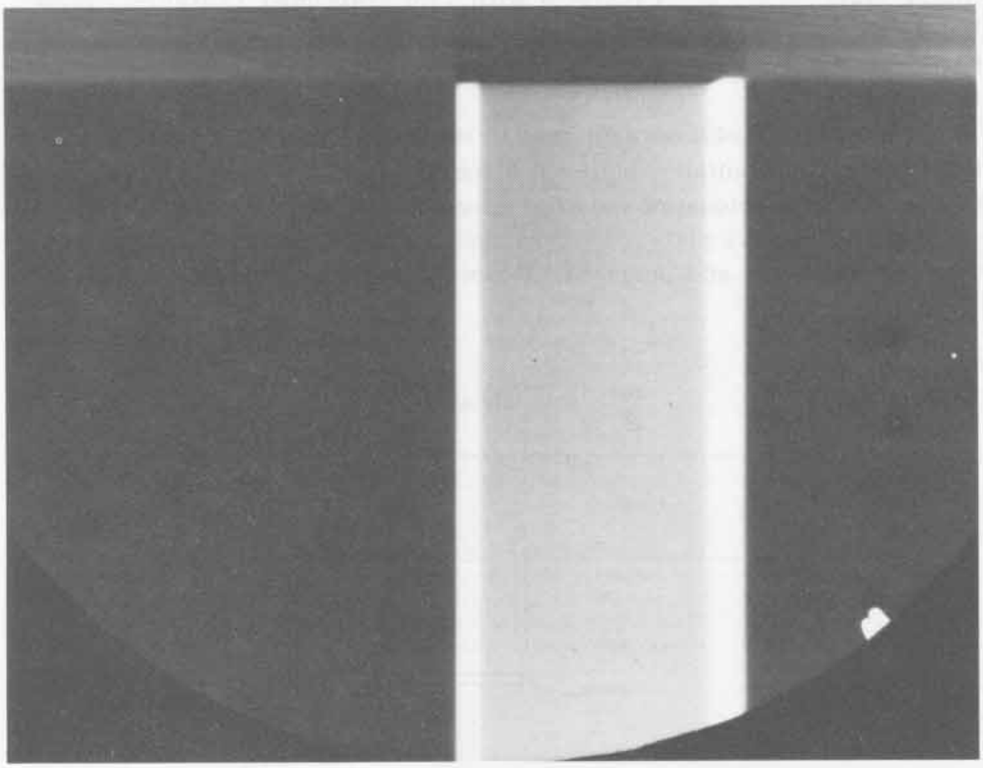
Date: June 18, 1969

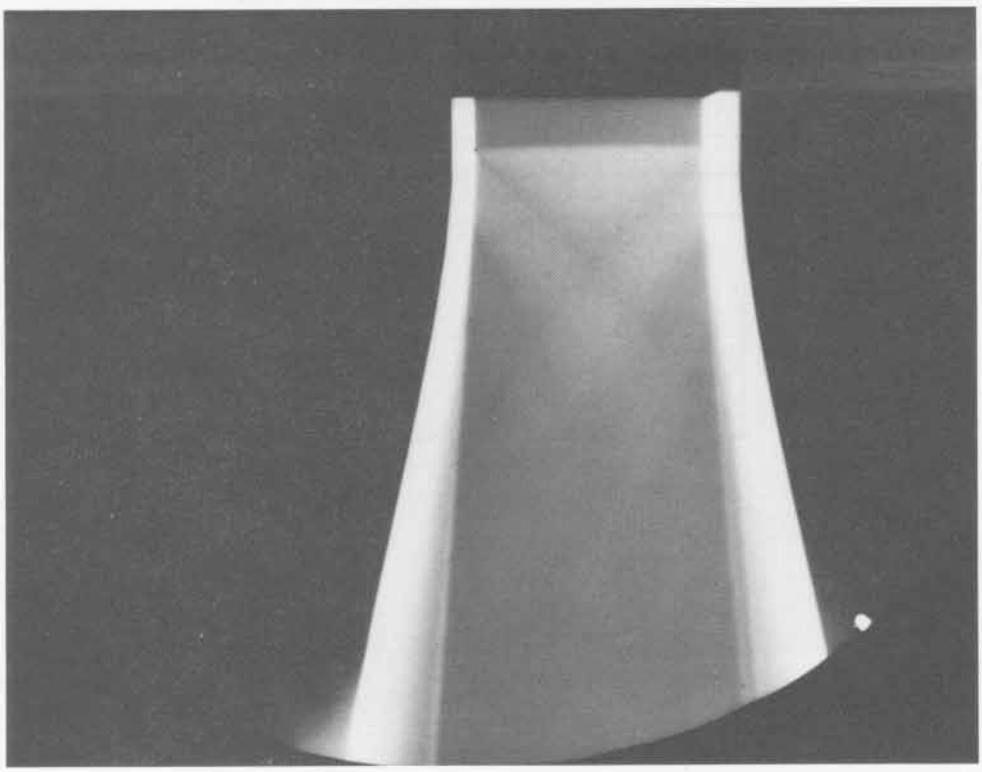
Experimenter: William C. Davis

Radiographic Time: 46.78 μs

A 50.8-mm-wide by 203.2-mm-long slab of Composition B-3 was confined by 5.15-mm-thick copper plates. The Composition B-3 was initiated by a P-081 lens. The experiment was designed to investigate the features of the cylinder test that is used for evaluating explosive performance. See also Shot 1112.

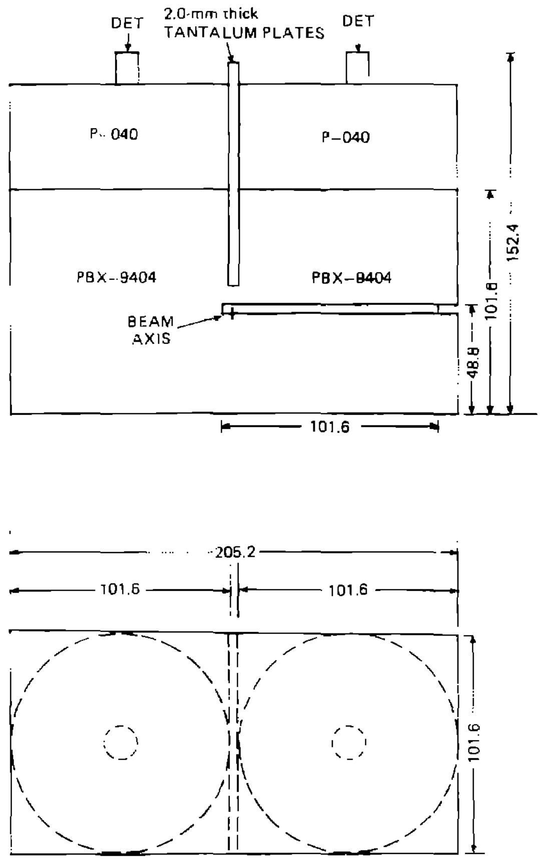


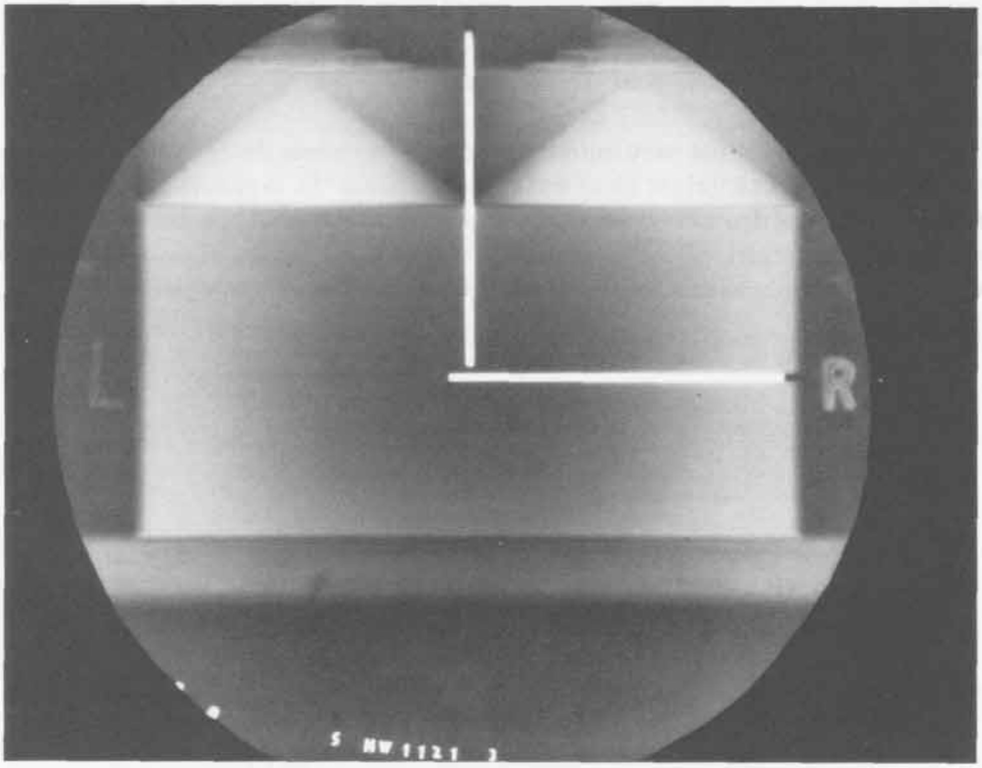


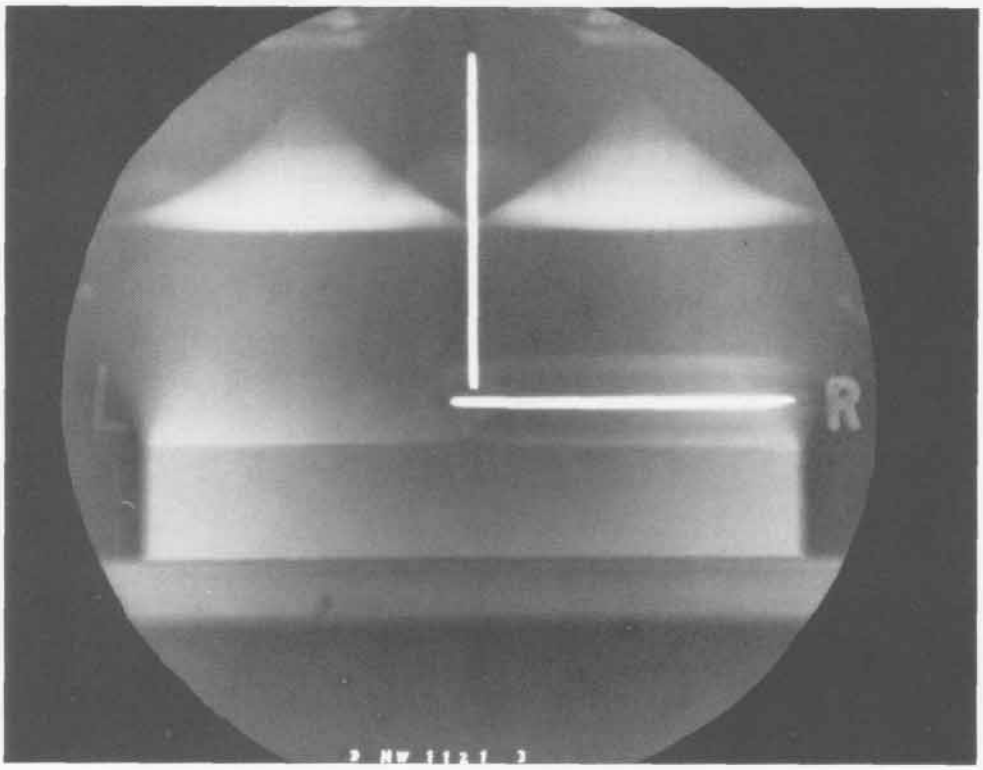


SHOT 1121: **PBX-9404 with Two Embedded Tantalum Plates**
Date: June 26, 1969
Experimenter: Gary W. Rodenz
Radiographic Time: 21.91 μs

Two blocks of PBX-9404 were initiated by two P-040 lenses detonated 0.4 μs apart. One 2.0-mm-thick tantalum plate was placed between the explosive blocks parallel to the direction of detonation wave travel for 48.8 mm and 2.0 mm below that plate another 2.0-mm-thick plate was perpendicular to the direction of detonation wave travel for 101.6 mm and projected 4.0 mm beyond the top plate.

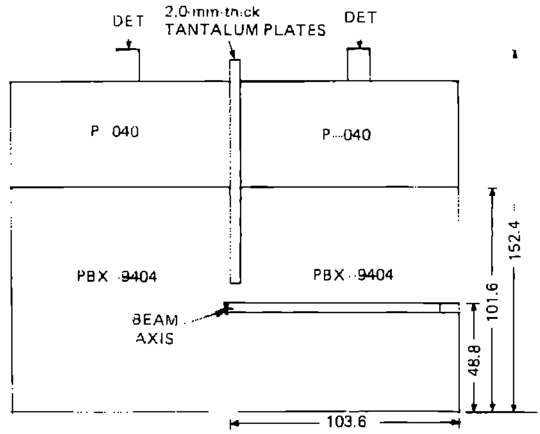


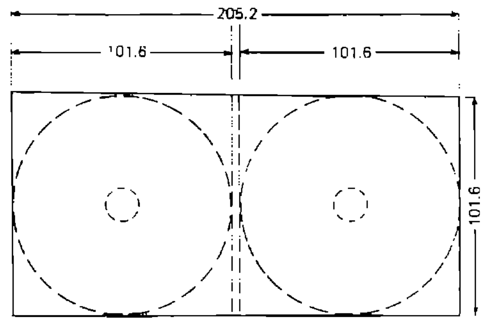

L
R

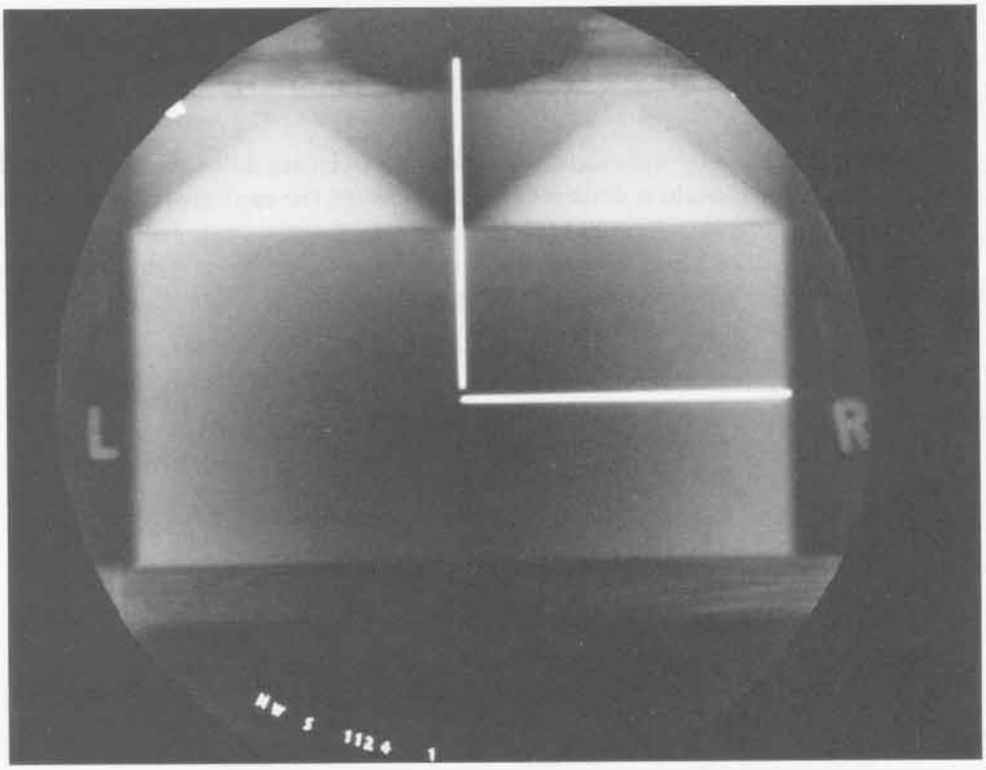

L
R

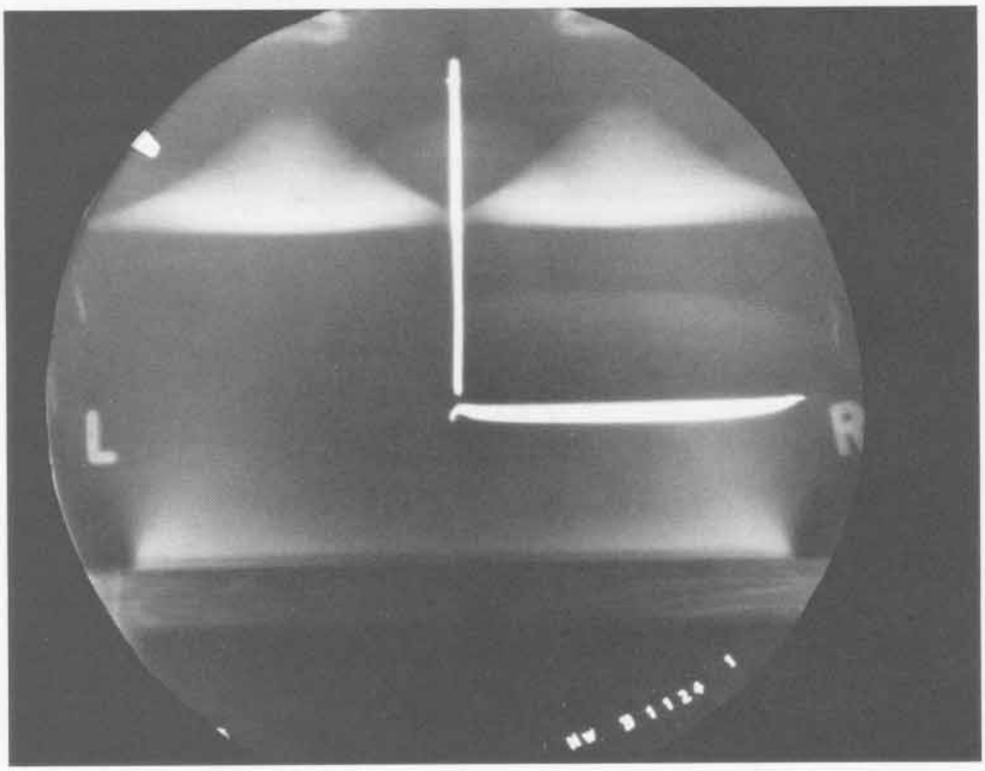
SHOT 1124: **PBX-9404 with Two Embedded Tantalum Plates**
Date: May 3, 1973
Experimenter: Gary W. Rodenz
Radiographic Time: 25.7 μs

Two blocks of PBX-9404 were initiated by two P-040 lenses detonated 0.4 μs apart. One 2.0-mm-thick tantalum plate was placed between the explosive blocks parallel to the direction of detonation wave travel for 48.8 mm and 2.0 mm below that plate another 2.0-mm-thick plate was perpendicular to the direction of detonation wave travel for 101.6 mm with a hemispherical end located below the top plate. See Shot 1126.






L
R


L
R

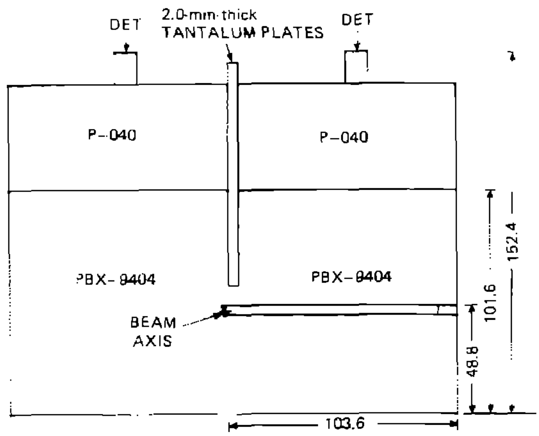
SHOT 1126: **PBX-9404 with Two Embedded Tantalum Plates**

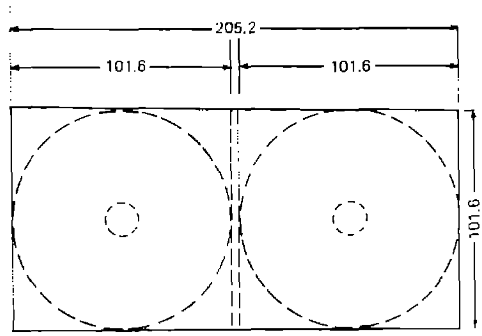
Date: May 17, 1973

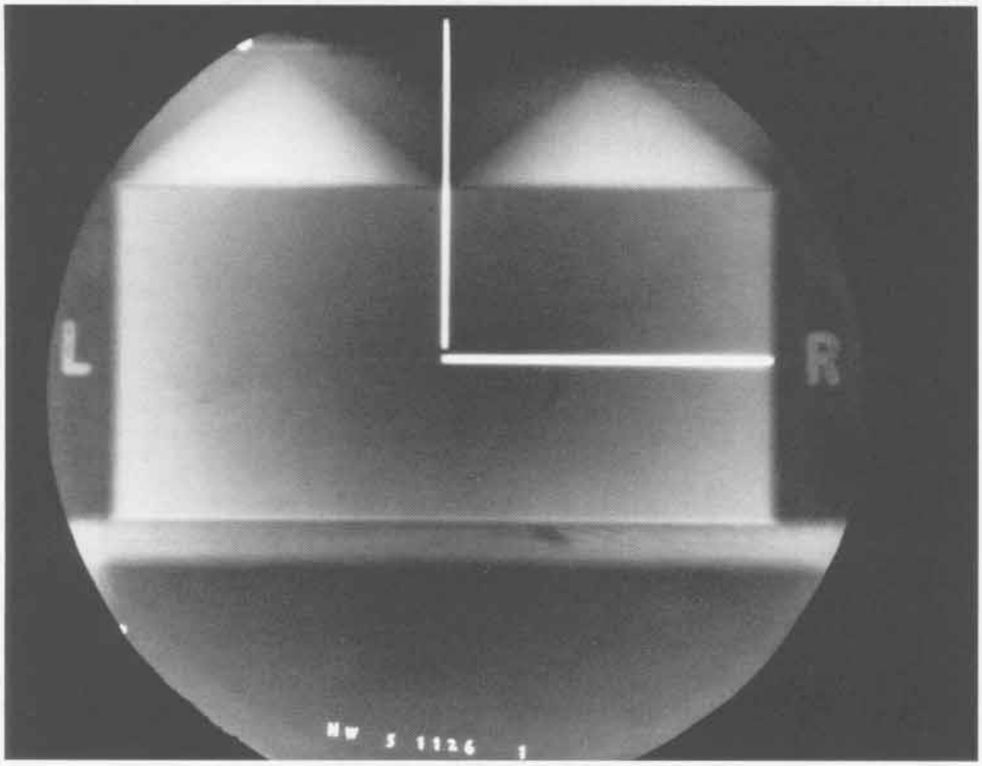
Experimenter: Gary W. Rodenz

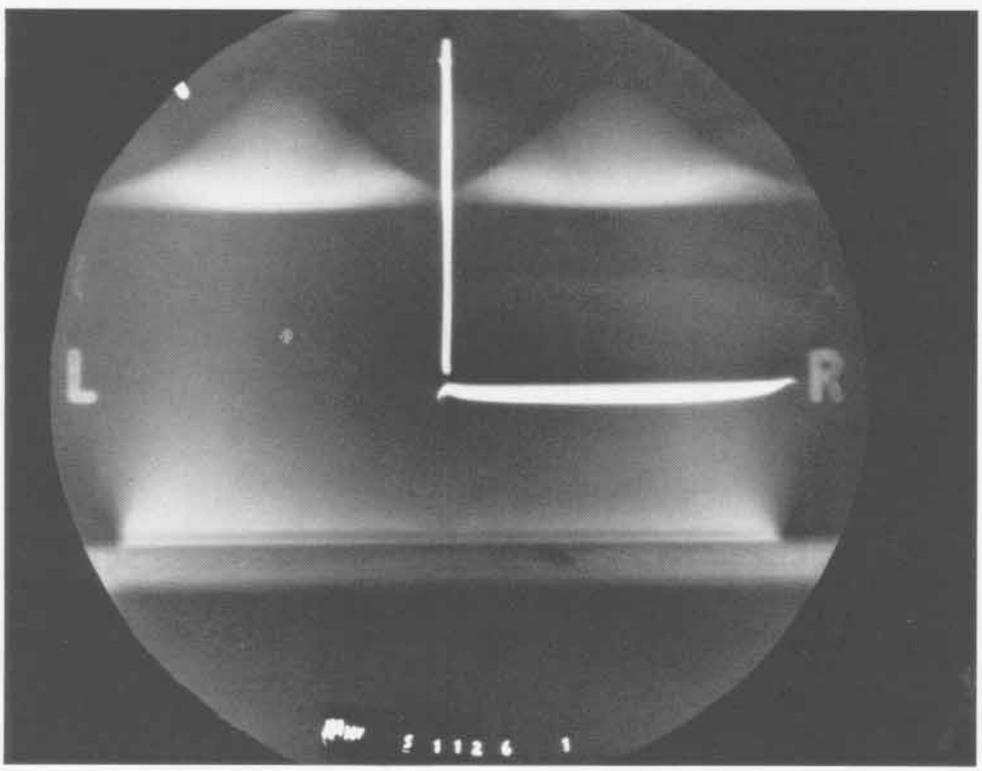
Radiographic Time: 25.7 μs

Two blocks of PBX-9404 were initiated by two P-040 lenses detonated 0.4 μs apart. One 2.0-mm-thick tantalum plate was placed between the explosive blocks parallel to the direction of detonation wave travel for 48.8 mm and 2.0 mm below that plate another 2.0-mm-thick plate was perpendicular to the direction of detonation wave travel for 101.6 mm with a square end located below the top plate. See Shot 1124.






L
R


L
R

SHOT 1130: **Colliding PBX-9404 Cylindrical Detonation Waves**

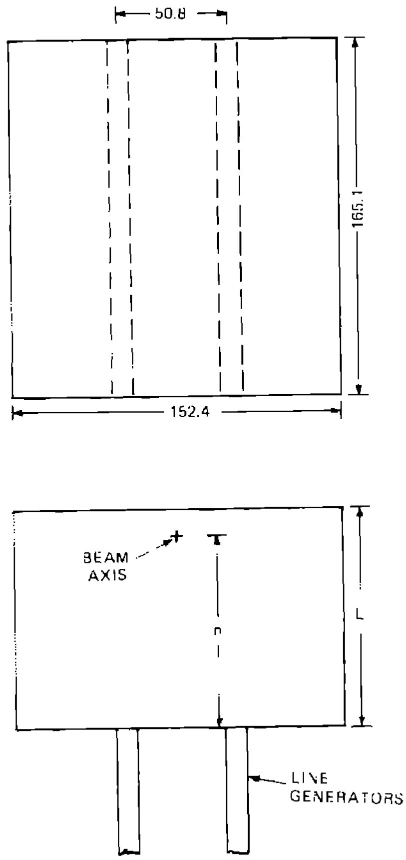
Date: August 26, 1969

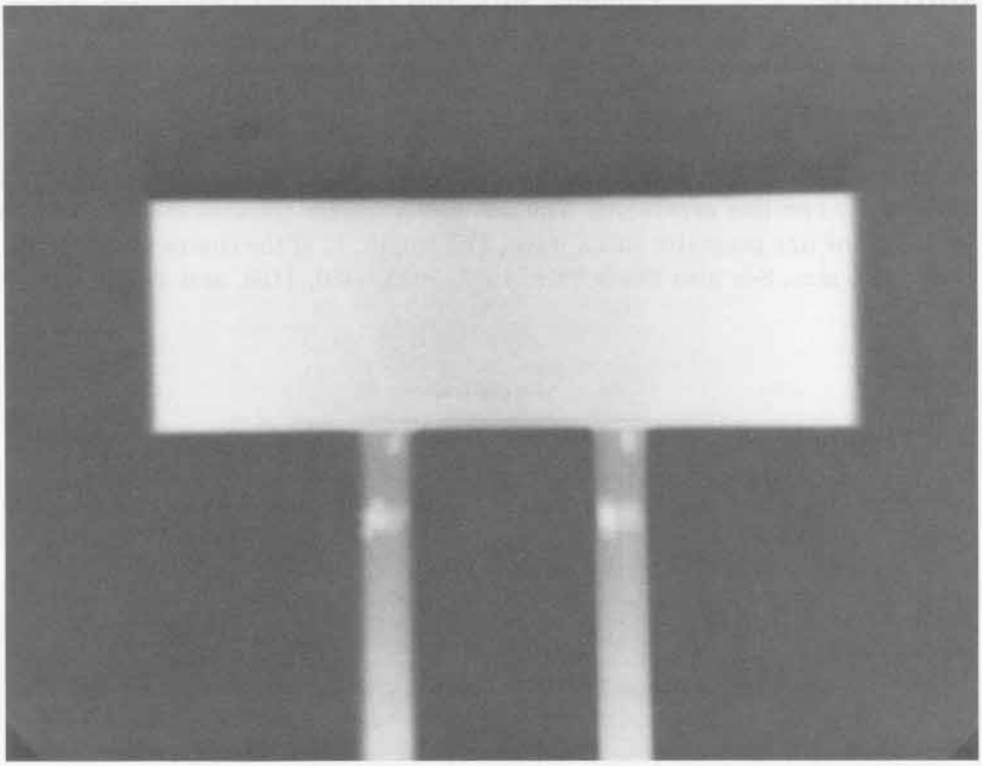
Experimenter: Douglas Venable

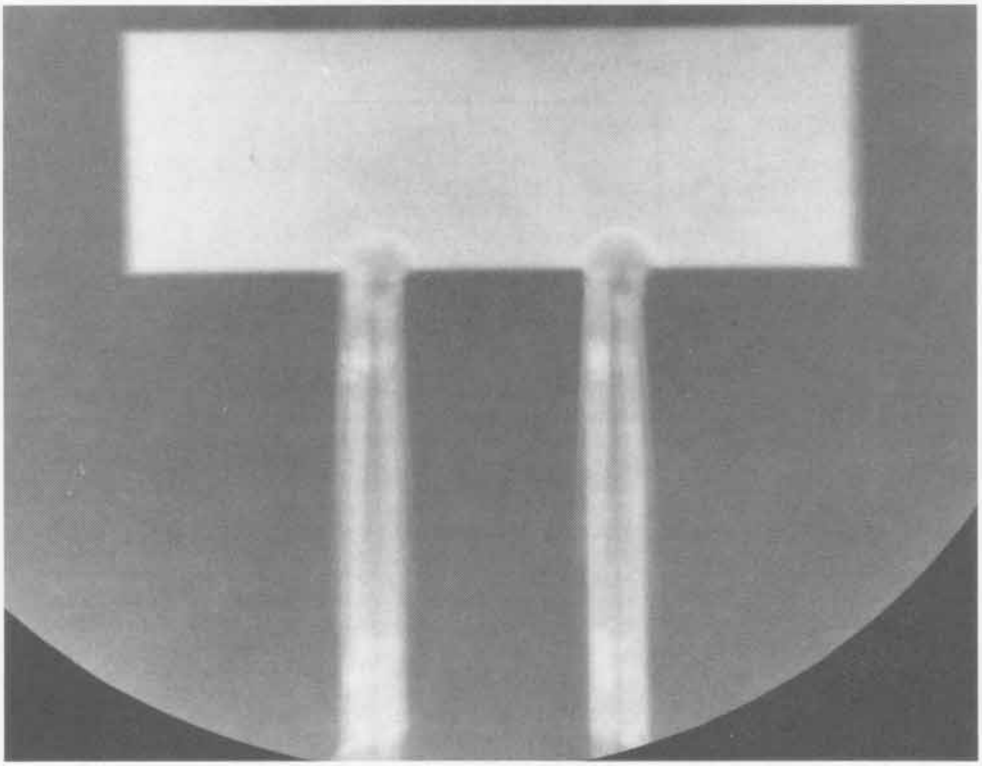
Radiographic Time: 22.36 μs

Reference: Mader and Venable, 1979

Two laterally colliding, diverging, cylindrical detonation waves in PBX-9404 were initiated by two line generators. The detonation waves traveled for 1.06 μs after arrival of the line generator shock wave. The length, L, of the charge was 50.8 mm. h was 25.4 mm. See also Shots 1019, 1037, 1038, 1143, 1159, and 1160.

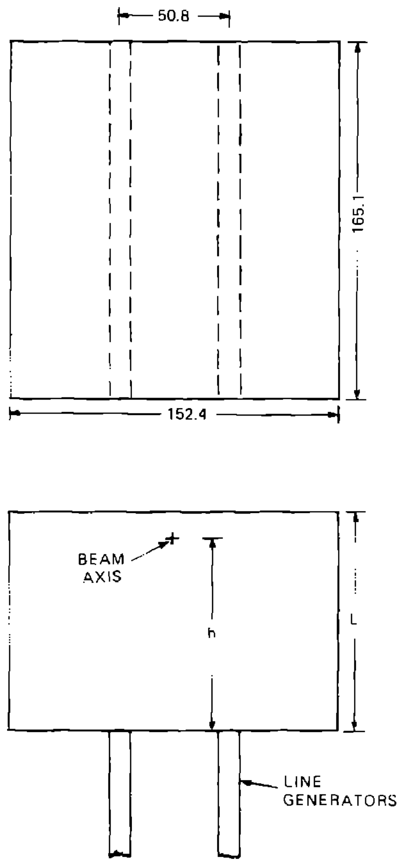


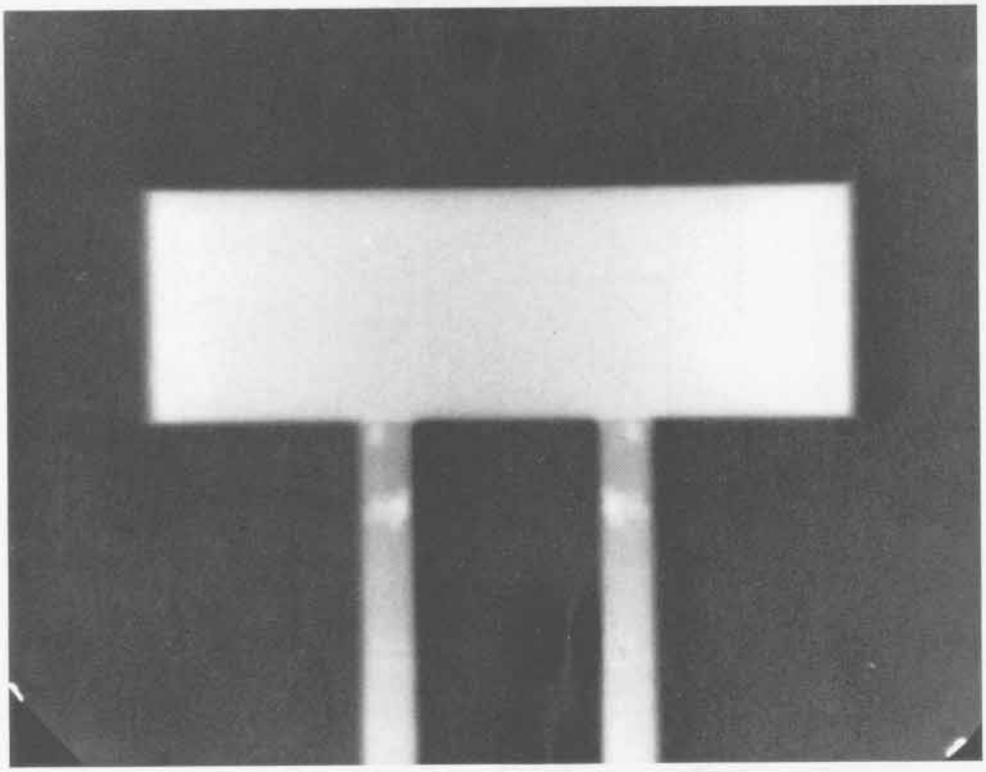


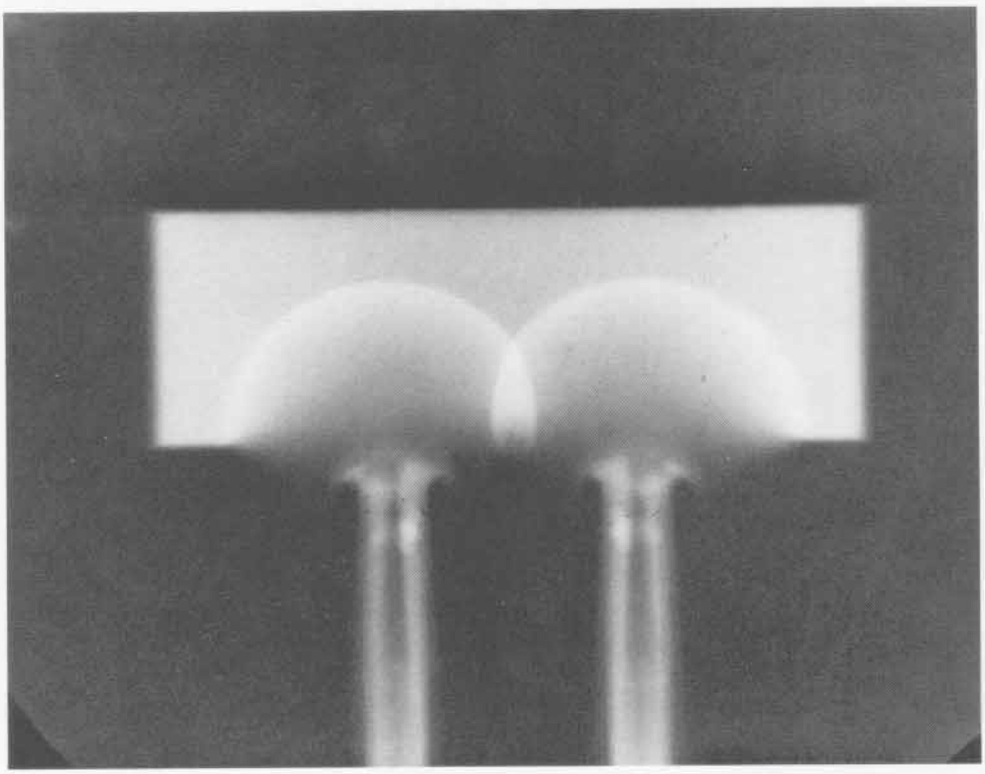


SHOT 1143: **Colliding PBX-9404 Cylindrical Detonation Waves**
Date: September 3, 1969
Experimenter: Douglas Venable
Radiographic Time: 25.33 μs
Reference: Mader and Venable, 1979

Two laterally colliding, diverging, cylindrical detonation waves in PBX-9404 were initiated by two line generators. The detonation waves traveled for 4.03 μs after arrival of the line generator shock wave. The length, L, of the charge was 50.8 mm. h was 25.4 mm. See also Shots 1019, 1037, 1038, 1130, 1159, and 1160.







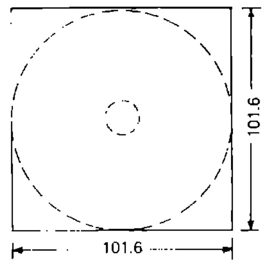
SHOT 1147: **Aluminum Flying Plate**

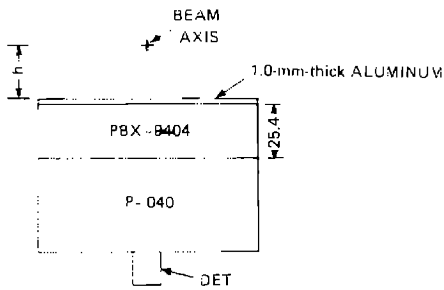
Date: June 16, 1970

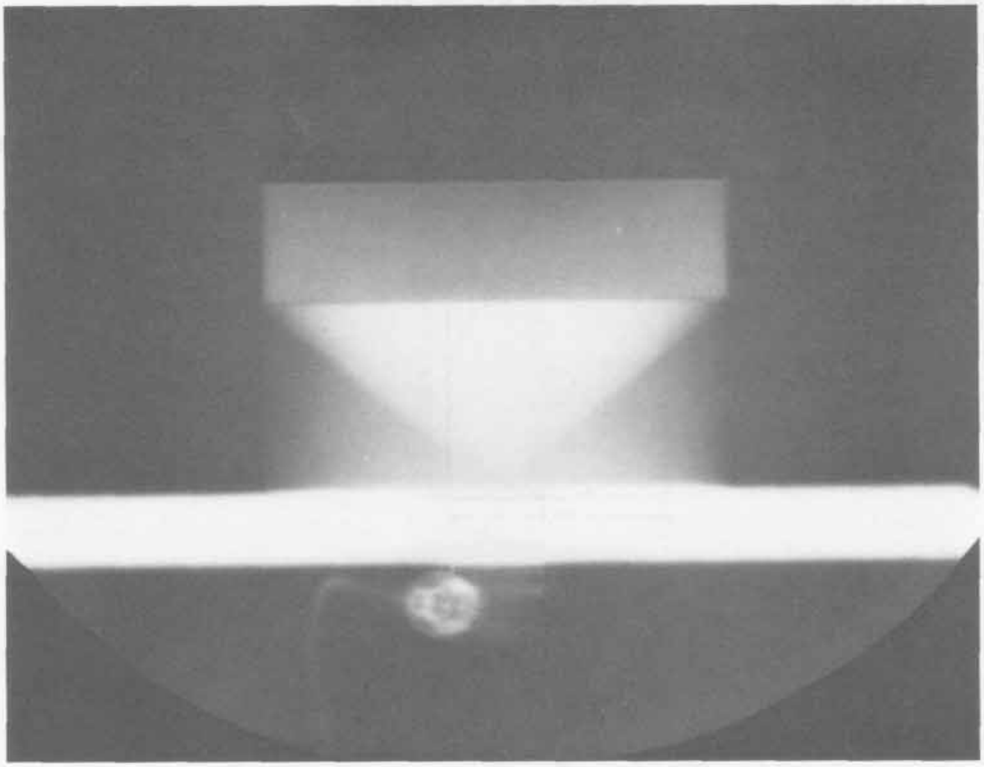
Experimenter: Douglas Venable

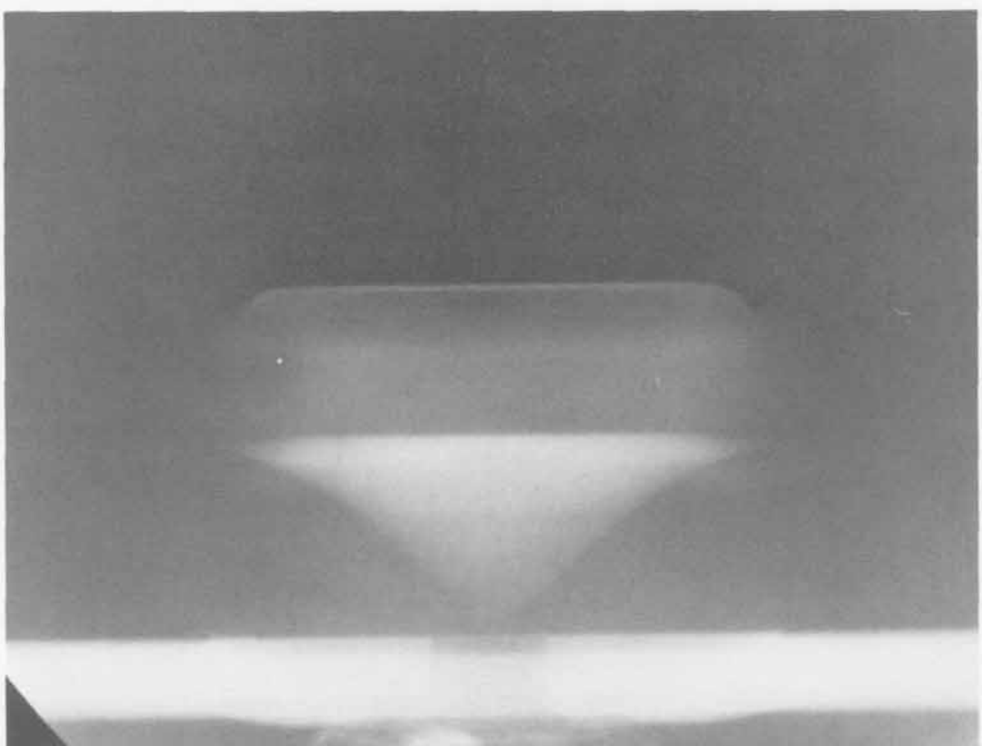
Radiographic Time: 18.22 μs

A 1.0-mm-thick aluminum plate was driven by 25.4 mm of PBX-9404 initiated by a P-040 lens. h was 12.7 mm.



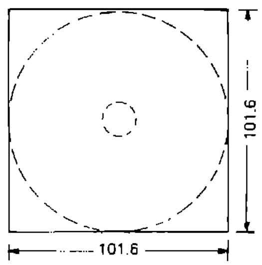


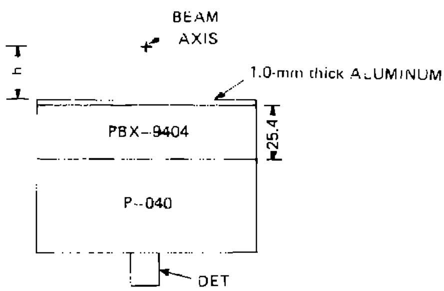


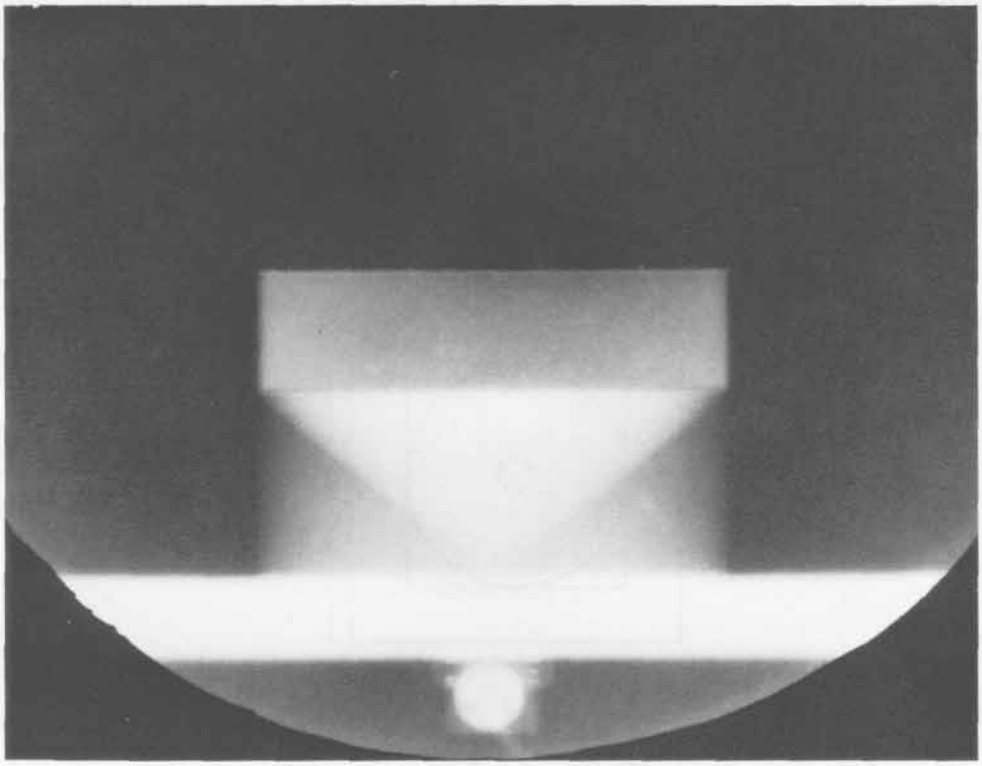


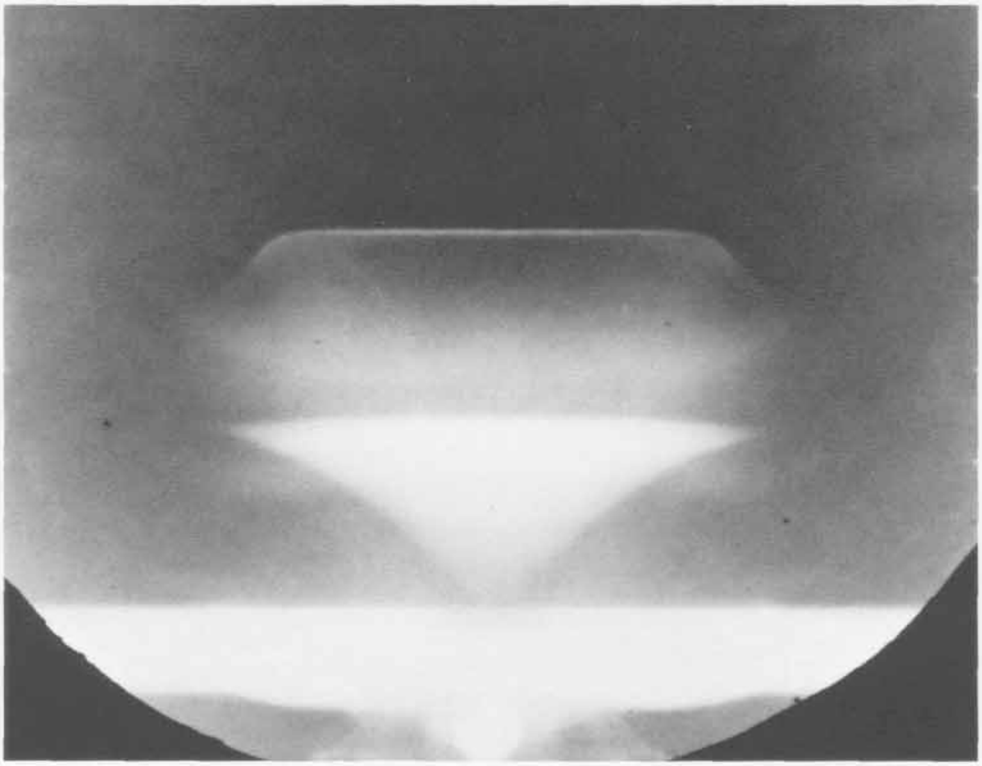
SHOT 1148: Aluminum Flying Plate
Date: August 5, 1970
Experimenter: Douglas Venable
Radiographic Time: 19.91 μs

A 1.0-mm-thick aluminum plate was driven by 25.4 mm of PBX-9404 initiated by a P-040 lens. h was 25.4 mm.



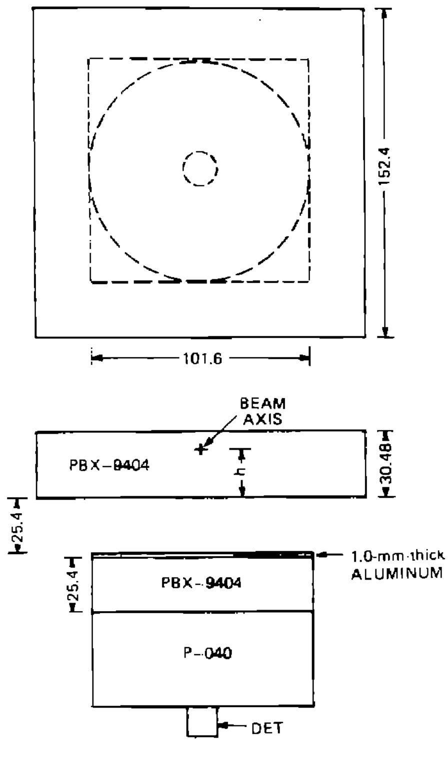


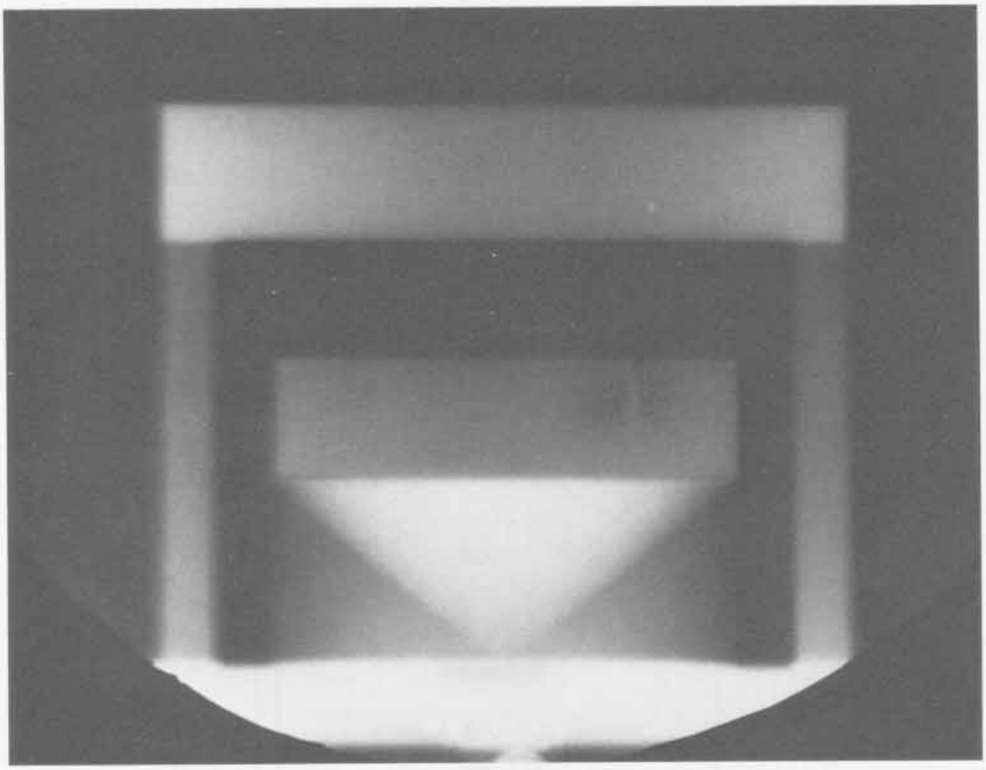


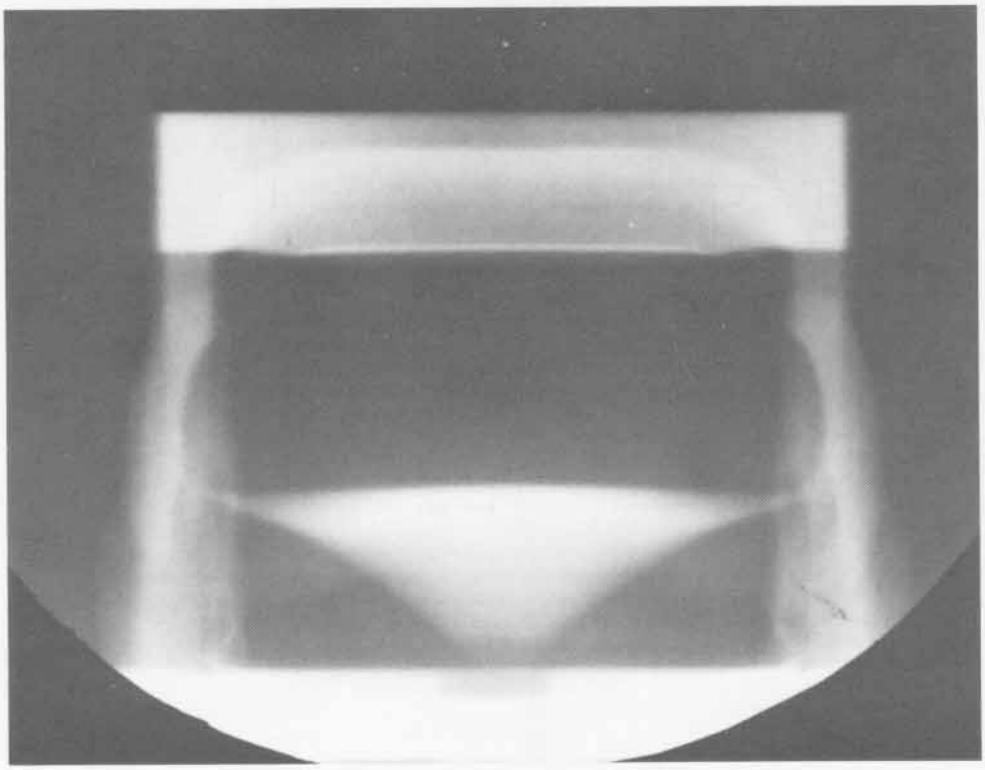


SHOT 1150: **Initiation of PBX-9404 by a Flying Aluminum Plate**
Date: August 12, 1970
Experimenter: Douglas Venable
Radiographic Time: 23.94 μs

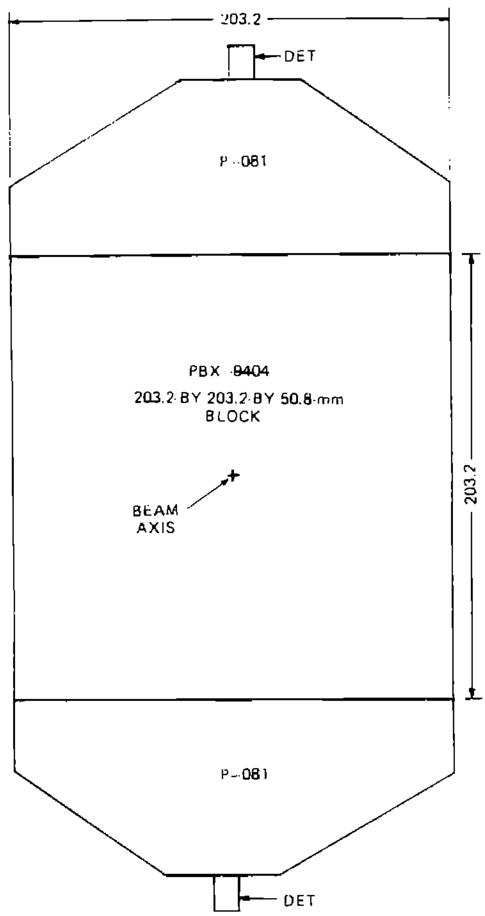
A 30.48-mm-thick block of PBX-9404 was initiated by a 1.0-mm-thick aluminum plate driven by 25.4 mm of PBX-9404, which was initiated by a P-040 lens. h was 22.25 mm.

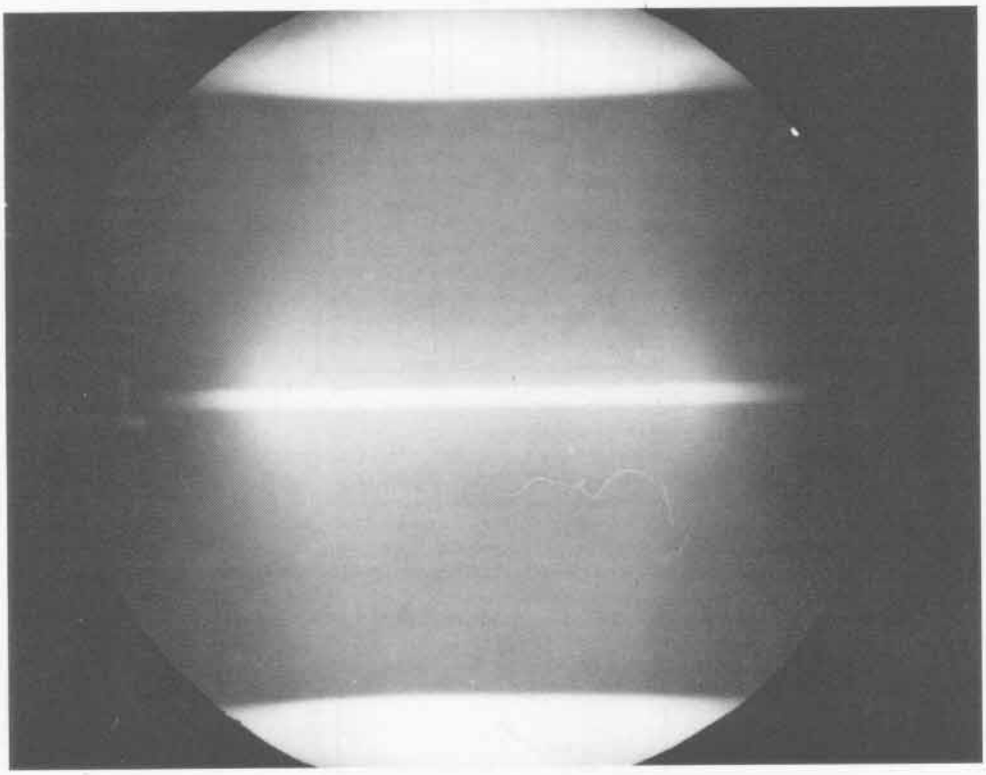






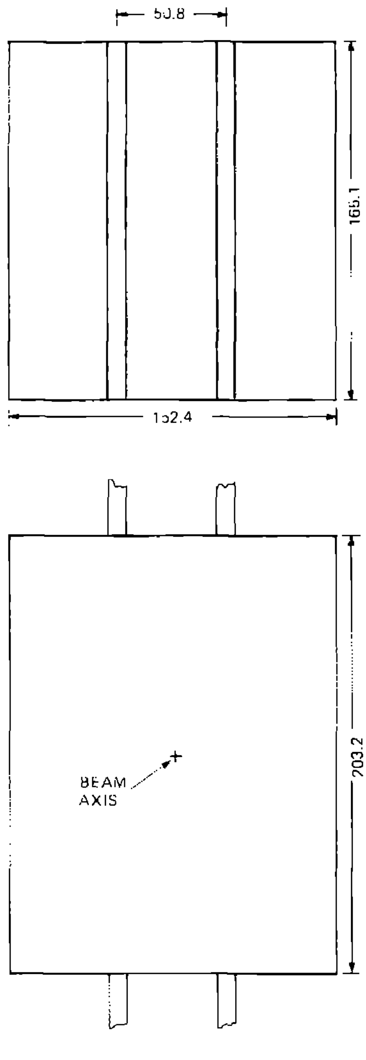
SHOT 1151: **Colliding PBX-9404 Detonations**
Date: June 16, 1970
Experimenter: Douglas Venable
Radiographic Time: 34.64 μs
The reflected shocks in PBX-9404 after the detonation waves collided. See Shots 207-210 and 292.

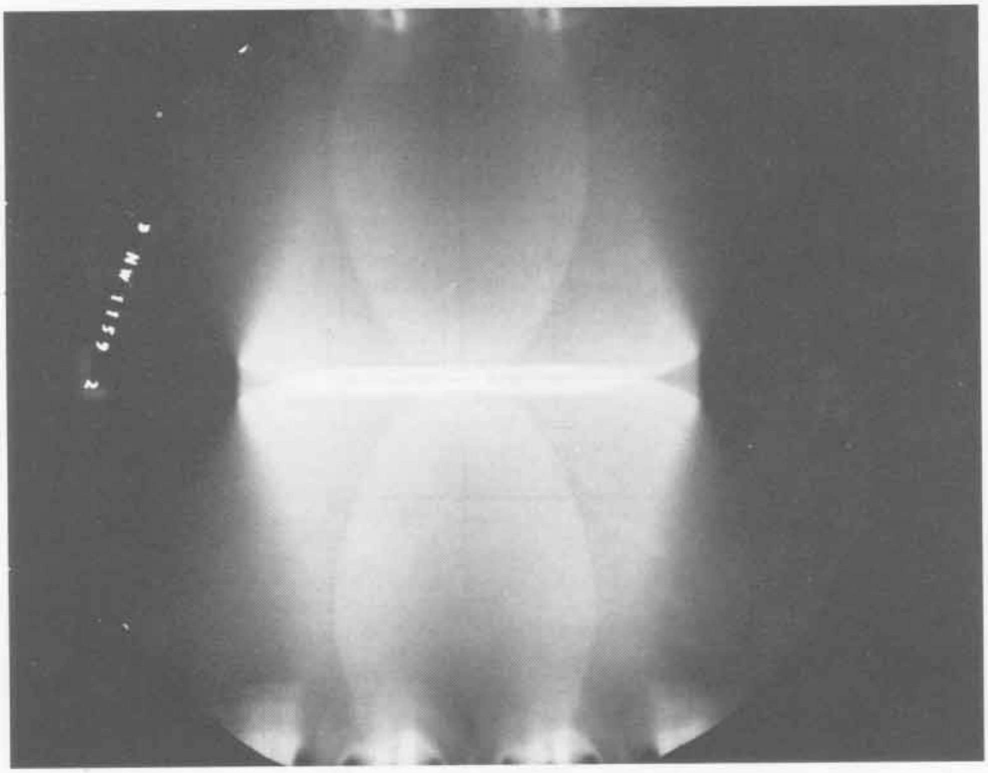




SHOT 1159: **Colliding PBX-9404 Mach Stems**
Date: June 18, 1970
Experimenter: Douglas Venable
Radiographic Time: 33.60 μs

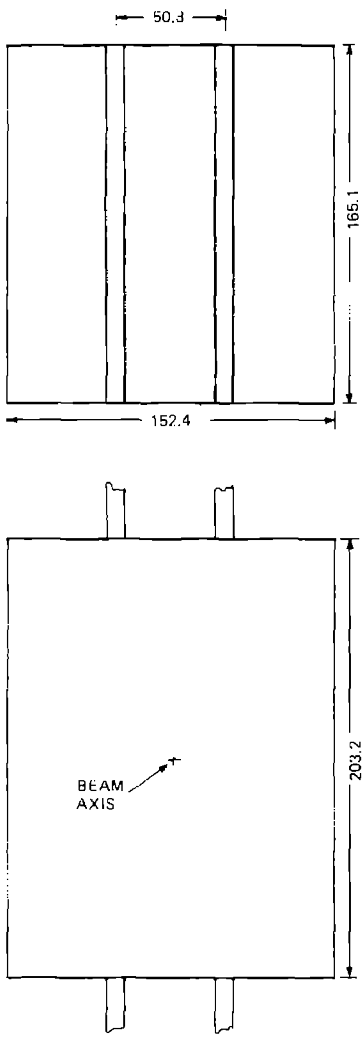
Two sets of laterally colliding, diverging, cylindrical detonation waves in PBX-9404 were initiated by two line generators and traveled 101.6 mm before colliding. The interaction of the Mach stems was shown. See also Shots 1037 and 1160.

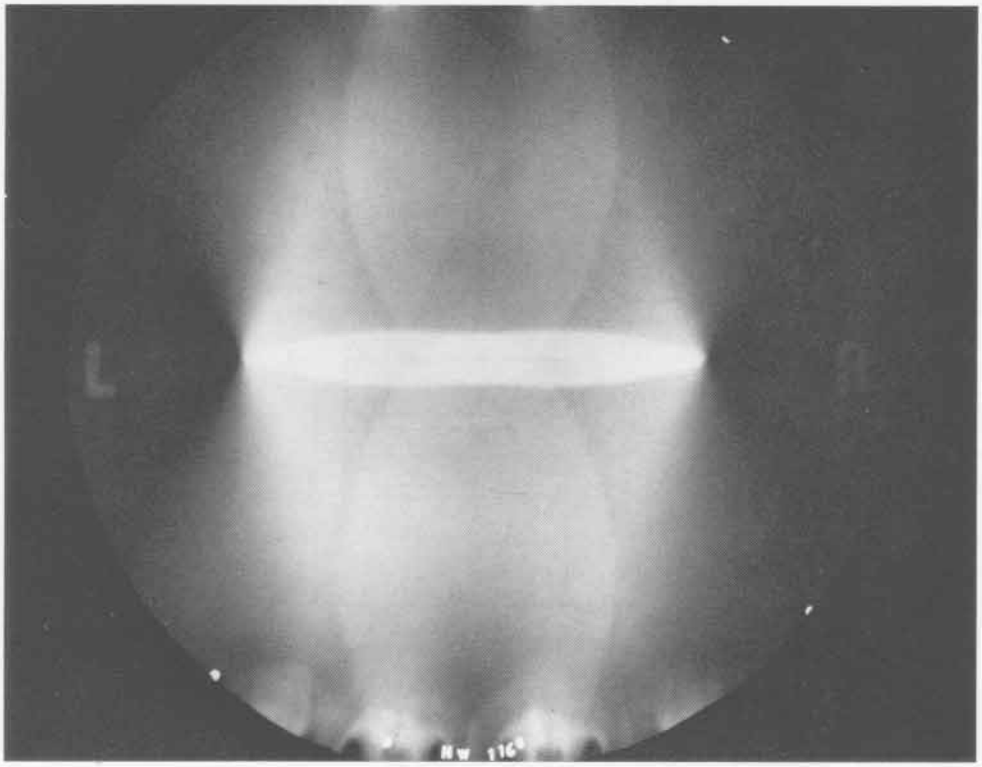




SHOT 1160: **Colliding PBX-9404 Mach Stems**
Date: June 30, 1970
Experimenter: Douglas Venable
Radiographic Time: 34.36 μs

Two sets of laterally colliding, diverging, cylindrical detonation waves in PBX-9404 were initiated by two line generators and traveled 101.6 mm before colliding. The interaction of the Mach stems was shown. See also Shots 1037 and 1159.




L
R
NW 116°

SHOT 1161: **PBX-9404 with Embedded Tantalum Foils**

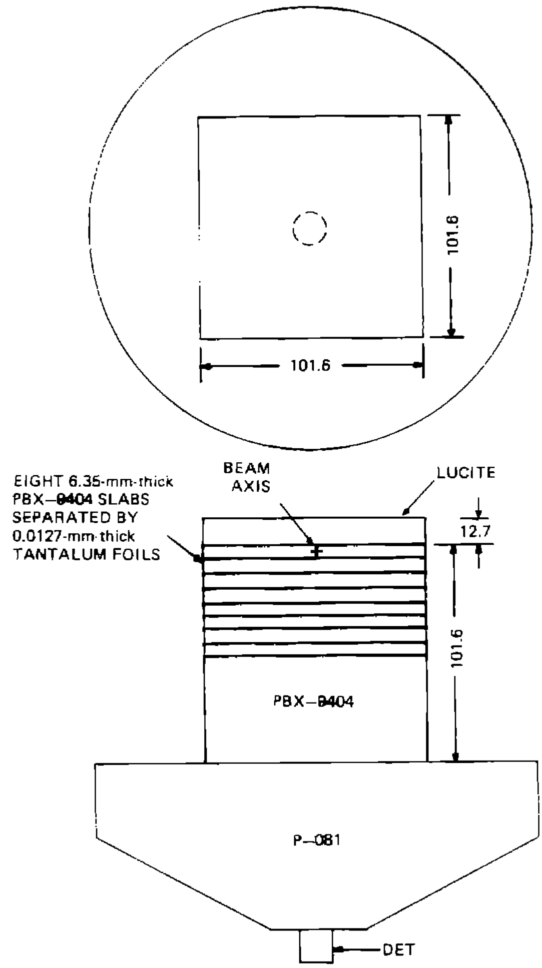
Date: June 17, 1970

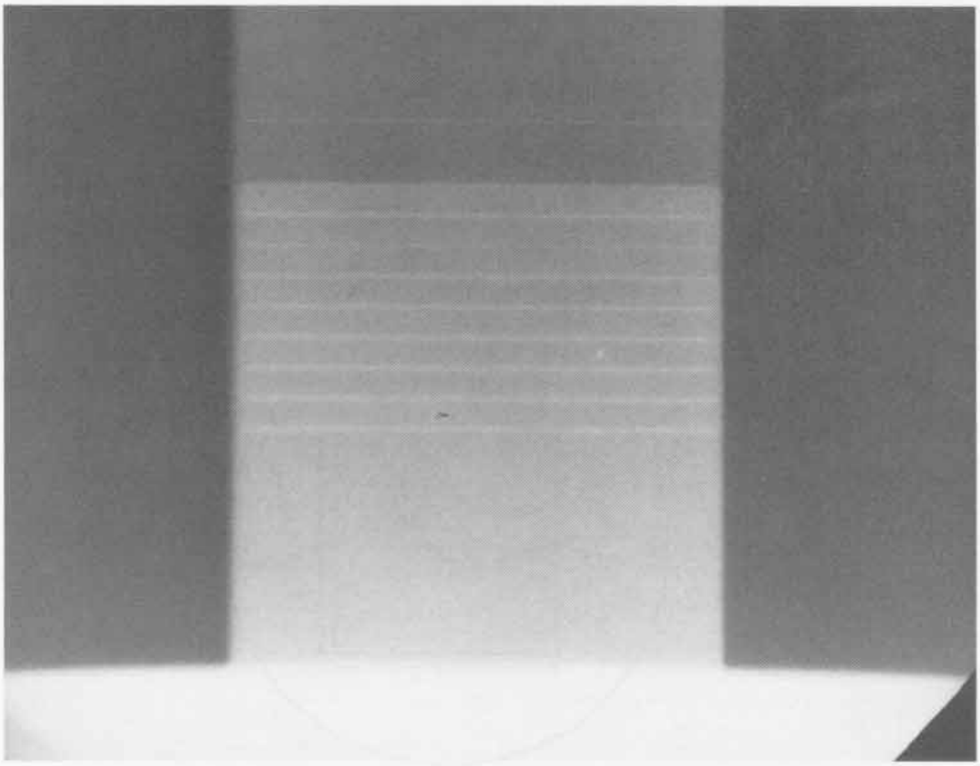
Experimenter: Douglas Venable

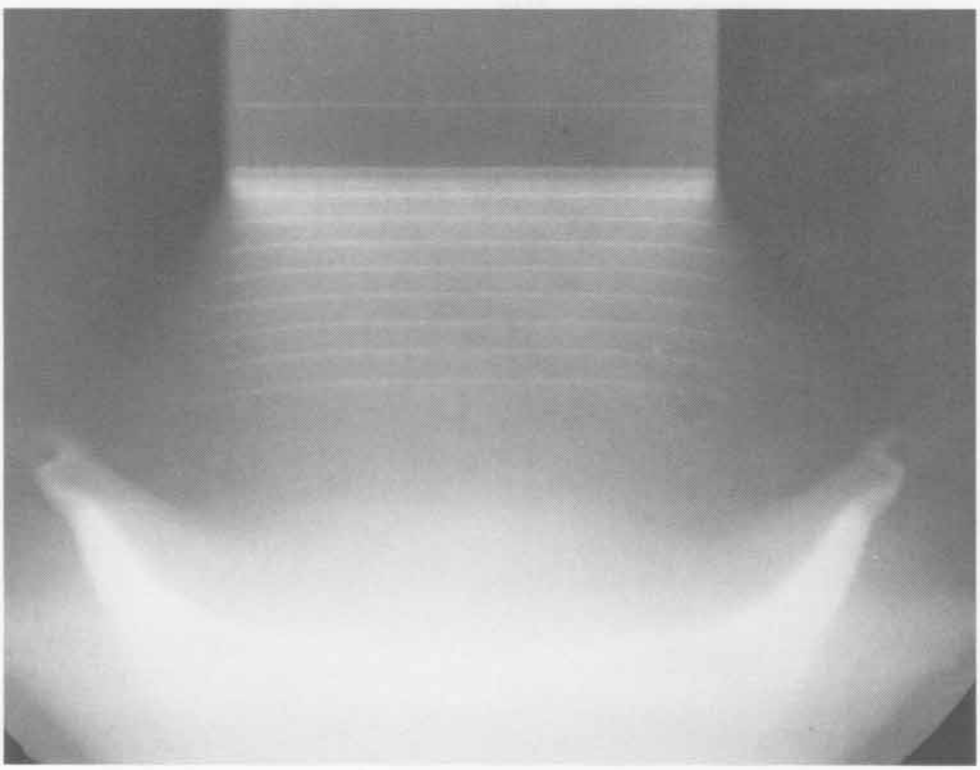
Radiographic Time: 33.87 μs

References: Mader and Craig, 1975; Mader, 1979

Eight slabs of 6.35-mm-thick PBX-9404 separated by 0.0127-mm-thick tantalum foils were initiated by 50.8 mm of PBX-9404 and a P-081 lens.

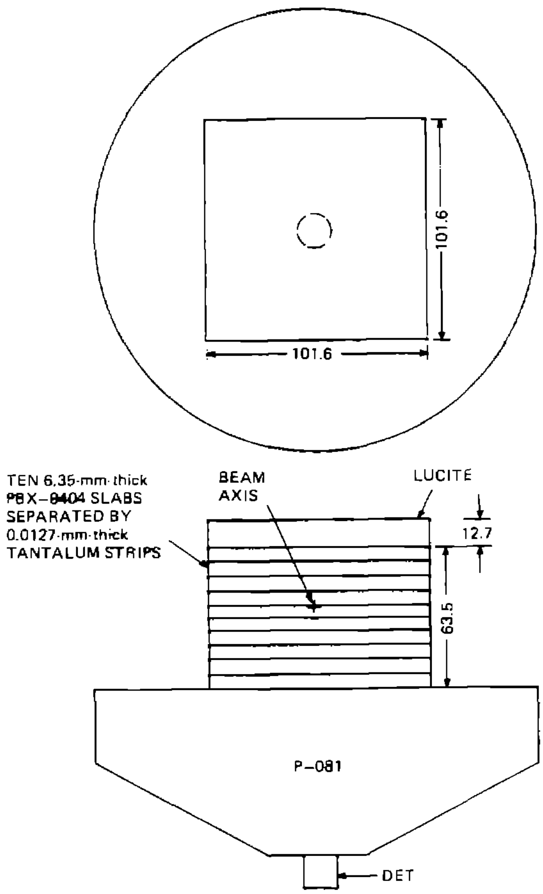


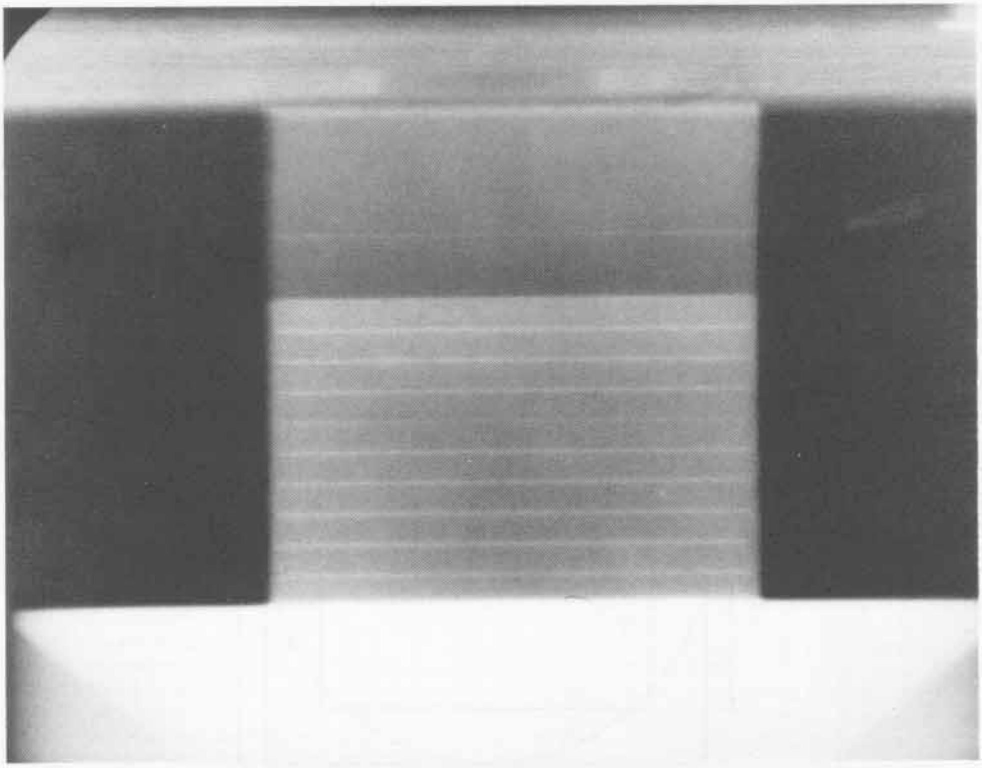


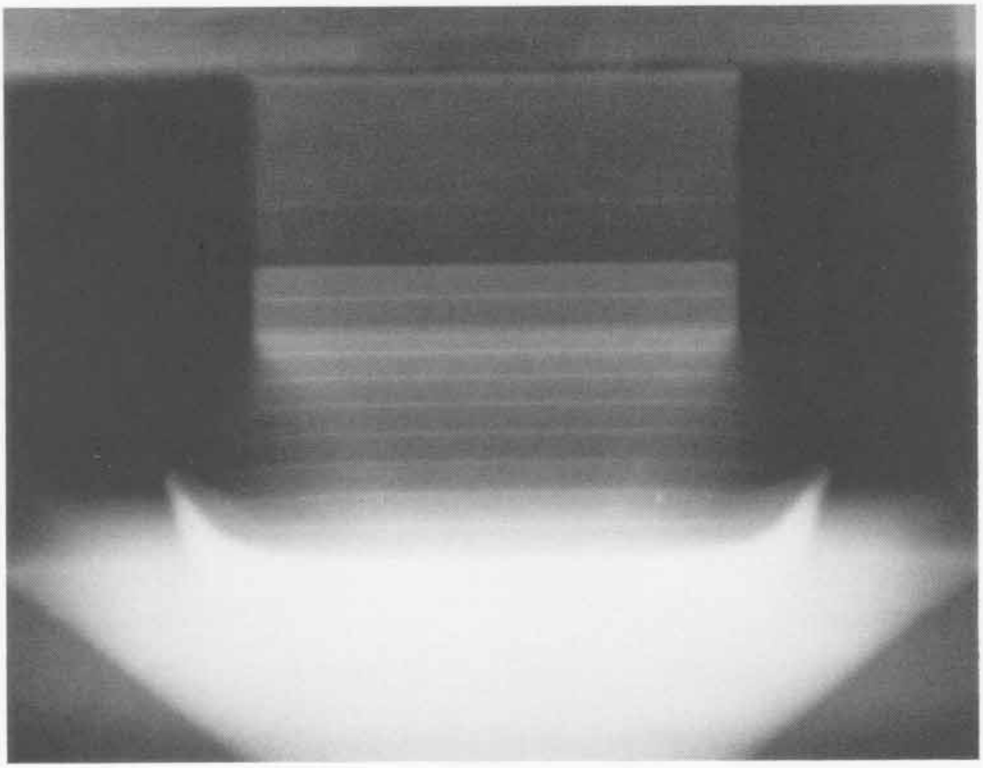


SHOT 1162: **PBX-9404 with Embedded Tantalum Foils**
Date: July 30, 1970
Experimenter: Douglas Venable
Radiographic Time: 28.36 μs
References: Mader and Craig, 1975; Mader, 1979

Ten slabs of 6.35-mm-thick PBX-9404 separated by 0.0127-mm-thick tantalum foils were initiated by a P-081 lens.

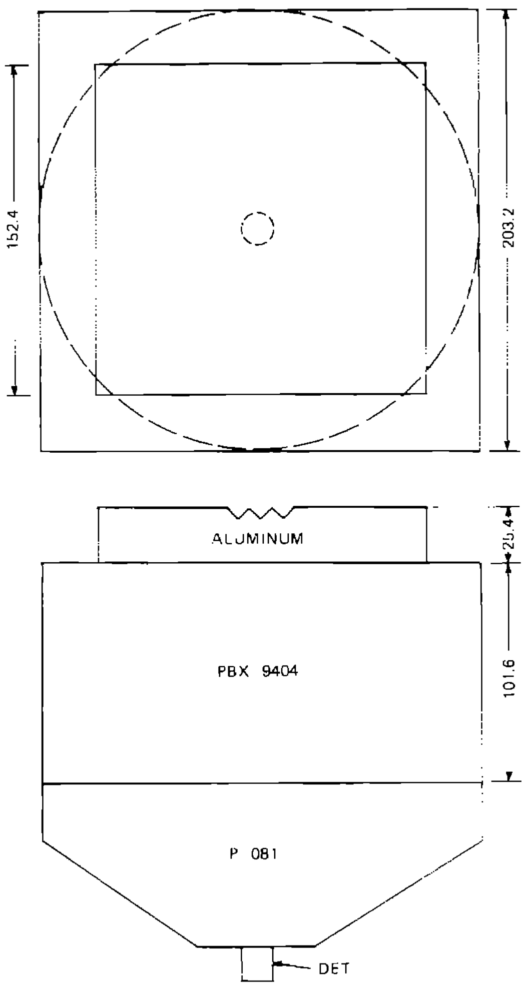


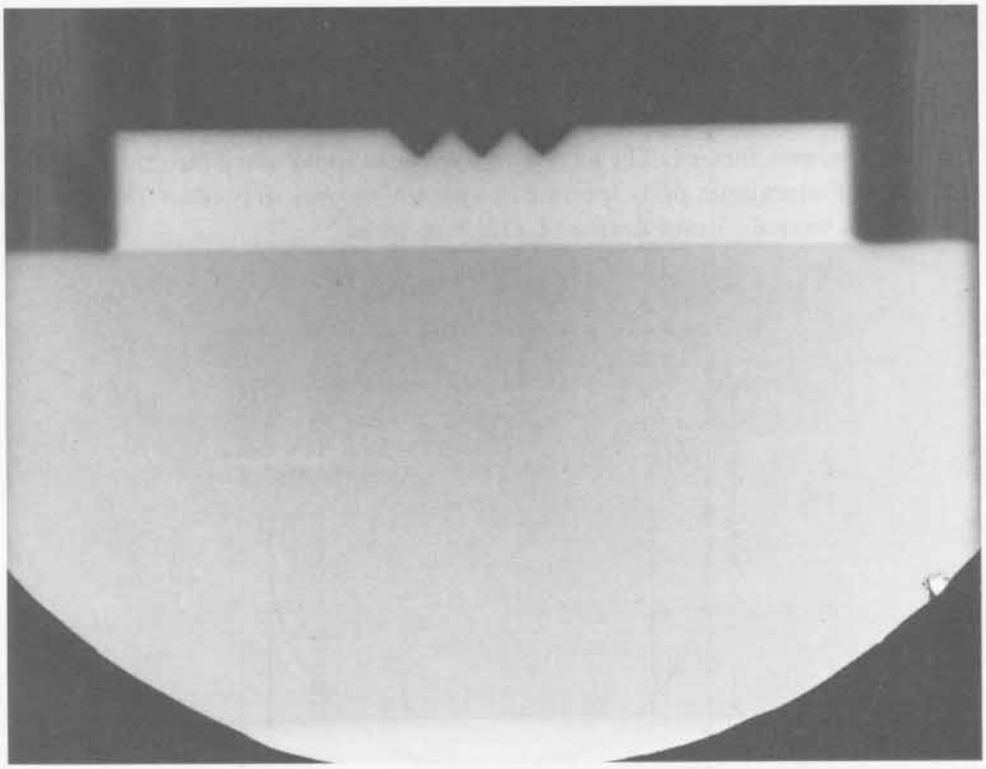


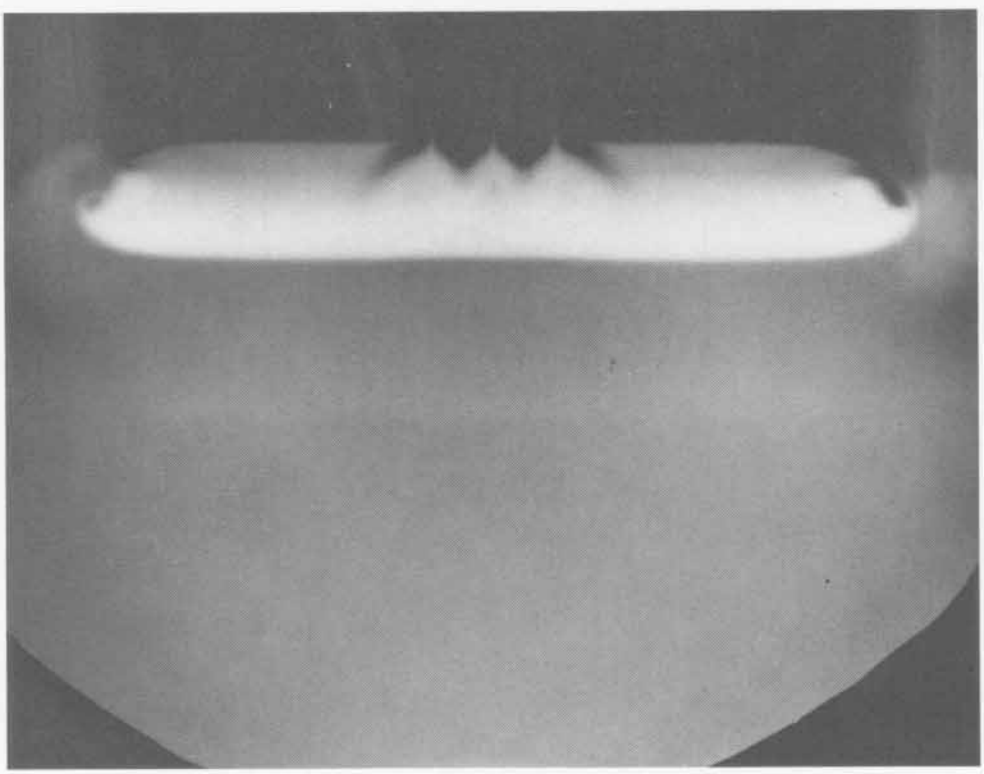


SHOT 1163: **Aluminum Jets**
Date: July 30, 1970
Experimenter: Douglas Venable
Radiographic Time: 39.67 μs

Metallic jets were formed. The explosively induced shock wave into the 25.4-mm-thick 1100-F aluminum plate interacted with the grooves to produce the jets. The 90° grooves were 6.35 mm deep and 12.7 mm wide.

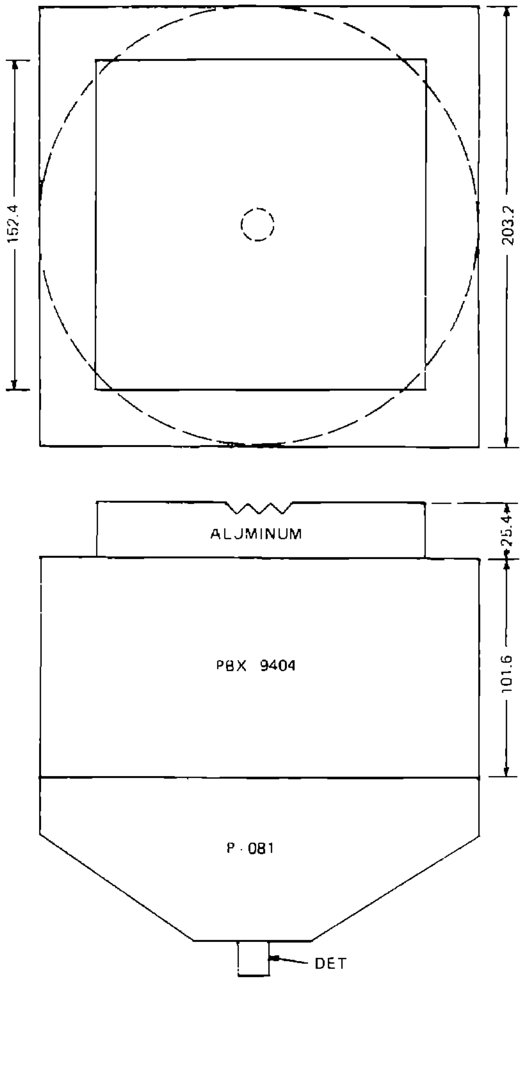


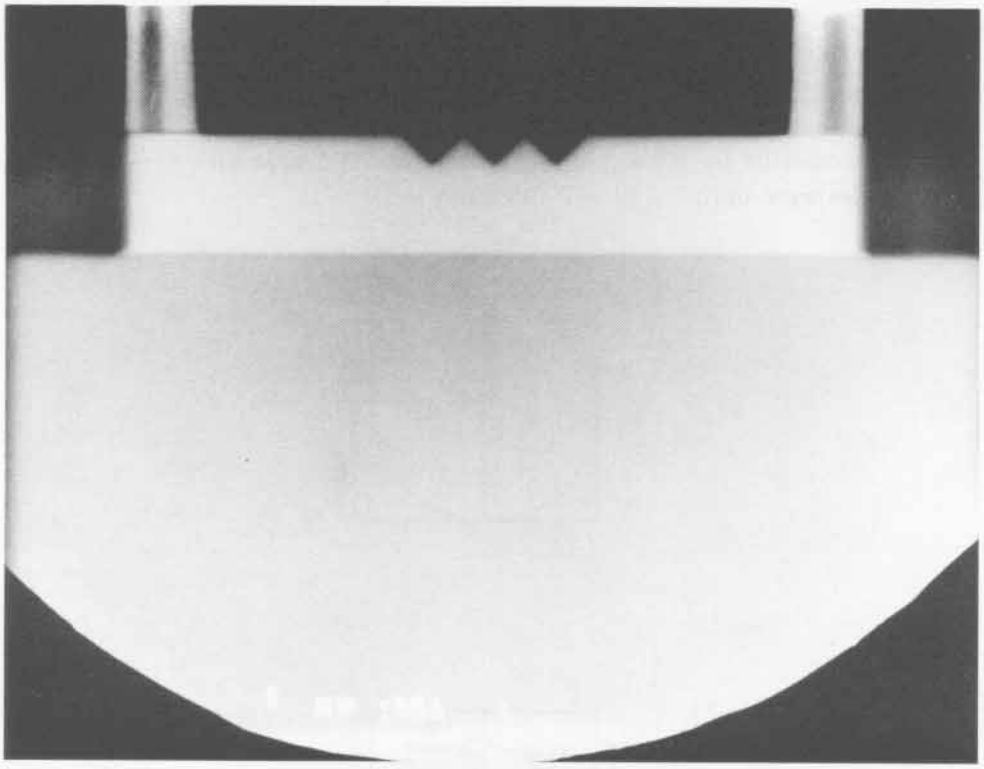


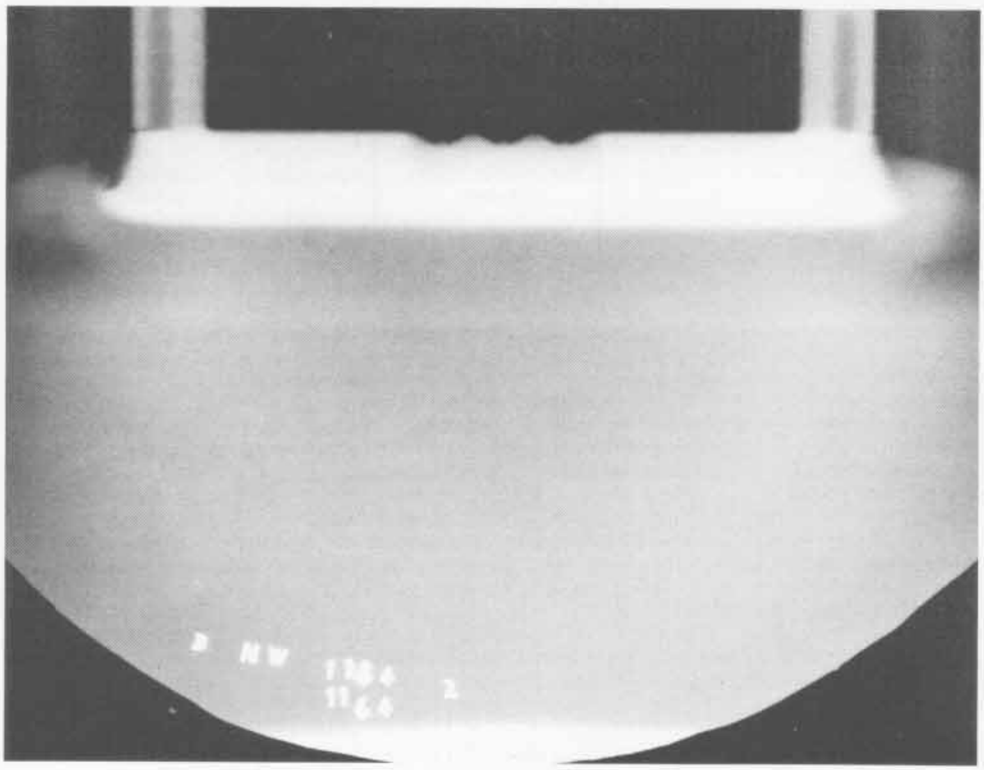


SHOT 1164: **Aluminum Jets**
Date: August 12, 1970
Experimenter: Douglas Venable
Radiographic Time: 37.6 μs

Metallic jets were formed. The explosively induced shock wave into the 25.4-mm-thick 1100-F aluminum plate interacted with the grooves to produce the jets. The 90° grooves were 6.35 mm deep and 12.7 mm wide.

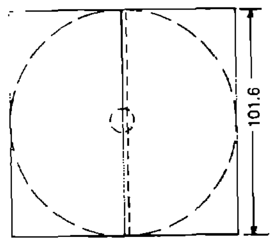


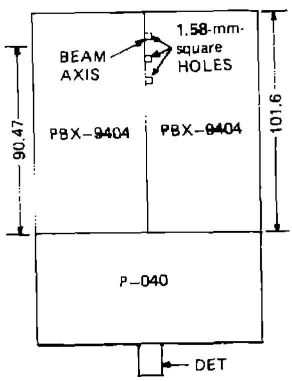


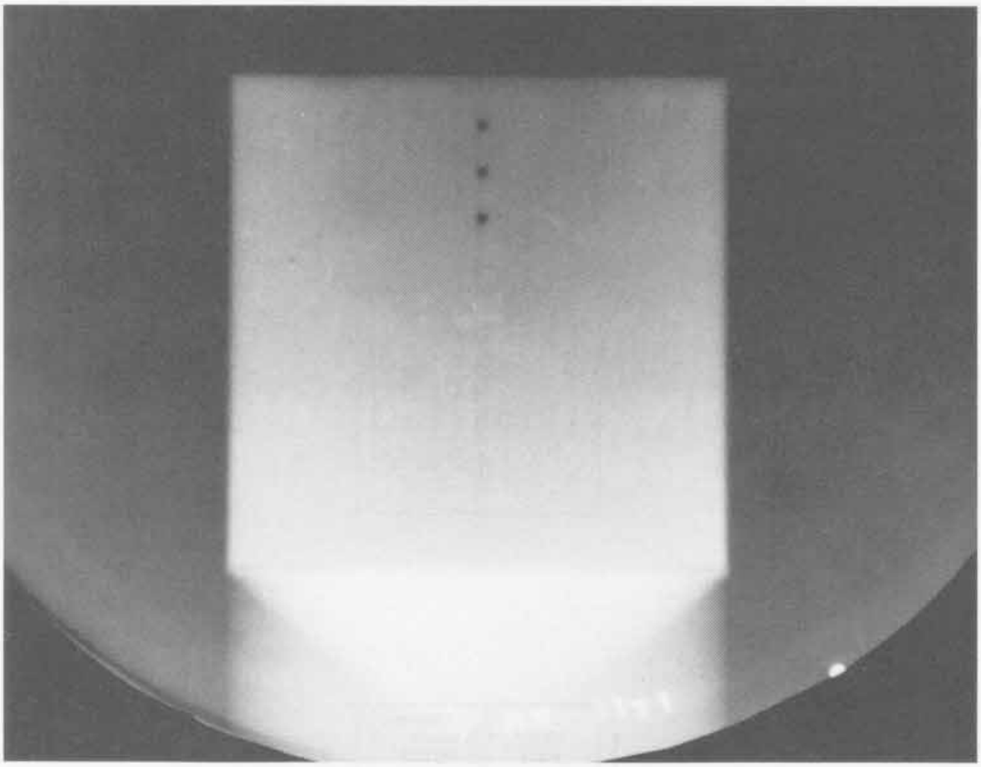


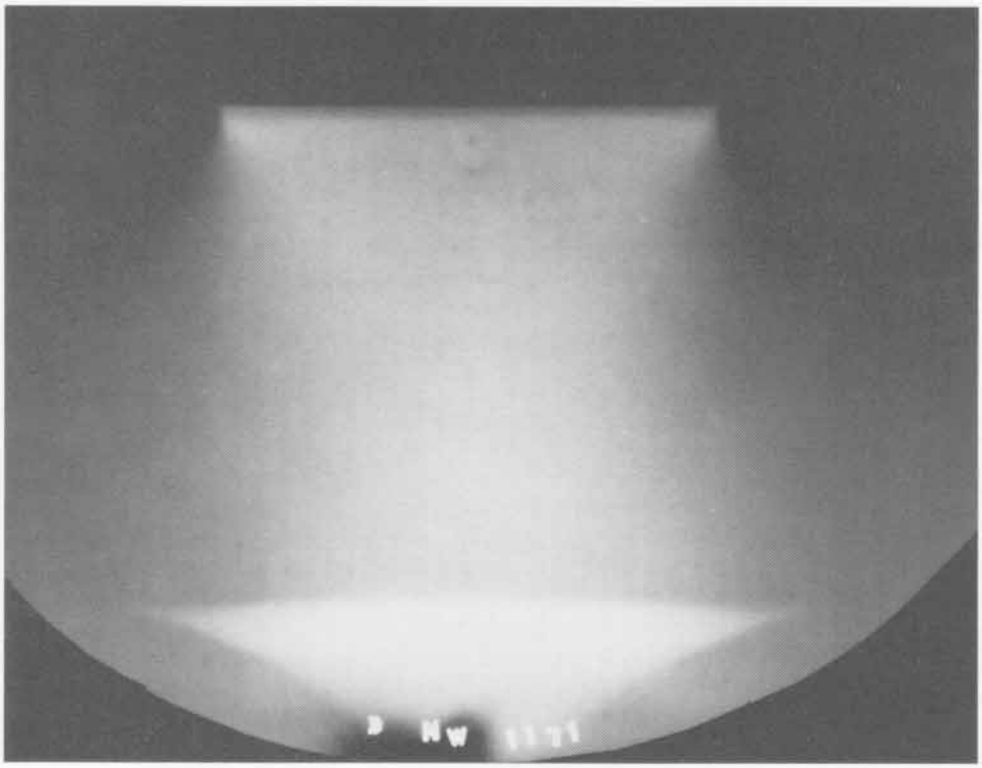
SHOT 1171: **Perturbation Waves in PBX-9404**
Date: July 7, 1970
Experimenter: William C. Davis
Radiographic Time: 24.88 μs

Two 50.8-mm-wide by 101.6-mm-high blocks of PBX-9404 with three 1.58-mm-square holes were initiated by a P-040 lens.



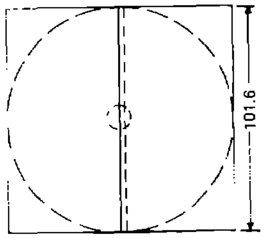


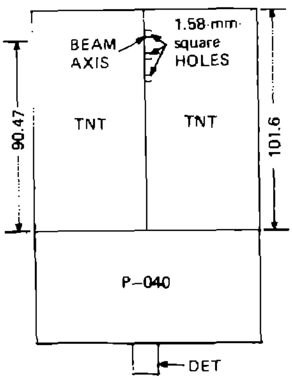


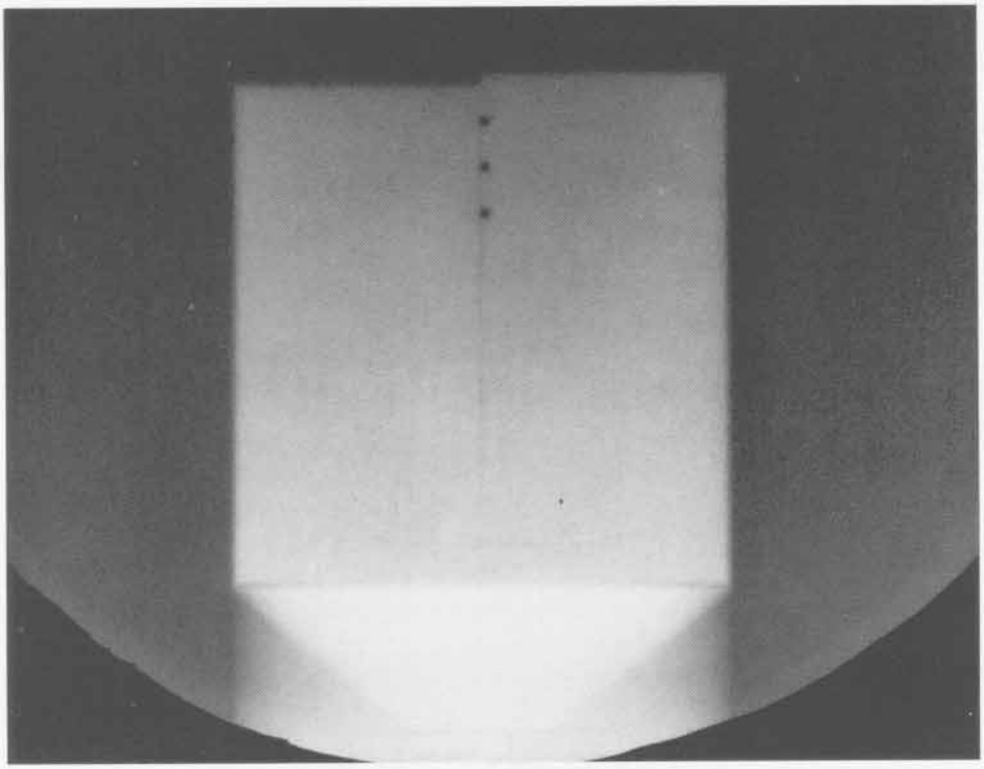


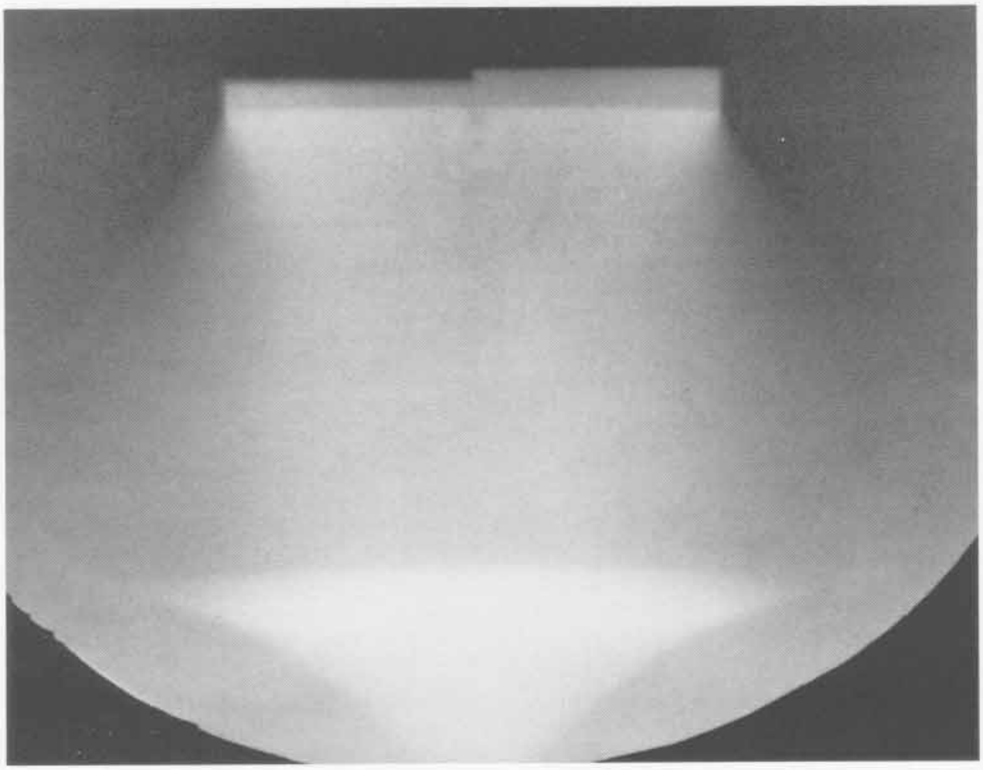
SHOT 1172: **Perturbation Waves in TNT**
Date: July 14, 1970
Experimenter: William C. Davis
Radiographic Time: 27.99 μs

Two 50.8-mm-wide by 101.6-mm-high blocks of TNT with three 1.58-mm-square holes were initiated by a P-040 lens.



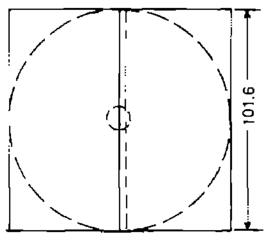


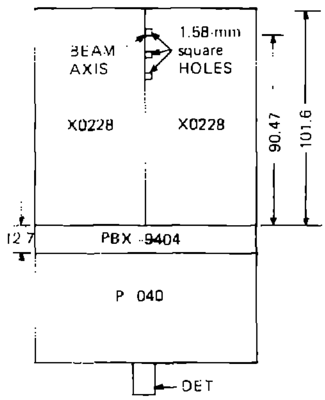


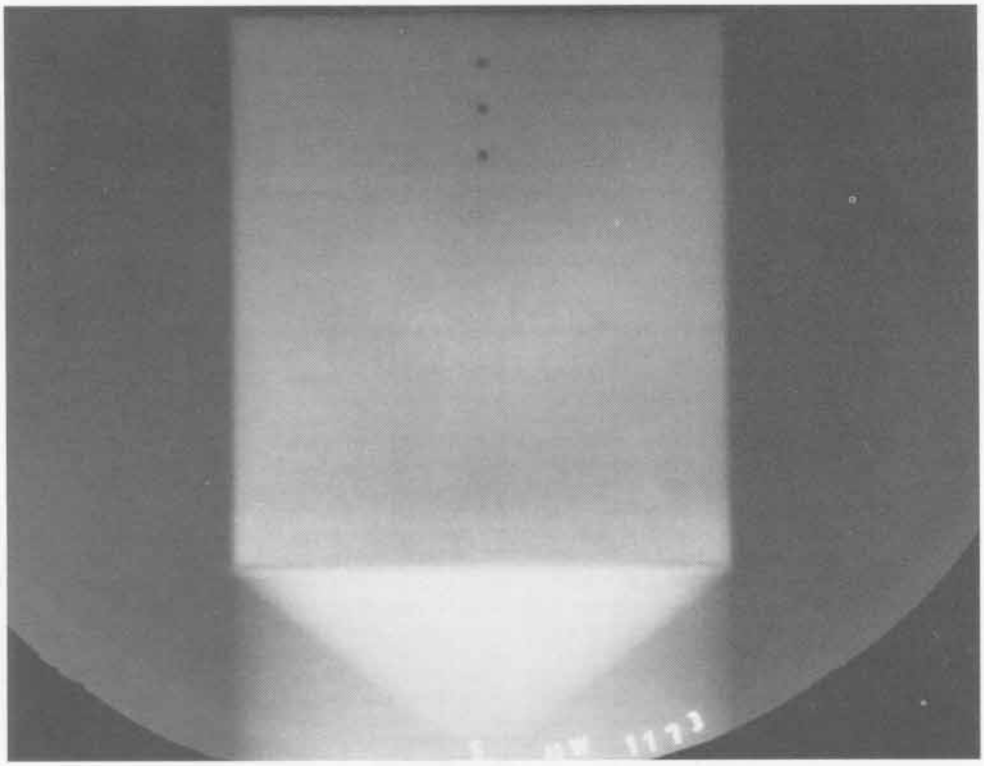


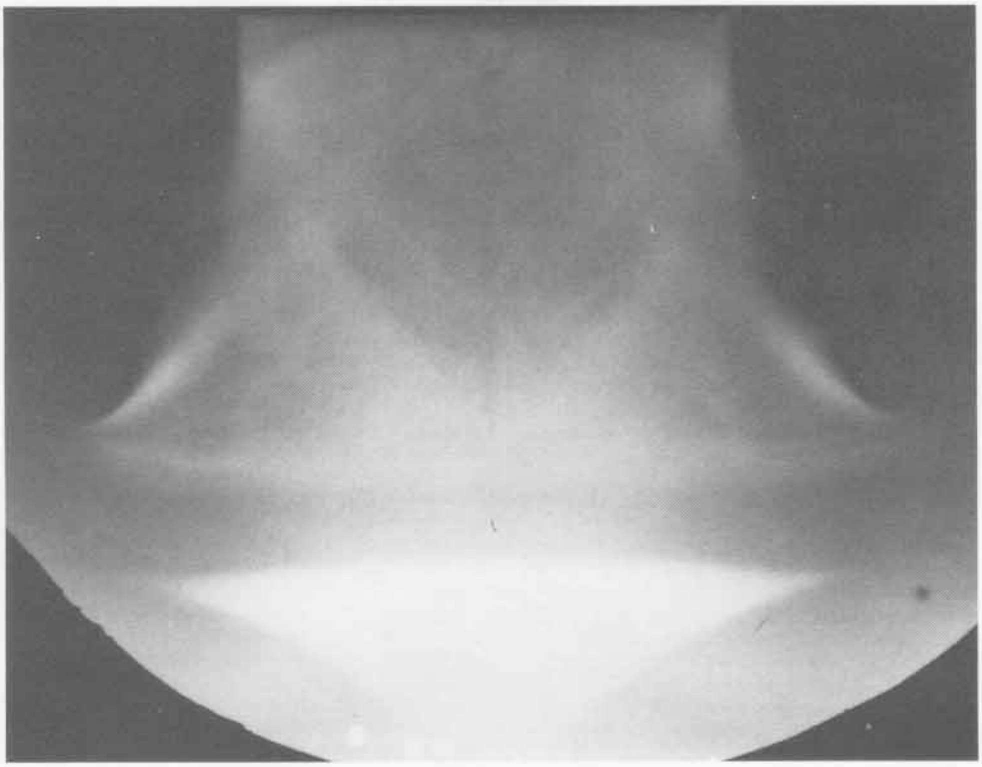
SHOT 1173: **Perturbation Waves in Nitroguanidine**
Date: July 15, 1970
Experimenter: William C. Davis
Radiographic Time: 27.10 μs

Two 50.8-mm-wide by 101.6-mm-high blocks of X0228 (95/5 wt% nitroguanidine and Estane at 1.703 g/cm³) with three 1.58-mm-square holes were initiated by 12.7 mm of PBX-9404 and a P-040 lens.



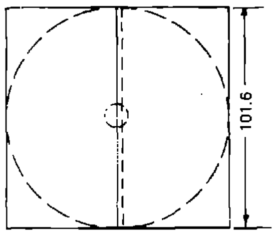


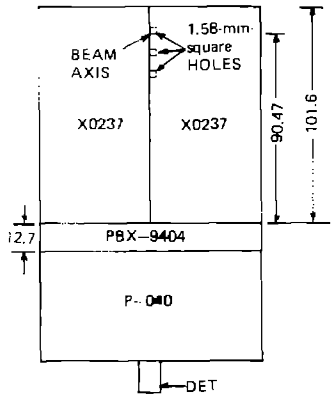


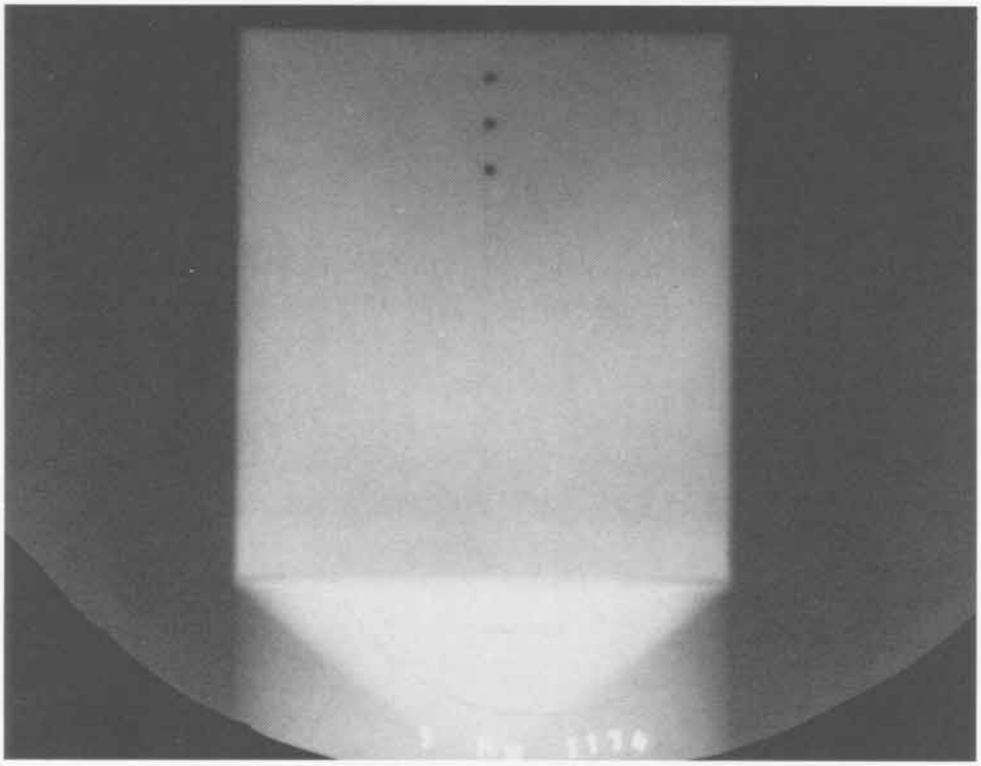


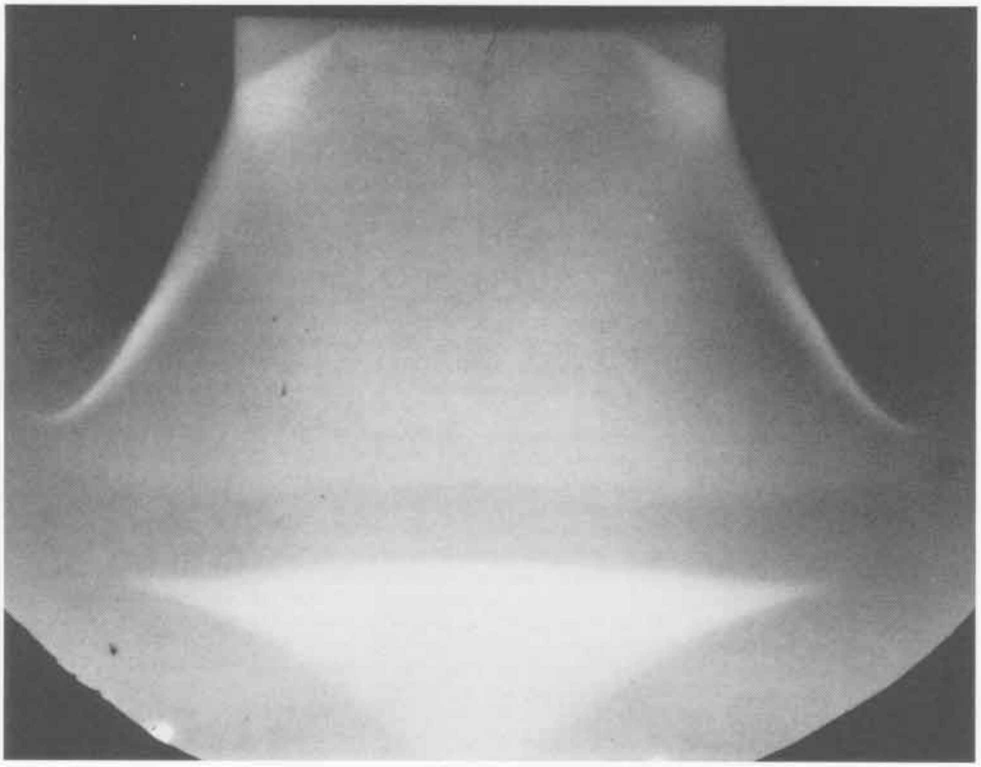
SHOT 1174: **Perturbation Waves in TATB**
Date: July 15, 1970
Experimenter: William C. Davis
Radiographic Time: 28.19 μs

Two 50.8-mm-wide by 101.6-mm-high blocks of X0237 (90/5/5 wt% TATB/B[2] wax/ Elvax at 1.739 g/cm^3) with three 1.58-mm-square holes were initiated by 12.7 mm of PBX-9404 and a P-040 lens.



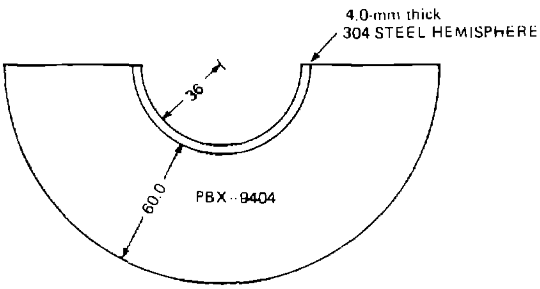


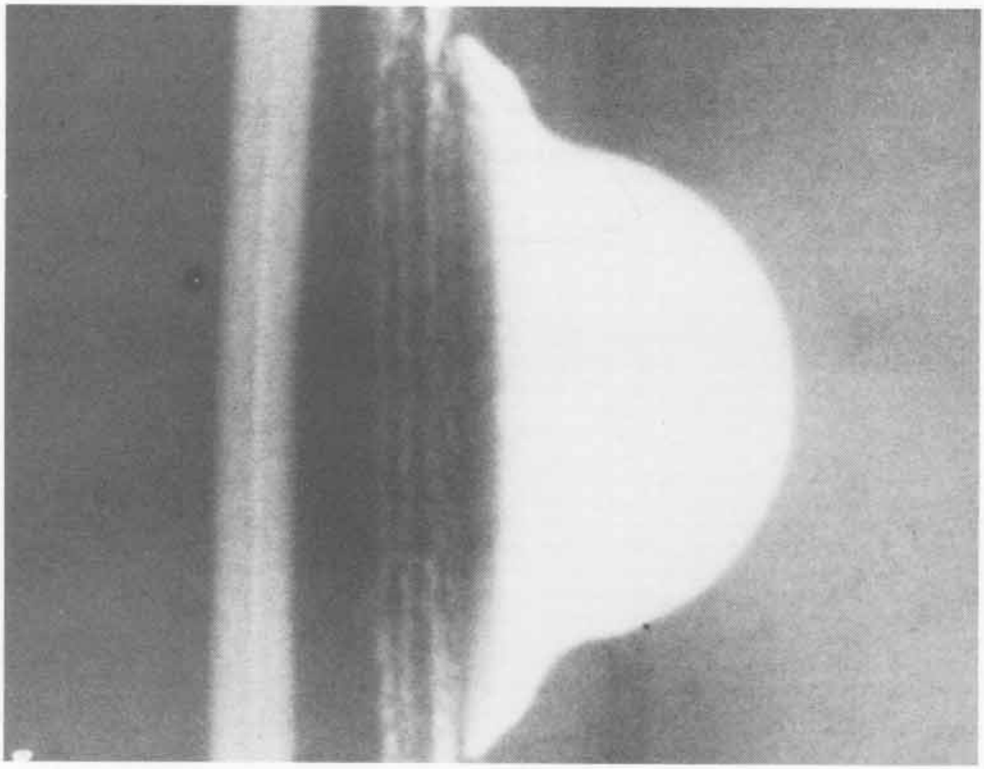




SHOT 1175: **Steel Jets**
Date: November 17, 1965
Experimenter: Gary W. Rodenz
Radiographic Time: 64.26 μs

A jet of 304 stainless steel was formed by a 4.0-mm-thick steel hemishell driven by a 60.0-mm-thick PBX-9404 hemisphere. The jet traveled for 20.8 μs. See also Shots 1177 and 1178.





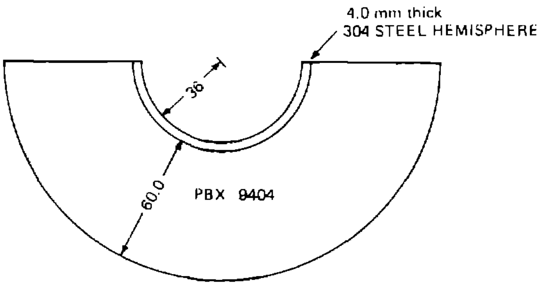
SHOT 1177: **Steel Jet**

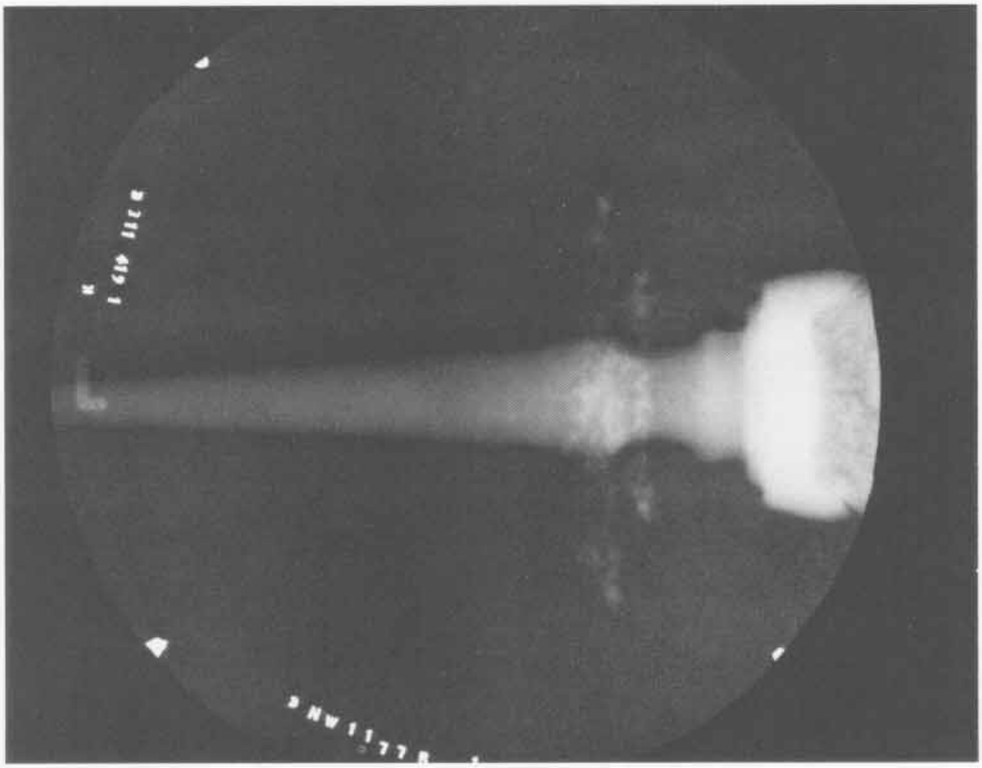
Date: January 6, 1966

Experimenter: Gary W. Rodenz

Radiographic Time: 90.27 μs

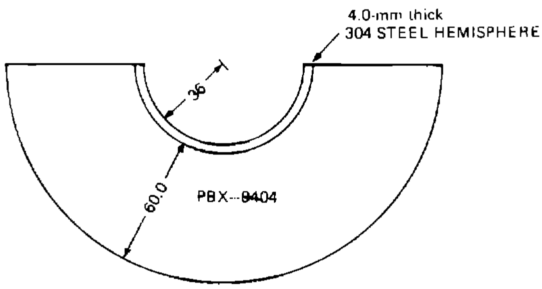
A jet of 304 stainless steel was formed by a 4.0-mm-thick steel hemishell driven by a 60.0-mm-thick PBX-9404 hemisphere. The jet traveled for 46.8 μs. See also Shots 1175 and 1178.

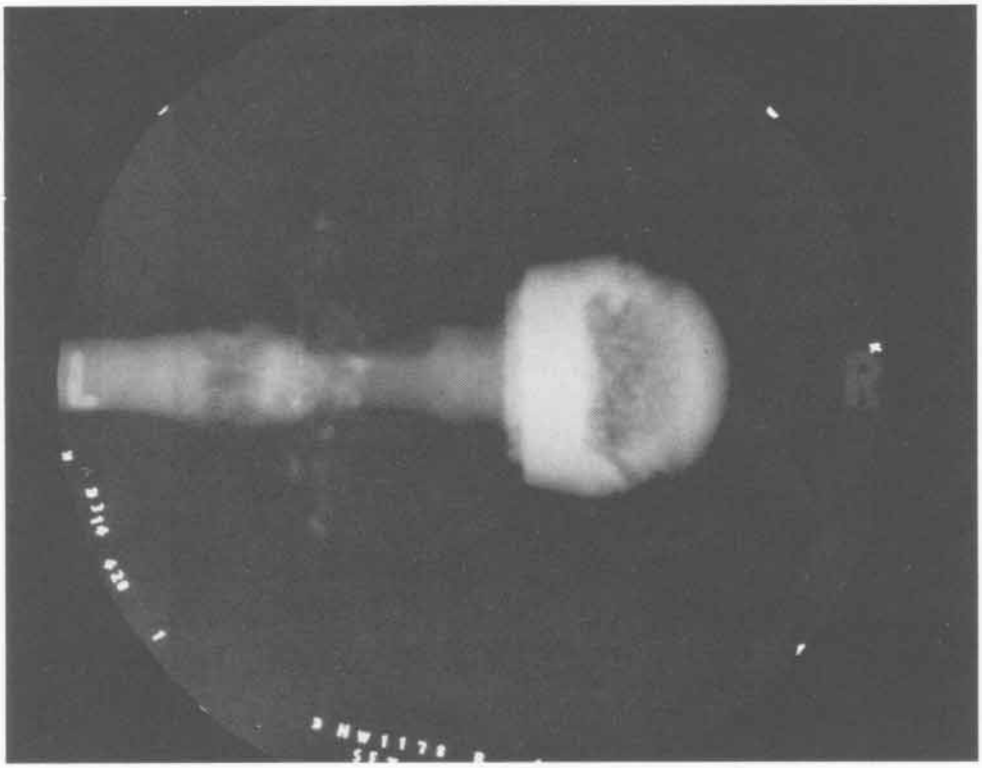




SHOT 1178: **Steel Jet**
Date: January 13, 1966
Experimenter: Gary W. Rodenz
Radiographic Time: 102.68 μs

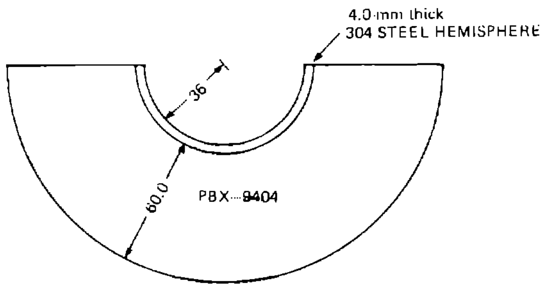
A jet of 304 stainless steel was formed by a 4.0-mm-thick steel hemishell driven by a 60.0-mm-thick PBX-9404 hemisphere. The jet traveled for 59.23 μs. See also Shots 1175 and 1177.

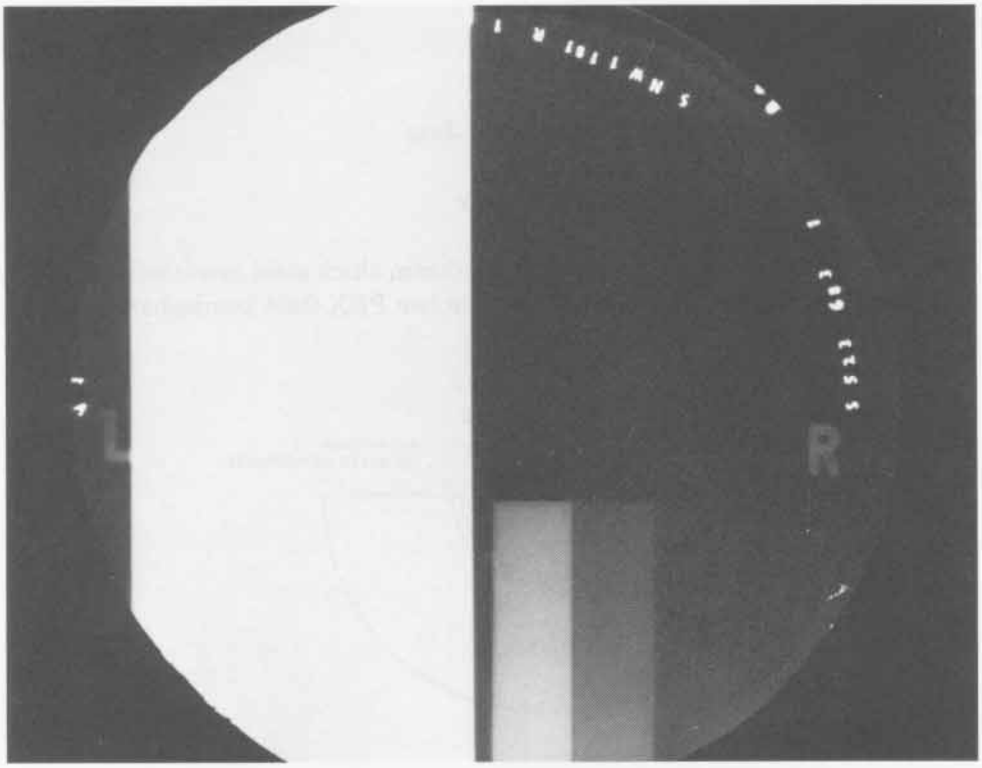


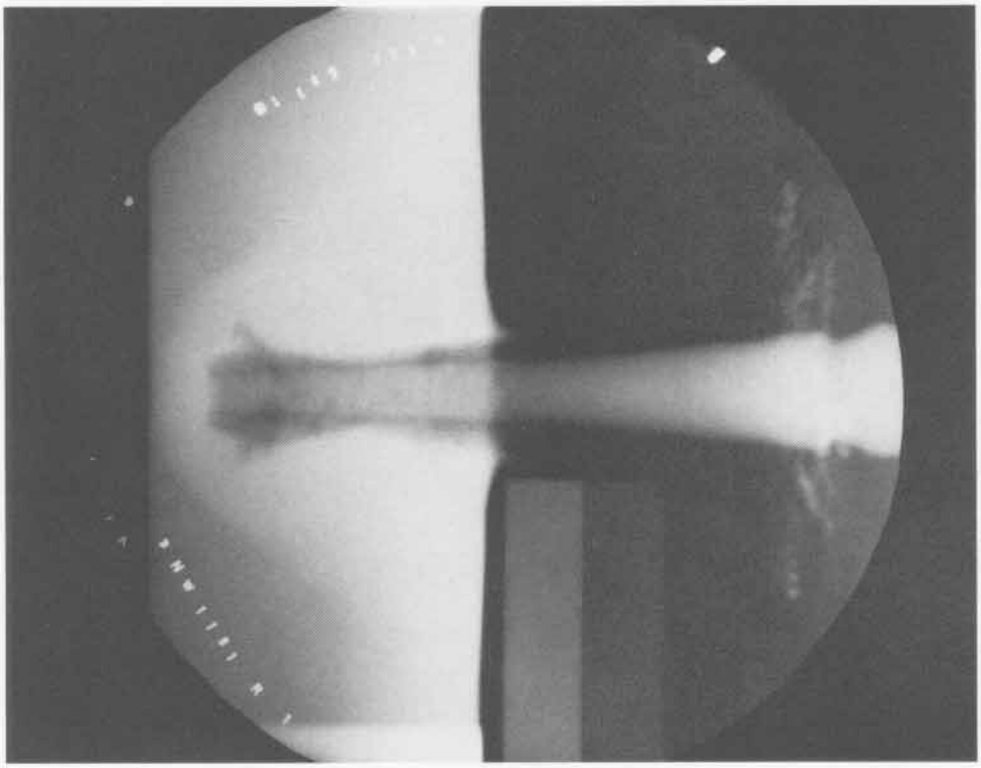


SHOT 1181: **Steel Jet Penetration**
Date: February 6, 1968
Experimenter: Gary W. Rodenz
Radiographic Time: 85.99 μs

A 304 stainless steel block was penetrated by a jet of steel formed by a 4.0-mm-thick steel hemishell driven by a 60.0-mm-thick PBX-9404 hemisphere. The jet traveled for 42.53 μs. The steel block was 308 mm from the center of the steel hemishell. See also Shot 1185.

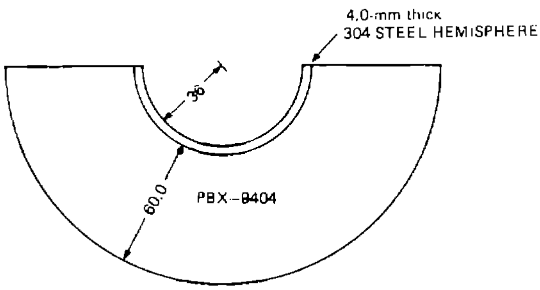


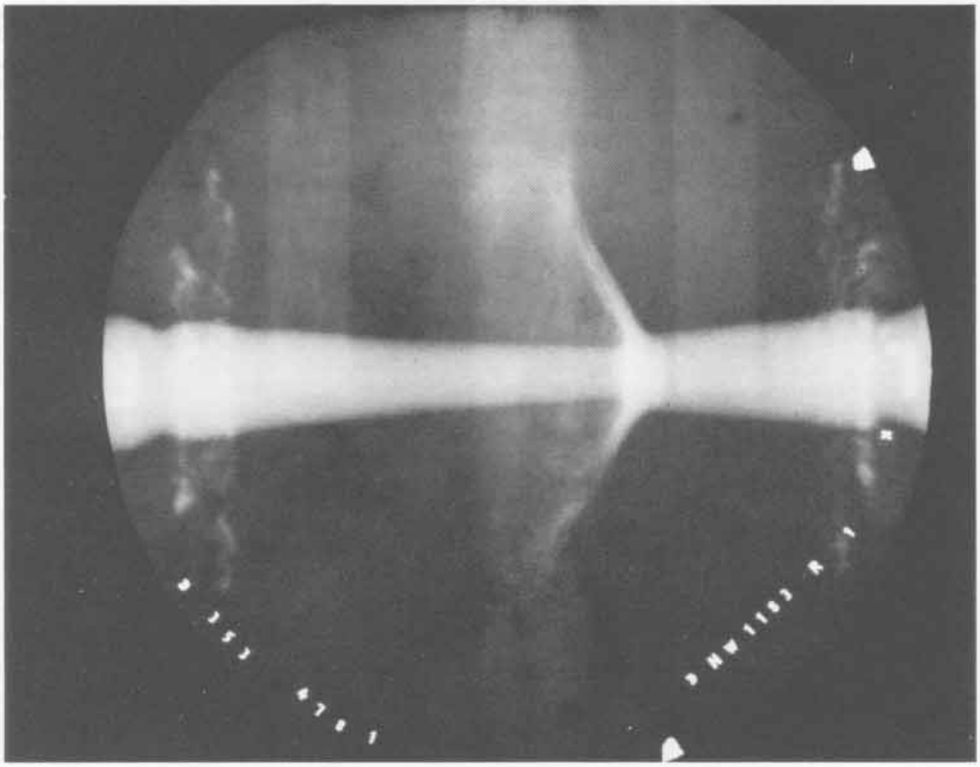




SHOT 1183: **Colliding Steel Jets**
Date: June 9, 1966
Experimenter: Gary W. Rodenz
Radiographic Time: 86.01 μs

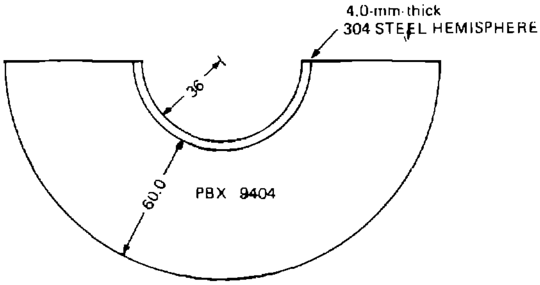
Collision of two steel jets formed by two 4.0-mm-thick steel hemishells driven by 60.0-mm-thick PBX-9404 hemispheres. The two PBX-9404 hemispheres were not detonated simultaneously.

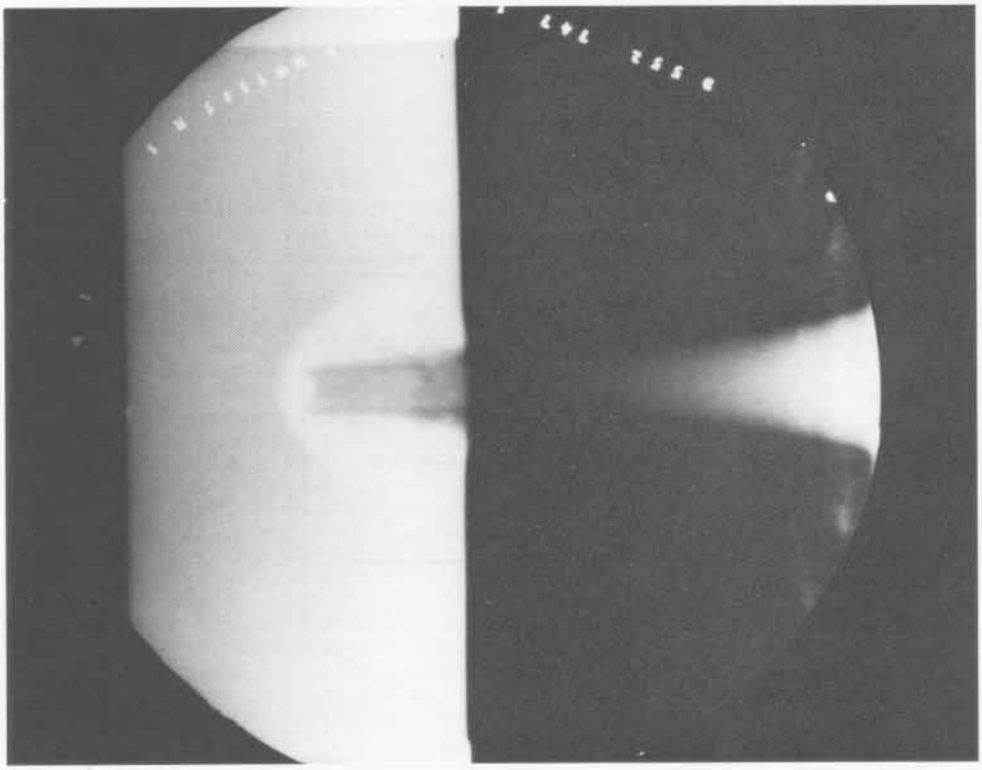




SHOT 1185: **Steel Jet Penetration**
Date: May 16, 1968
Experimenter: Gary W. Rodenz
Radiographic Time: 79.02 μs

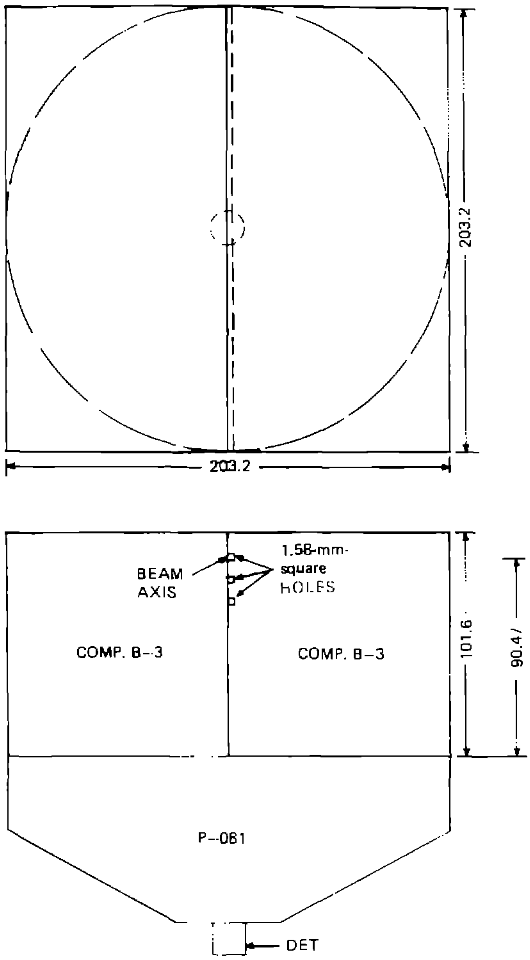
A jet of steel formed by a 4.0-mm-thick steel hemishell, which was driven by a 60.0-mm-thick PBX-9404 hemisphere, penetrated a 304 stainless steel block. The jet traveled for 35.57 μs. The steel block was 308 mm from the center of the steel hemishell. See also Shot 1181.

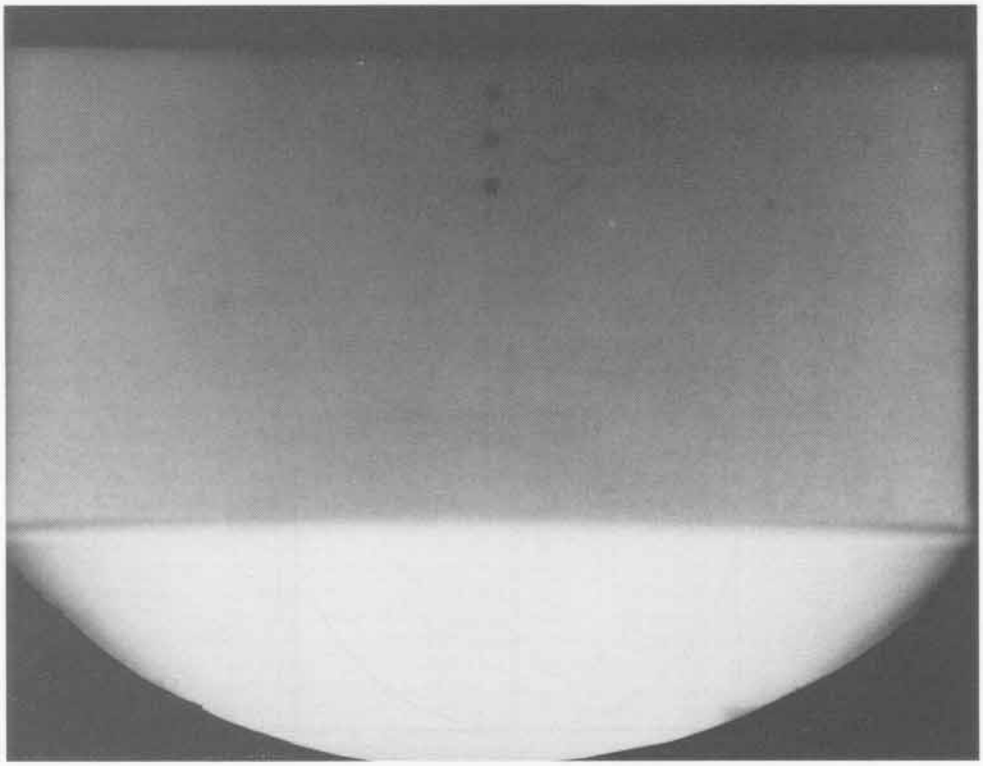


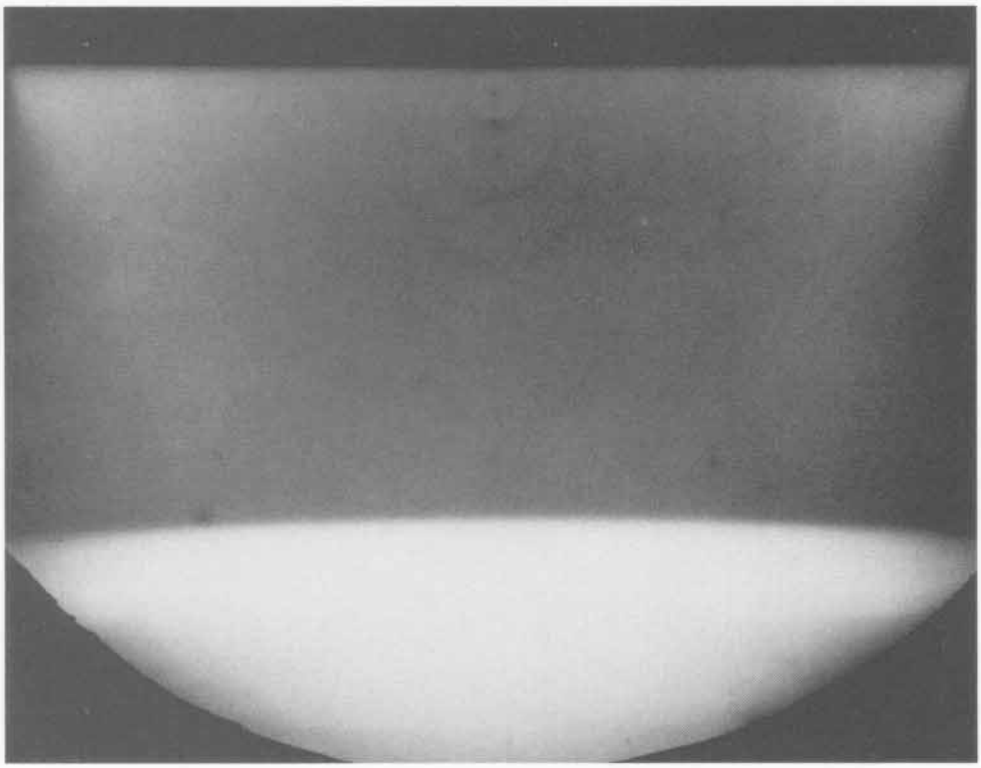


SHOT 1207:	**Perturbation Waves in Composition B-3**
Date:	July 7, 1970
Experimenter:	William C. Davis
Radiographic Time:	35.2 μs

Two 101.6-mm cubes of Composition B-3 with three 1.58-mm-square holes were initiated by a P-081 lens.

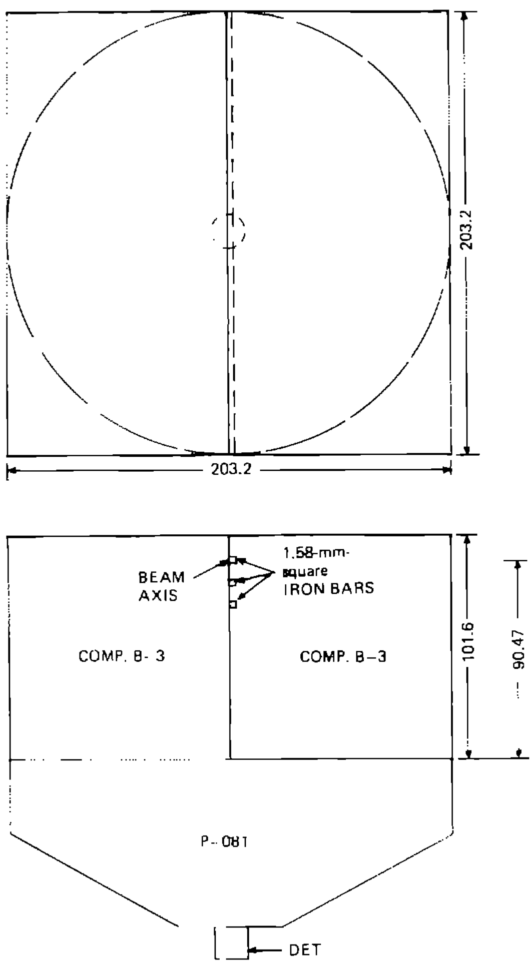


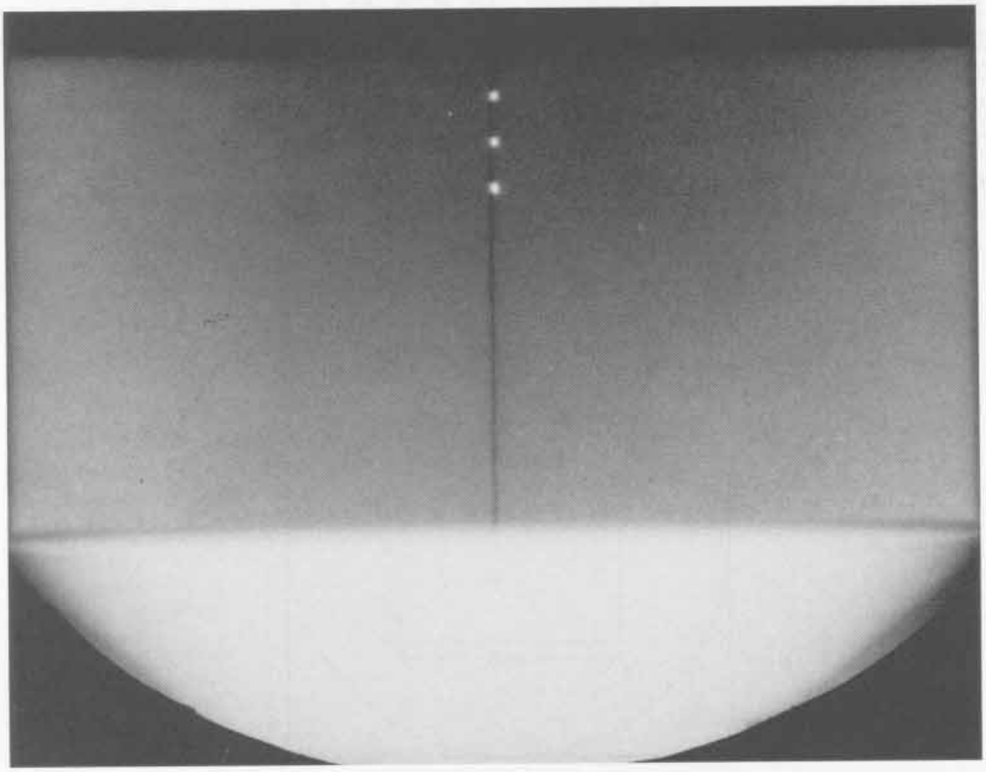


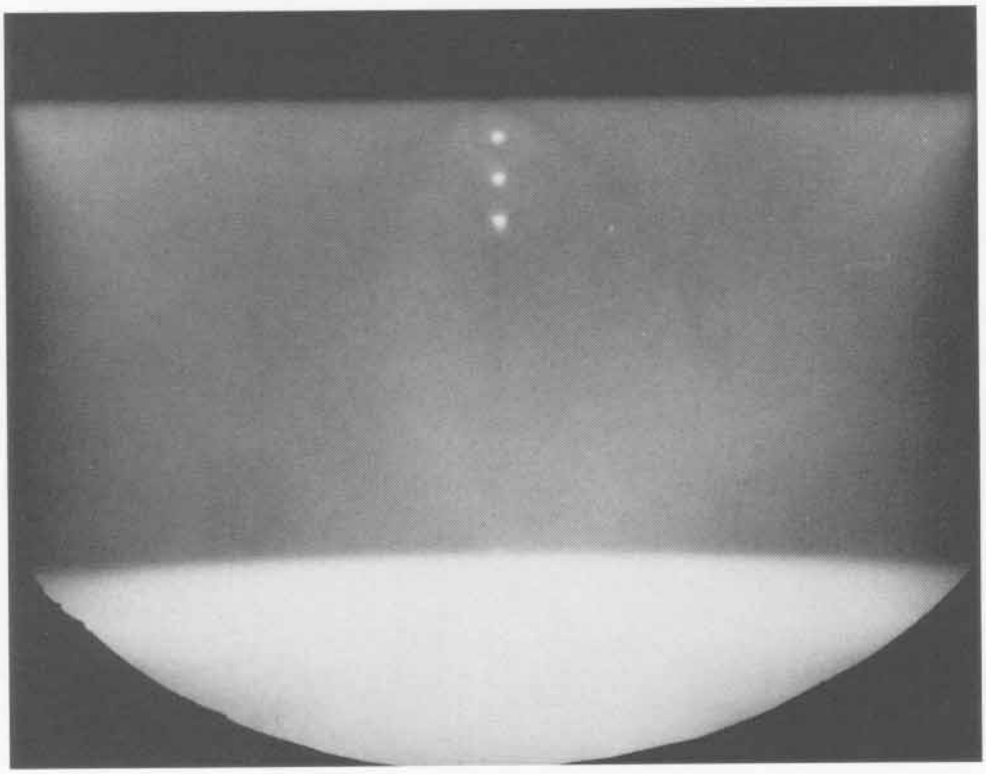


SHOT 1208: **Perturbation Waves in Composition B-3**
Date: June 30, 1970
Experimenter: William C. Davis
Radiographic Time: 35.16 μs

Two 101.6-mm cubes of Composition B-3 had three 1.587-mm-square iron bars embedded in the explosive. The Composition B-3 was initiated by a P-081 lens.

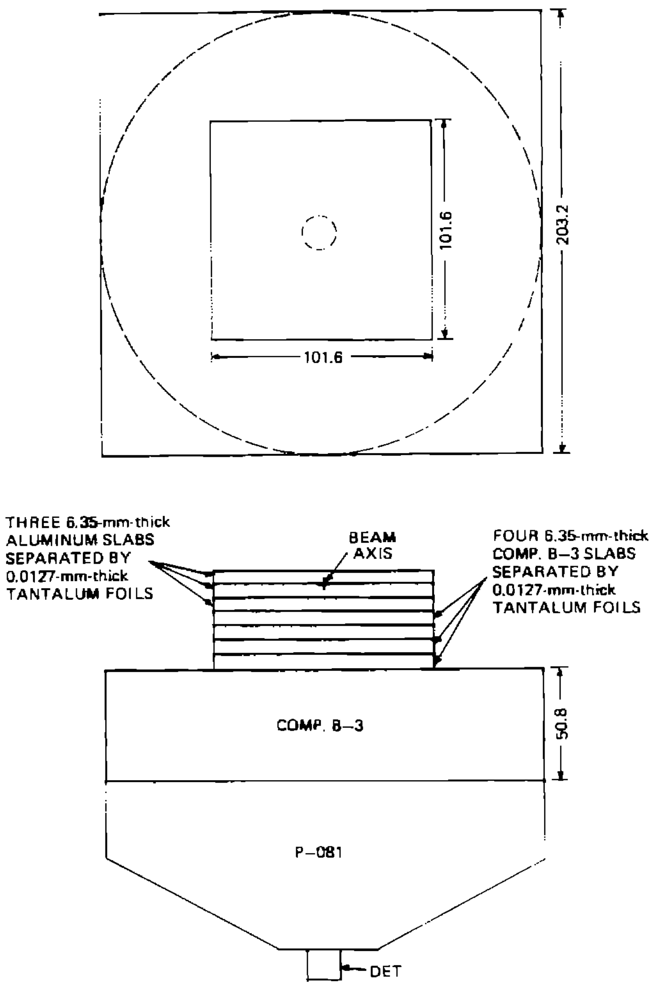


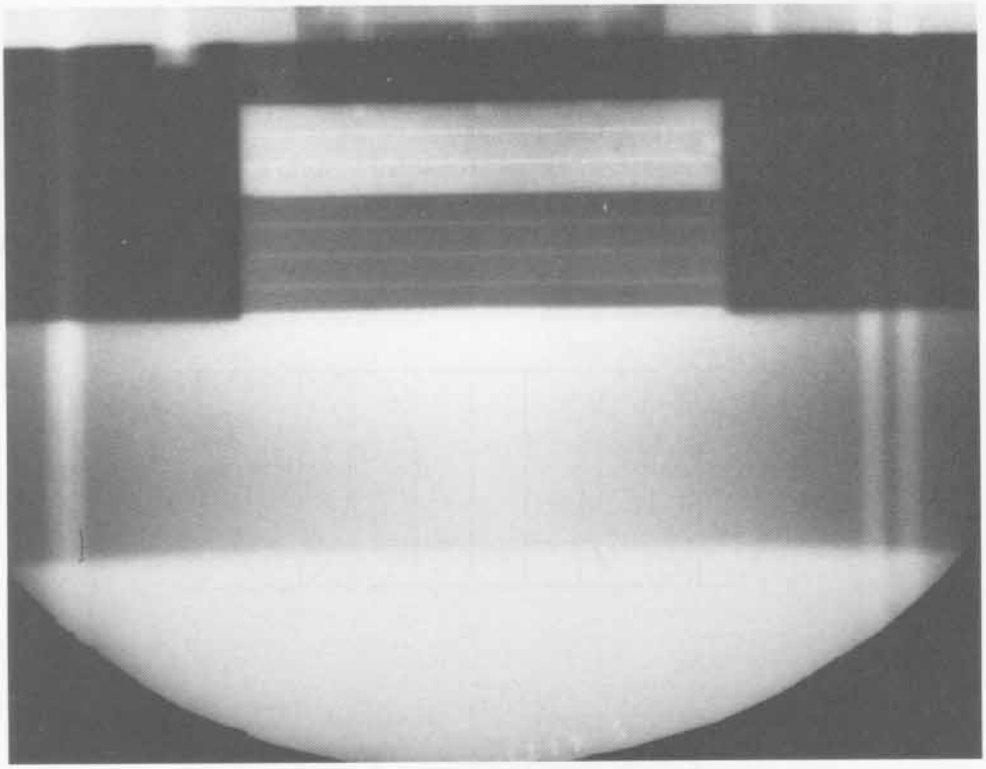


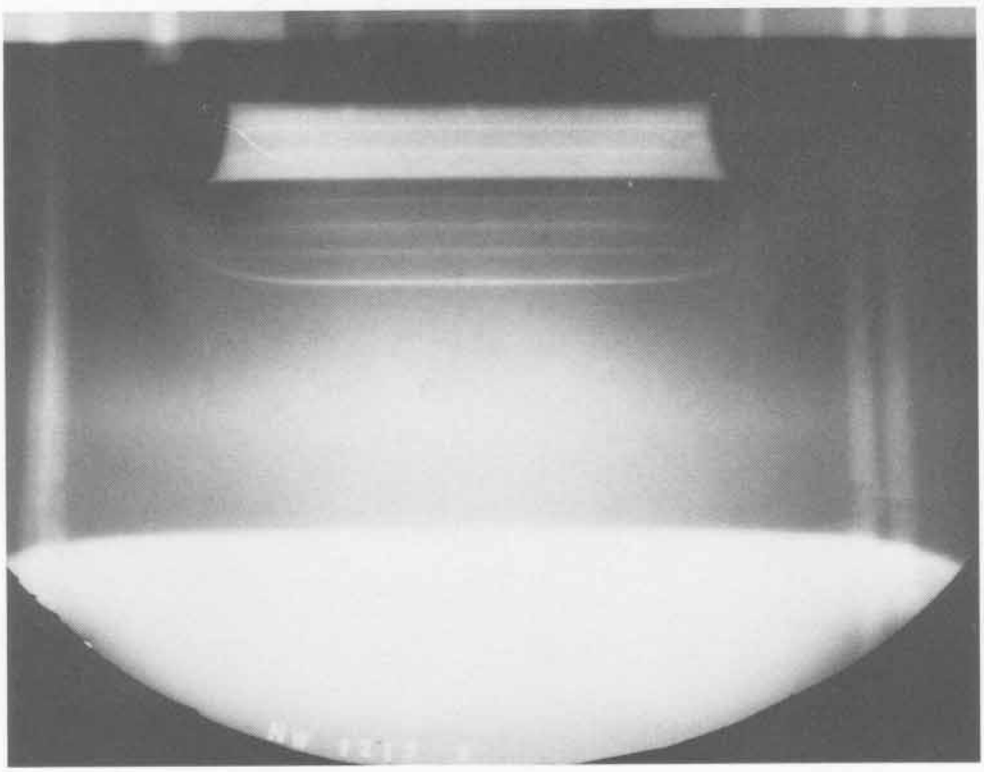


SHOT 1219:	**Aluminum with Embedded Tantalum Foils**
Date:	August 6, 1970
Experimenter:	Douglas Venable
Radiographic Time:	34.53 μs

Three slabs of 6.35-mm-thick aluminum plates were shocked by four slabs of 6.35-mm-thick Composition B-3, all separated by 0.0127-mm tantalum foils, and 50.8 mm of Composition B-3 initiated by a P-081 lens.

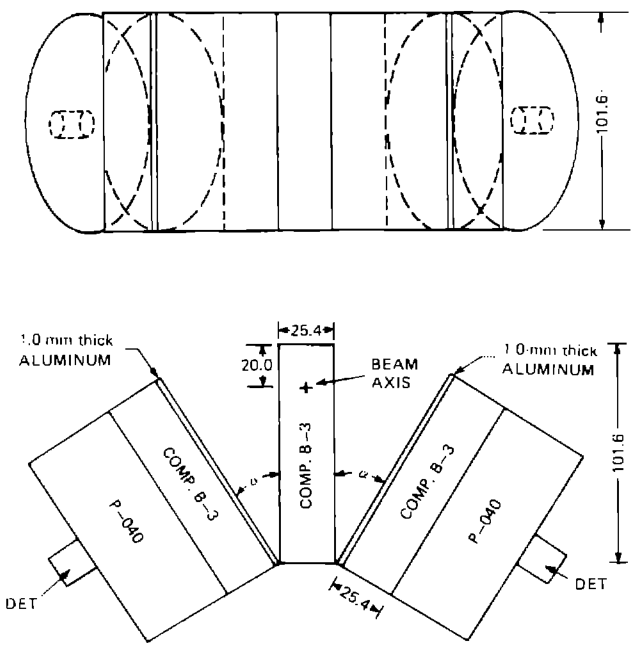


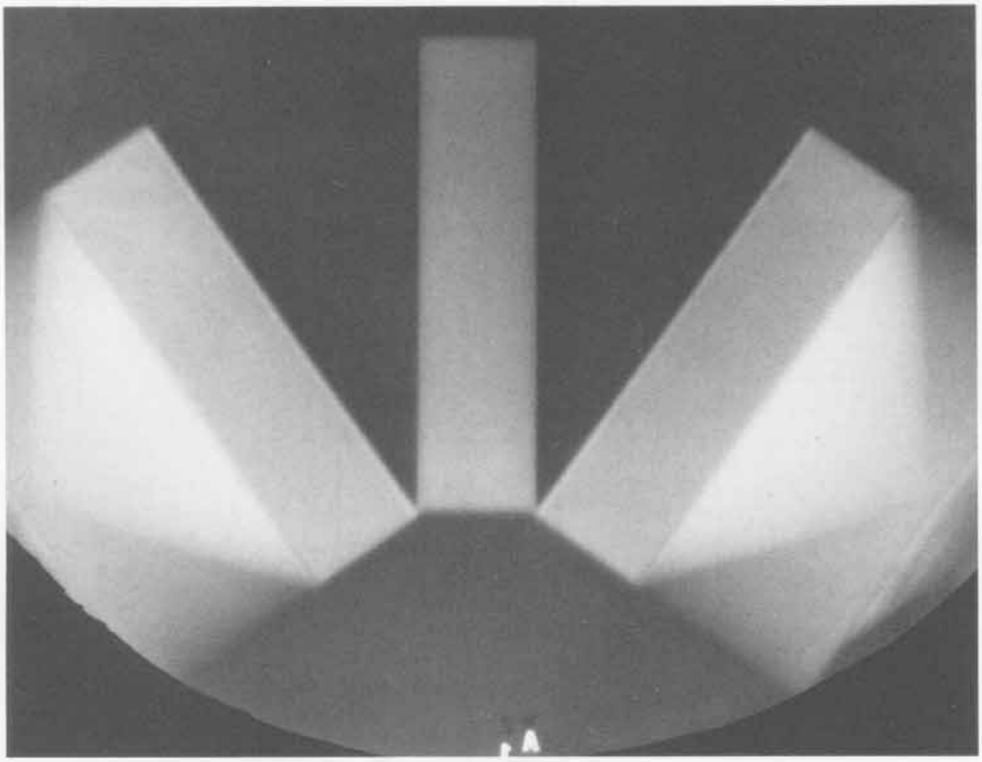


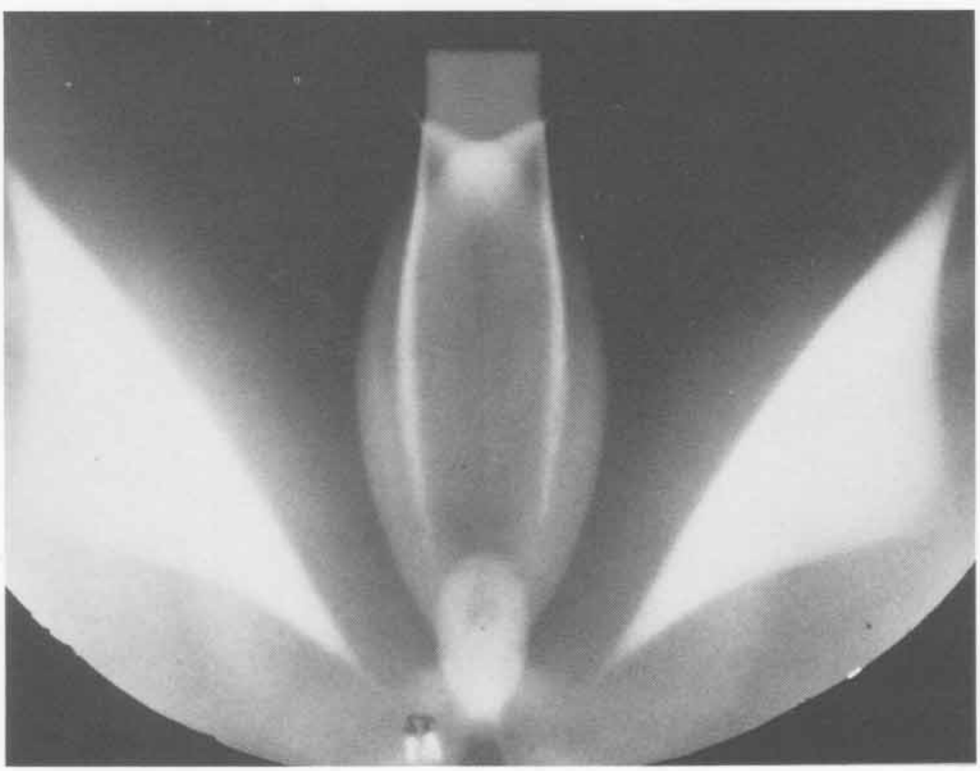


SHOT 1224: **Mach Reflection in Composition B-3**
Date: August 12, 1970
Experimenter: Douglas Venable
Radiographic Time: 26.90 μs

Two Composition B-3 detonation waves interacted to form a Mach reflection. The detonation waves were initiated by 1.0-mm-thick aluminum plates driven by 25.4-mm-thick slabs of Composition B-3 initiated by P-040 lenses. The angle of the plates, α, was 35°. See also Shots 1008, 1013, and 1018.

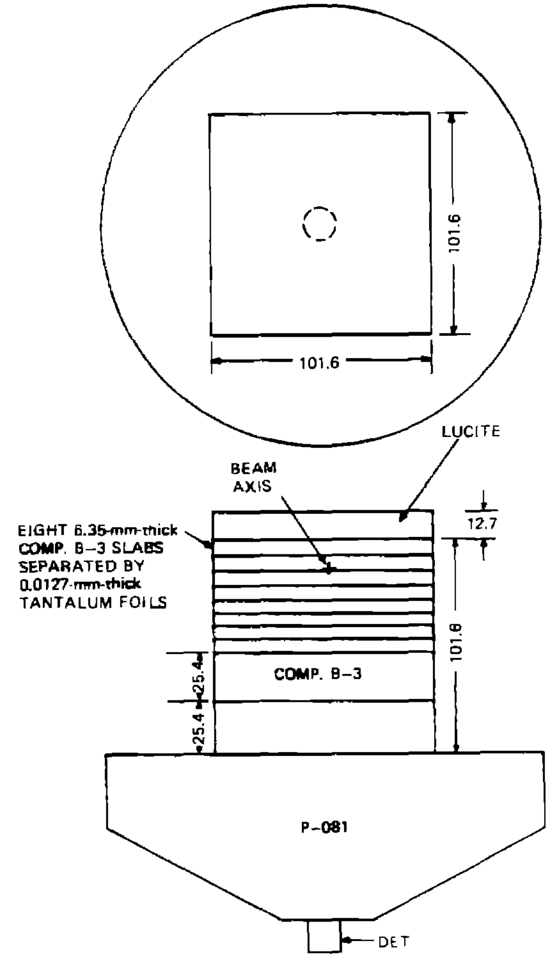


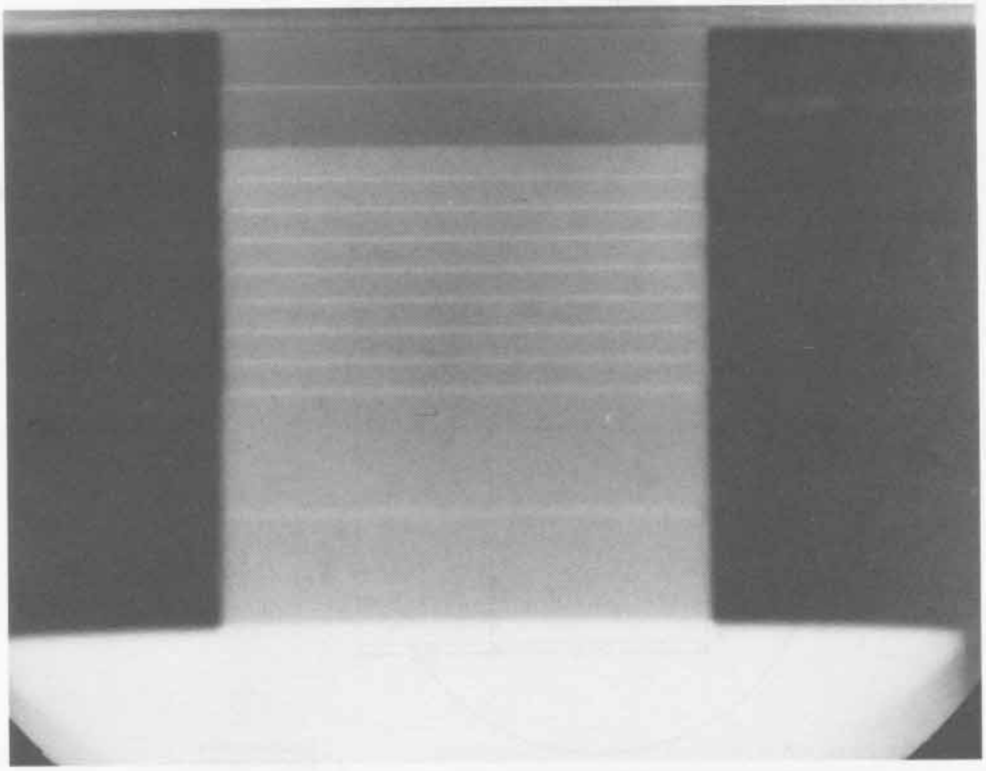


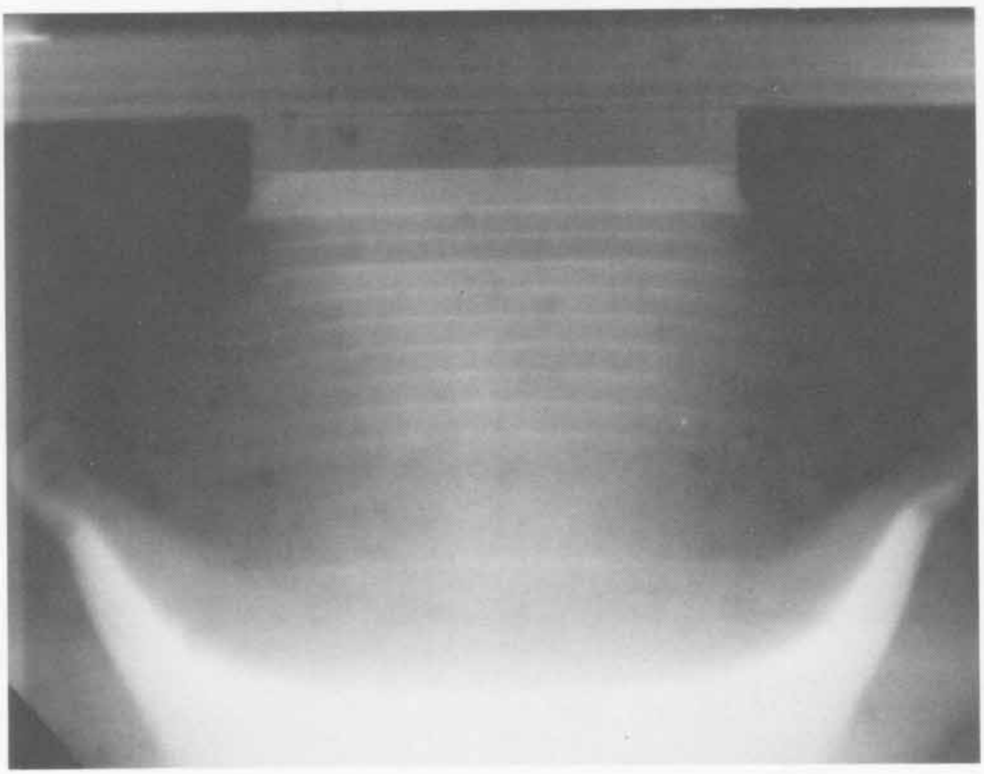


SHOT 1227:	**Composition B-3 with Embedded Tantalum Foils**
Date:	March 24, 1970
Experimenter:	Roger K. London
Radiographic Time:	37.53 μs

Eight slabs of 6.35-mm-thick Composition B-3 separated by 0.0127-mm-thick tantalum foils were initiated by two 25.4-mm-thick blocks of Composition B-3 separated by a 0.0127-mm-thick tantalum foil and a P-081 lens.

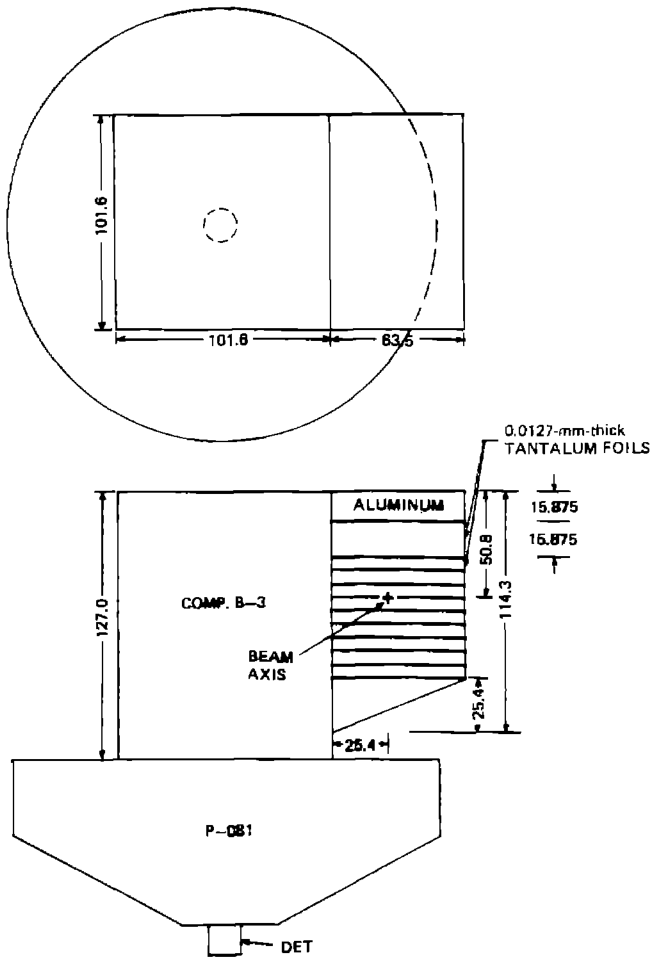


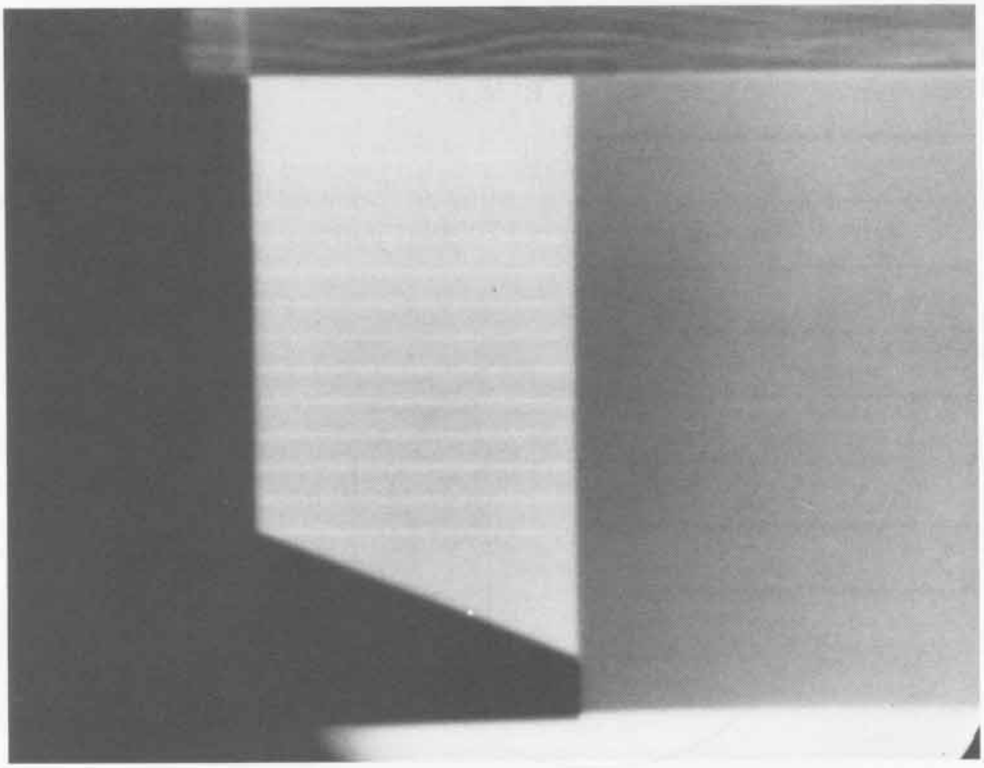


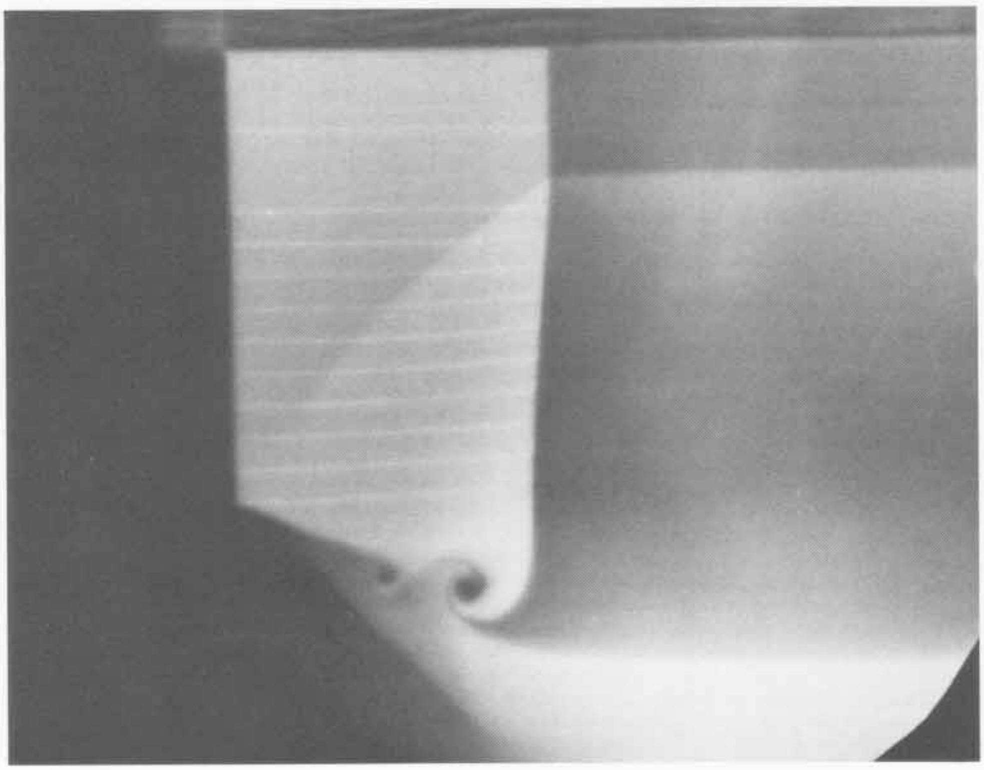


SHOT 1228: **Oblique Shock in Aluminum**
Date: June 17, 1970
Experimenter: Timothy R. Neal
Radiographic Time: 35.40 μs
Reference: Neal, 1976b.

An oblique shock wave in aluminum with 0.0127-mm-thick tantalum foils every 6.35 mm was driven by 127.0 mm of Composition B-3 initiated by a P-081 lens.

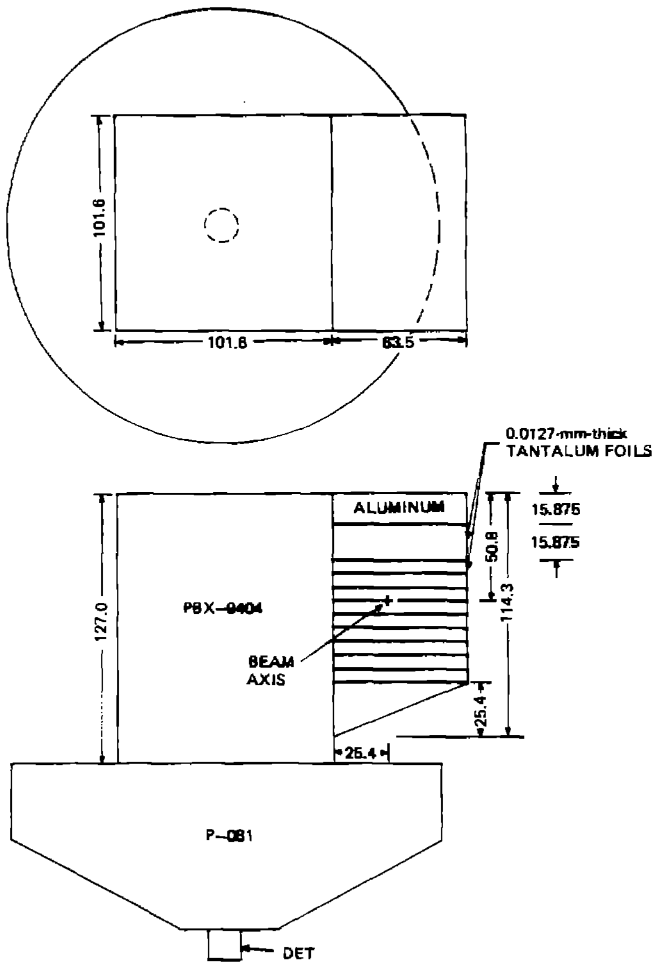


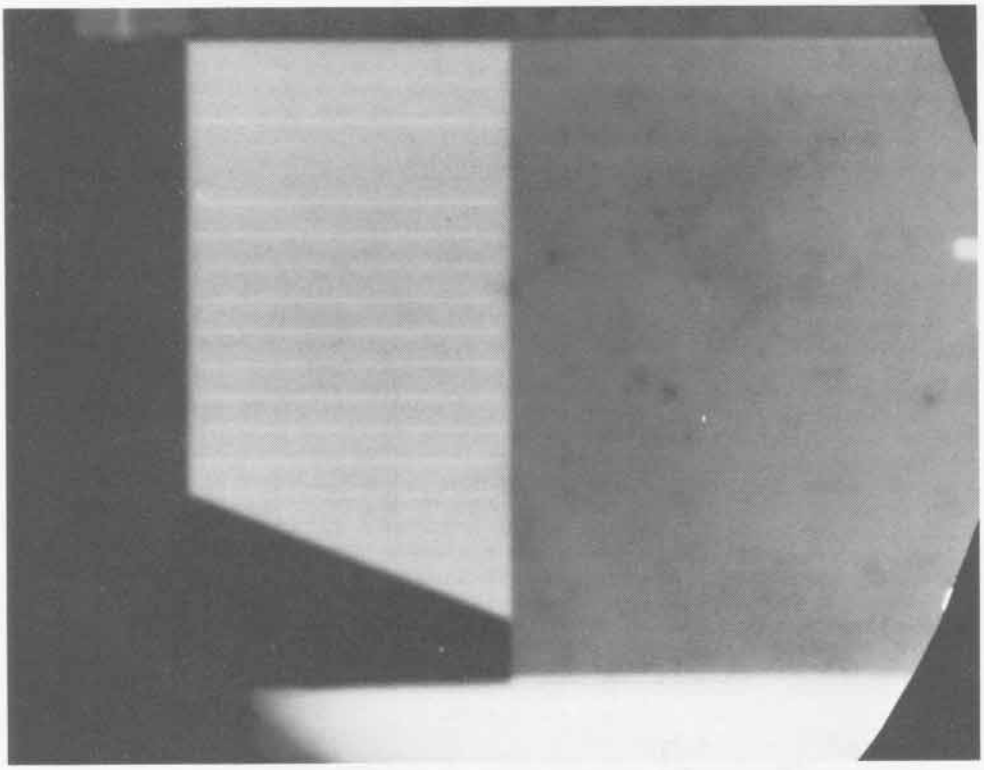


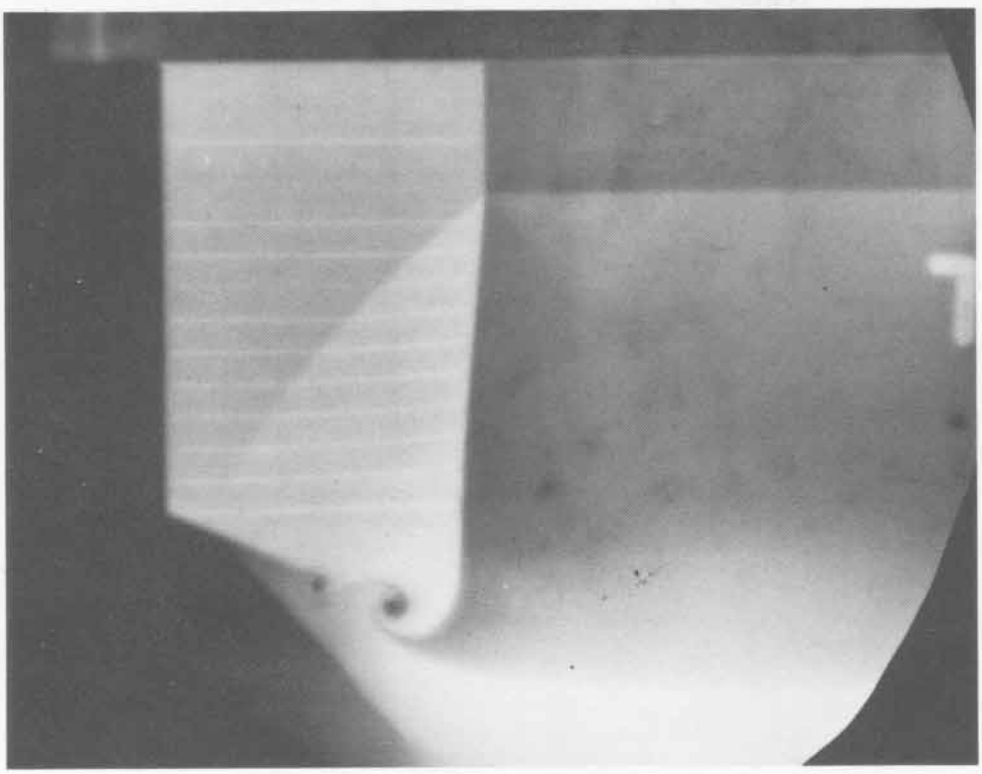


SHOT 1229: **Oblique Shock in Aluminum**
Date: September 3, 1970
Experimenter: Timothy R. Neal
Radiographic Time: 34.12 μs
Reference: Neal, 1976b

An oblique shock wave in aluminum with 0.0127-mm-thick tantalum foils every 6.35 mm was driven by 127.0 mm of PBX-9404 initiated by a P-081 lens.

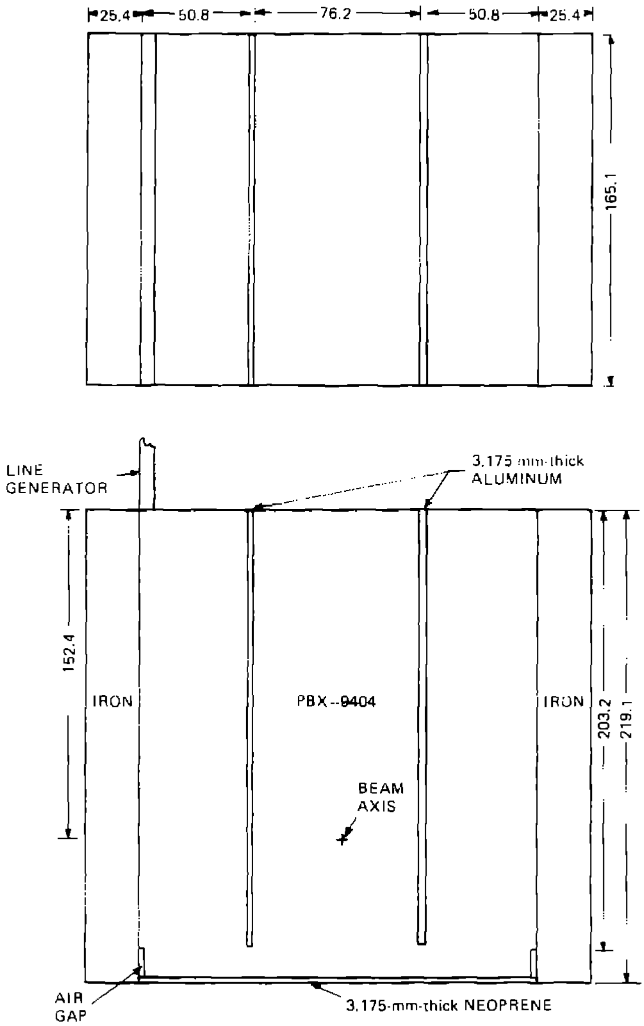


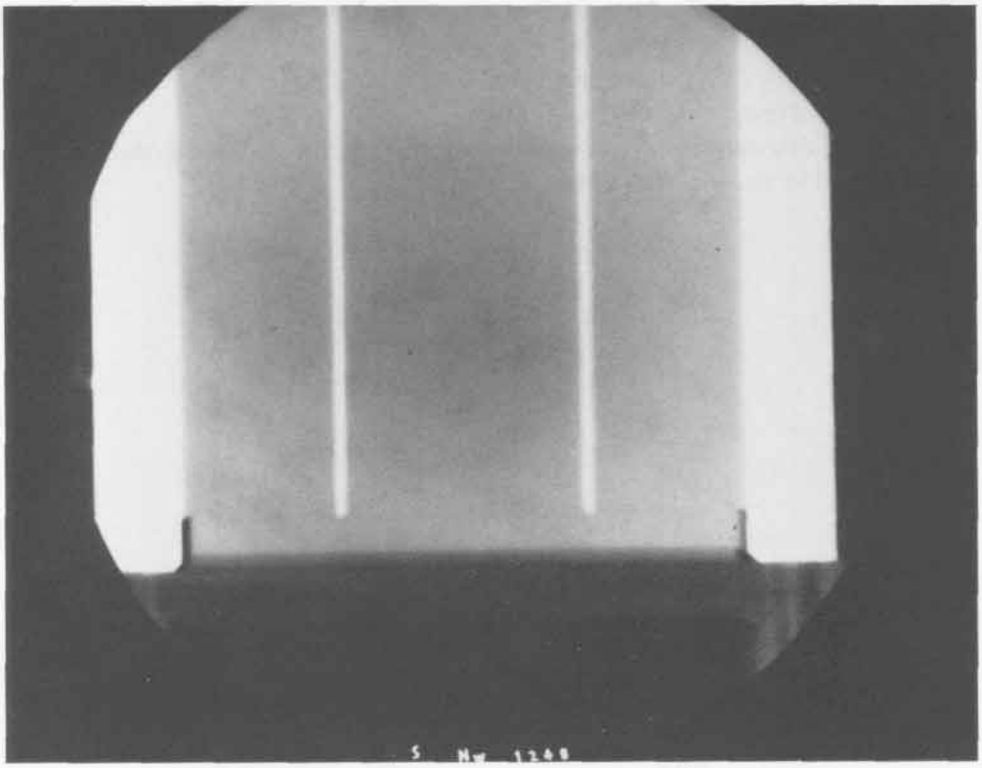


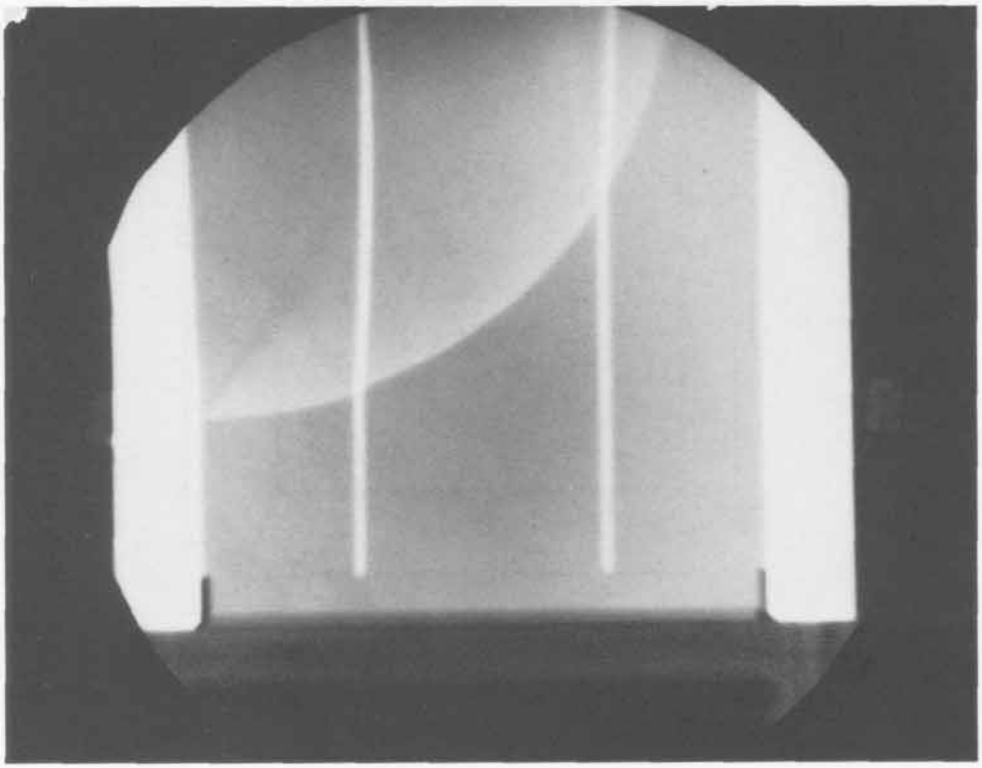


SHOT 1240: **Lateral Propagation of PBX-9404 Detonation**
Date: September 1, 1970
Experimenter: Douglas Venable
Radiographic Time: 48.58 μs

A PBX-9404 detonation was propagated laterally across 3.175-mm-thick aluminum plates.

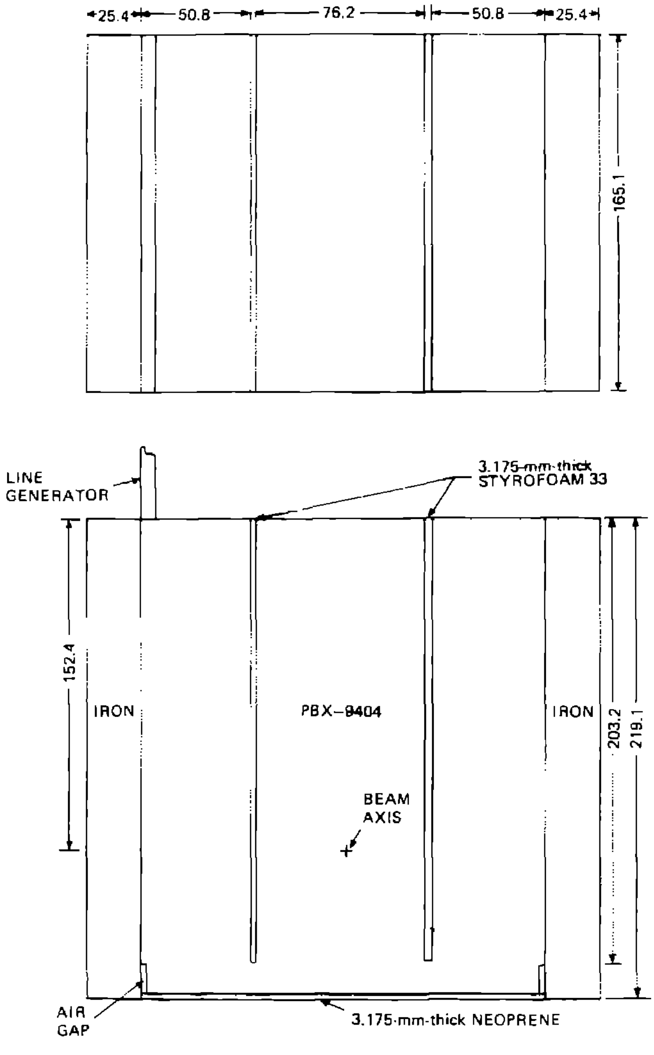


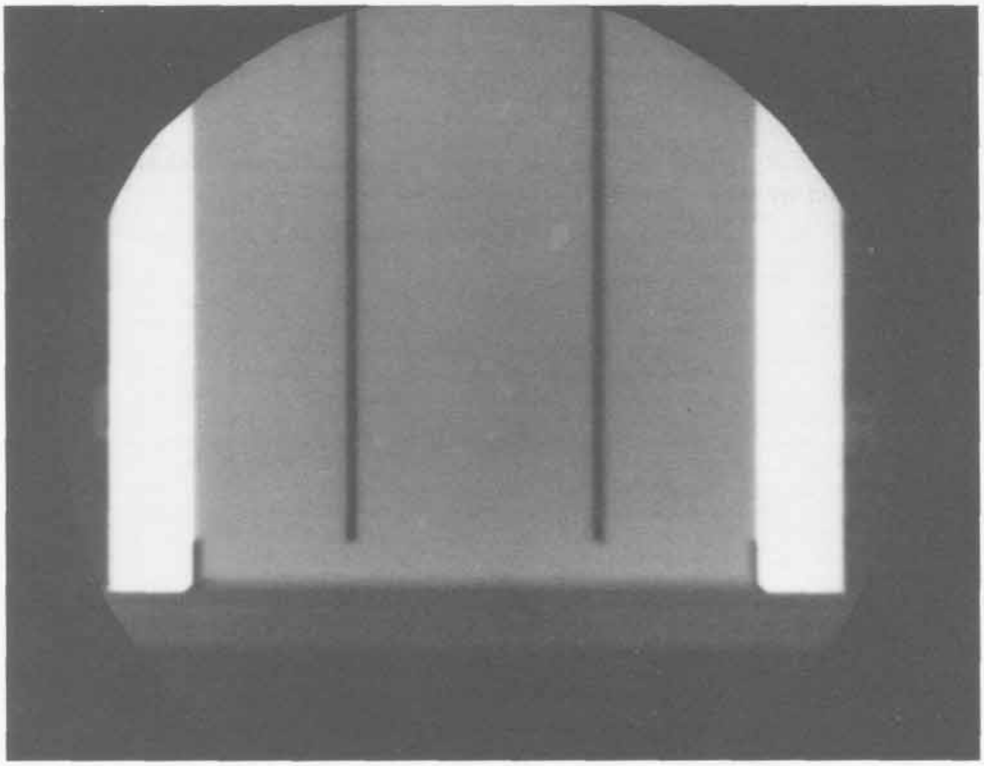


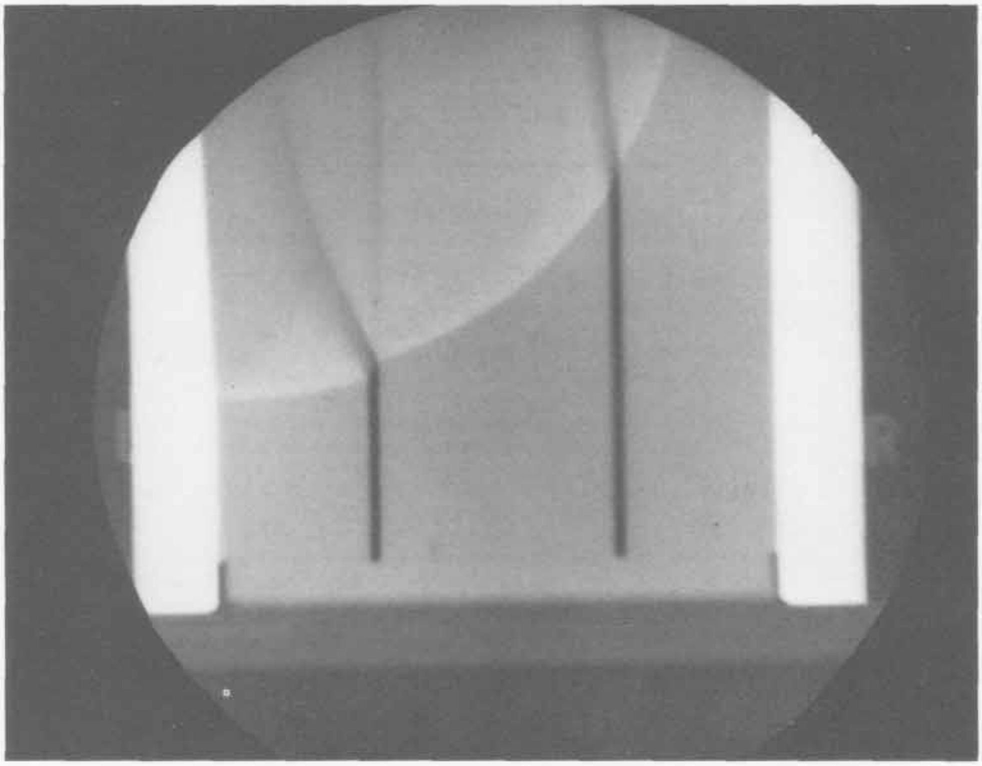


SHOT 1241: **Lateral Propagation of PBX-9404 Detonation**
Date: September 3, 1970
Experimenter: Douglas Venable
Radiographic Time: 38.57 μs

A PBX-9404 detonation was propagated laterally across 3.175-mm-thick slabs of Styrofoam 33 of density 0.05 g/cm³.

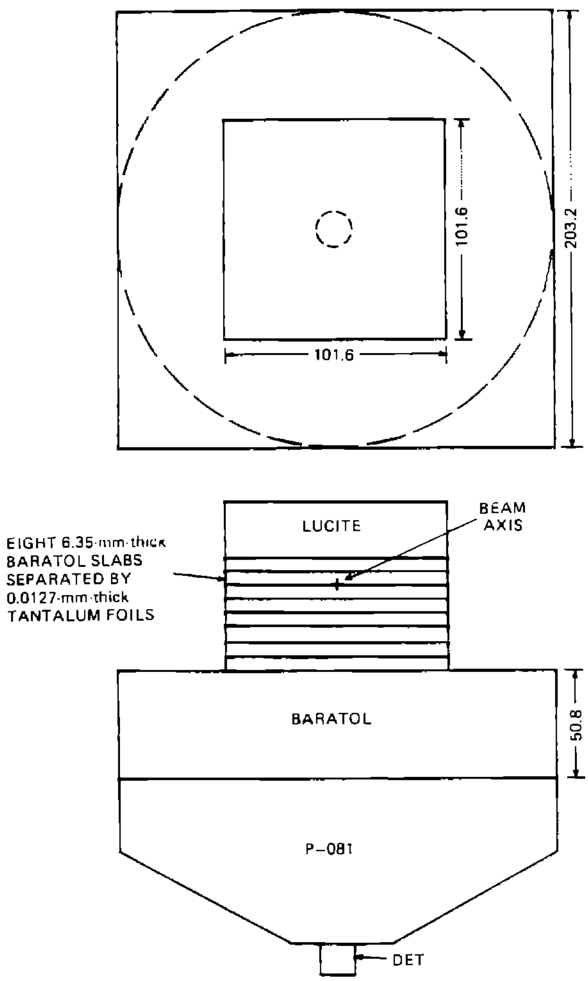


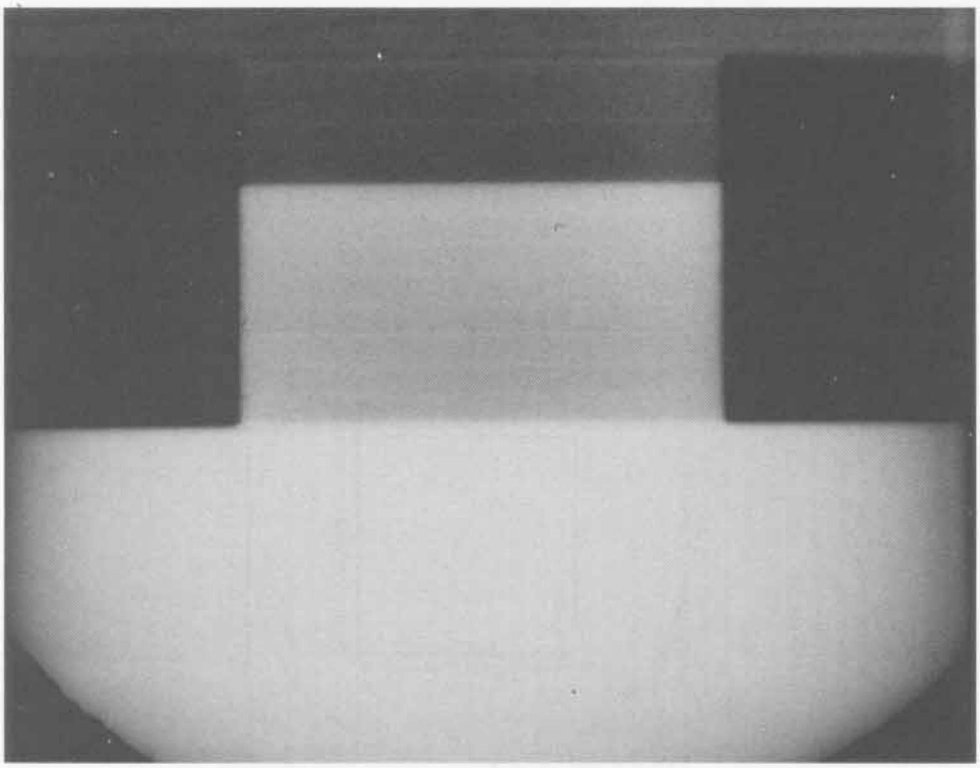


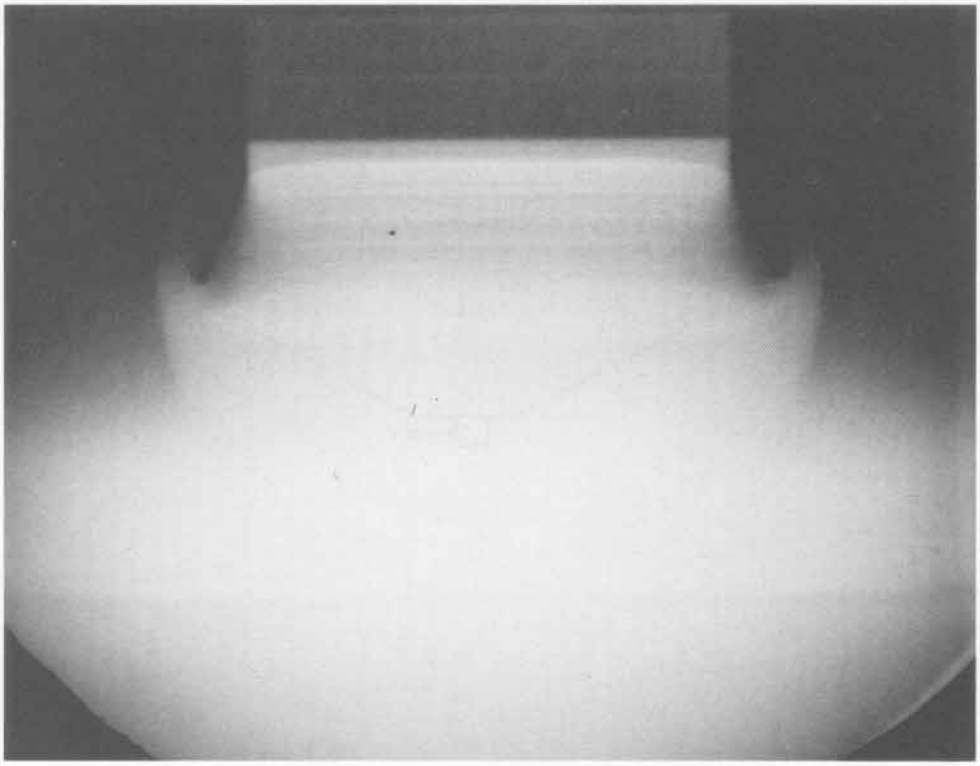


SHOT 1252: **Baratol with Embedded Tantalum Foils**
Date: October 13, 1970
Experimenter: Douglas Venable
Radiographic Time: 42.86 μs

Eight slabs of 6.35-mm-thick Baratol separated by 0.0127-mm-thick tantalum foils were initiated by 50.8 mm of Baratol and a P-081 lens.

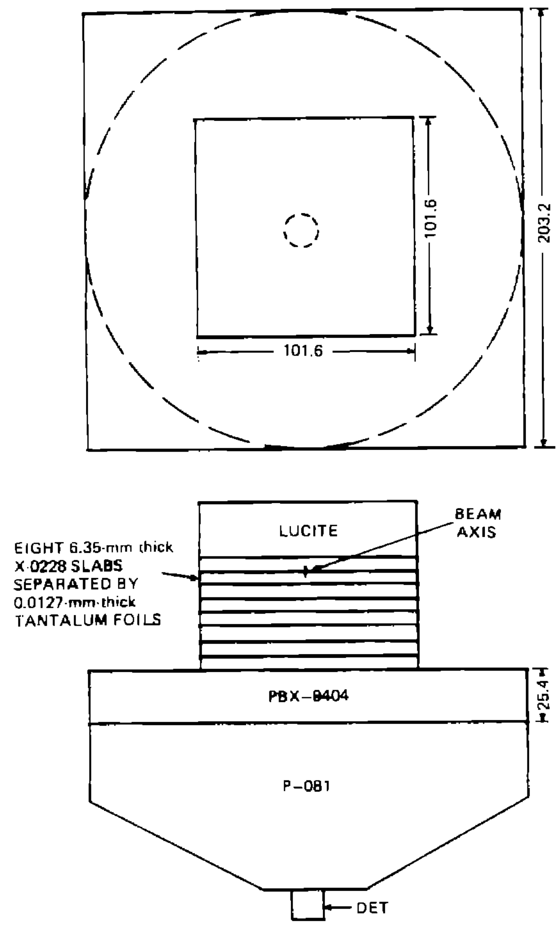


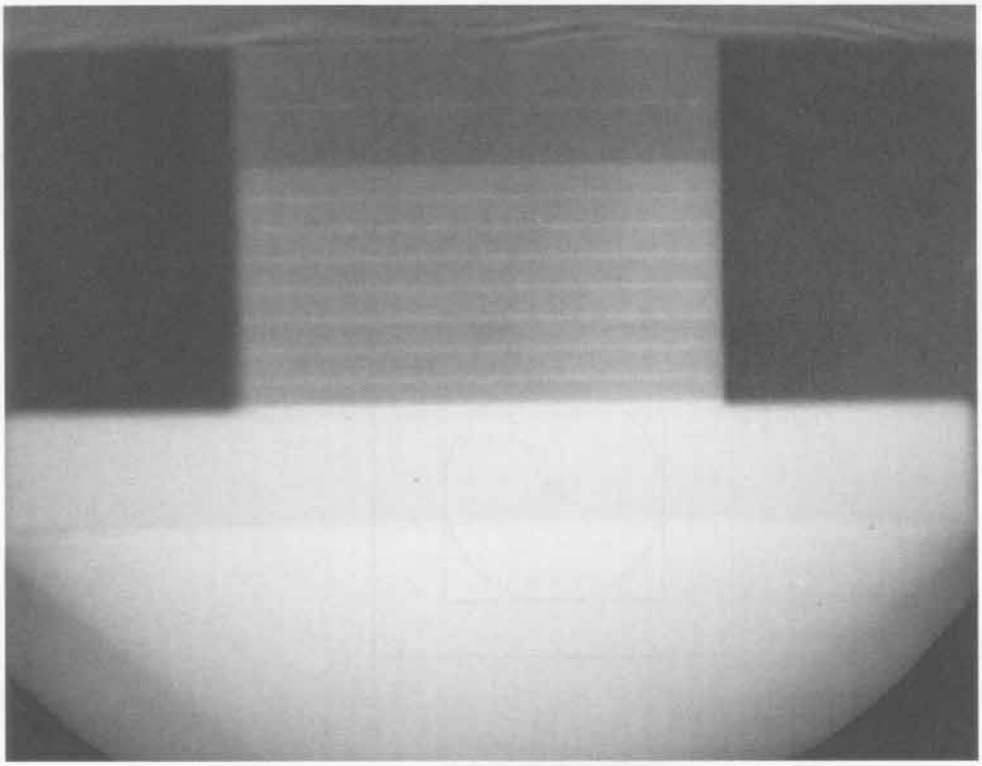


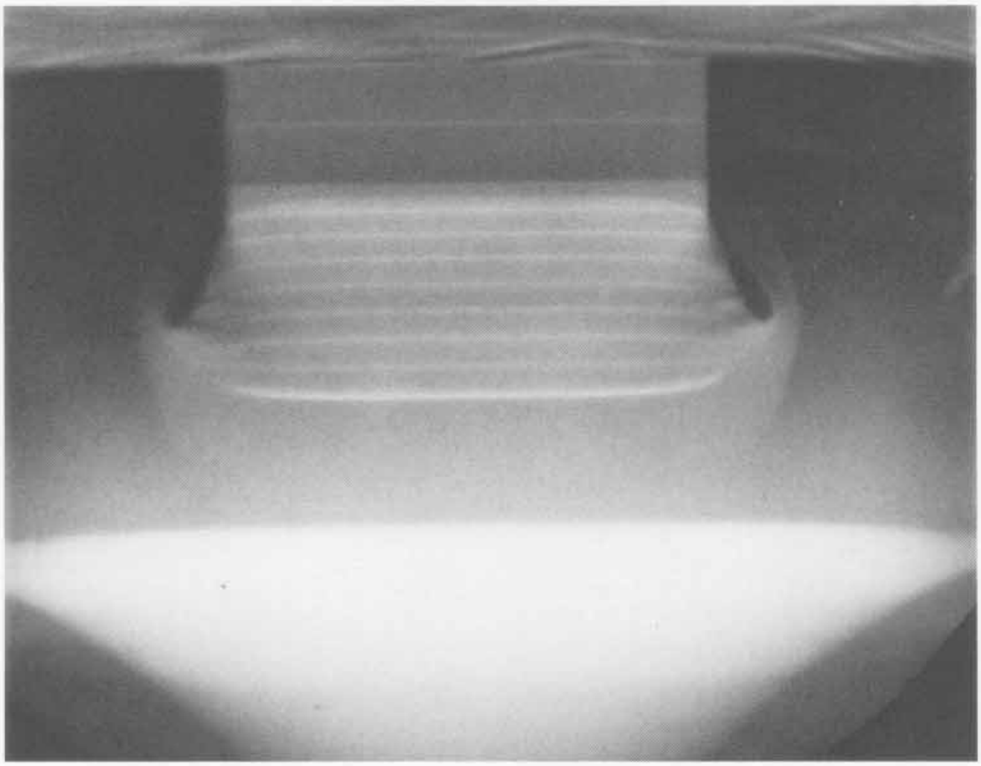


SHOT 1253: **Nitroguanidine with Embedded Tantalum Foils**
Date: October 13, 1970
Experimenter: Douglas Venable
Radiographic Time: 31.44 μs

Eight slabs of 6.35-mm-thick X0228 (95/5 wt% nitroguanidine and Estane at 1.703 g/cm^3) separated by 0.0127-mm-thick tantalum foils were initiated by 25.4 mm of PBX-9404 and a P-081 lens.

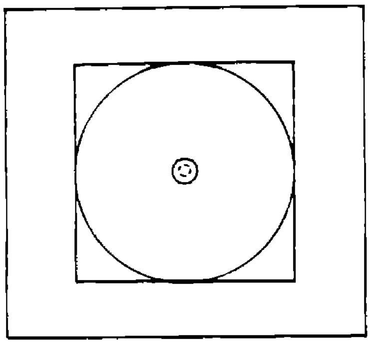


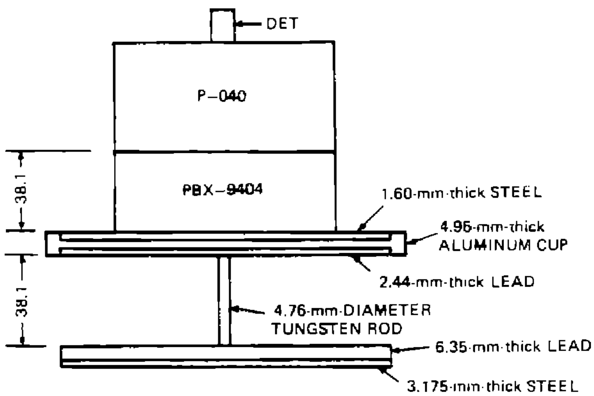


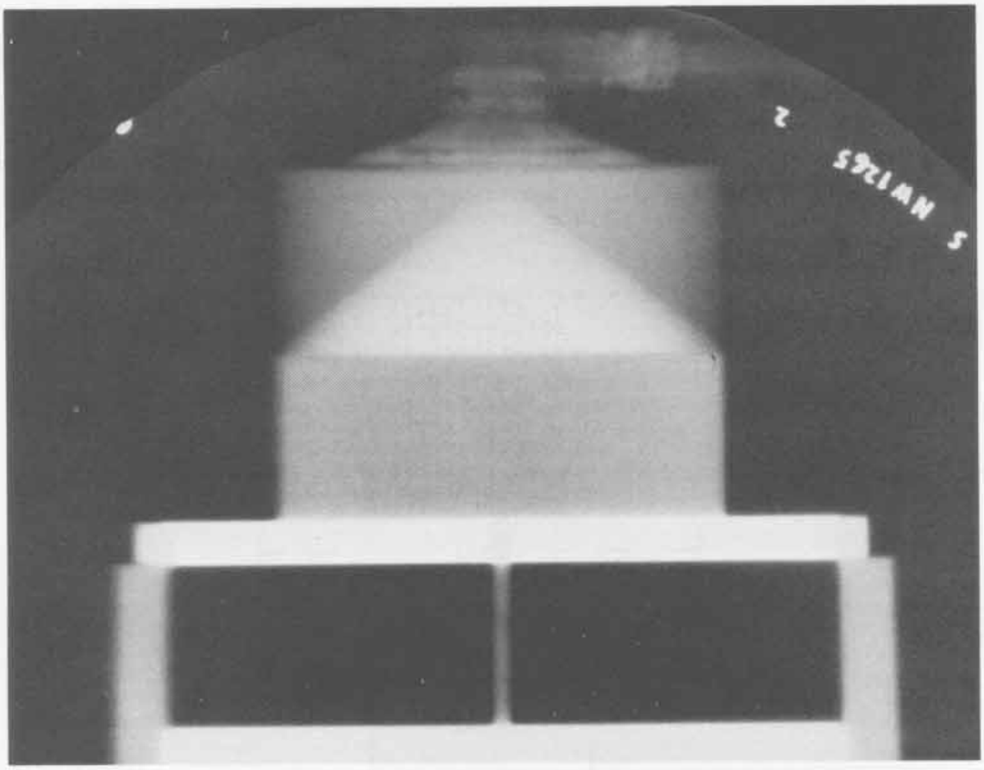


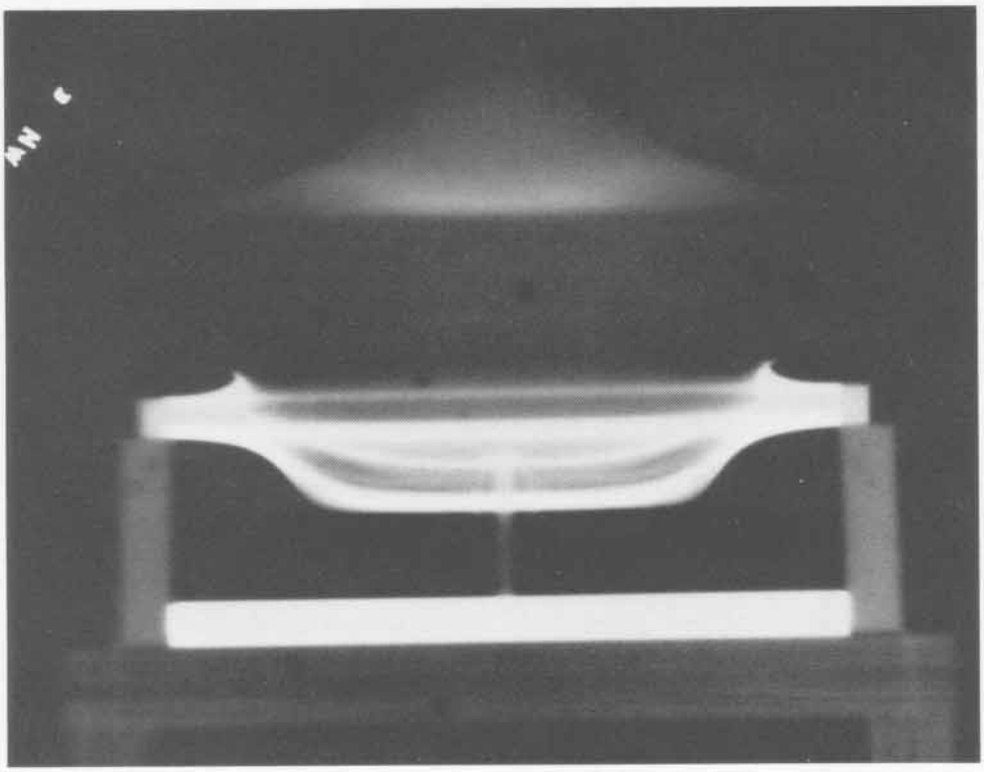
SHOT 1265: **Tungsten Rod Penetration**
Date: November 10, 1970
Experimenter: Robert E. Stapleton
Radiographic Time: 27.97 μs

The interaction of three metal plates, which were driven by 38.1 mm of PBX-9404 initiated by a P-040 lens with a 4.76-mm-diameter tungsten rod. The metal plates were 1.60-mm-thick steel, 4.95-mm-thick aluminum, and 2.44-mm-thick lead.

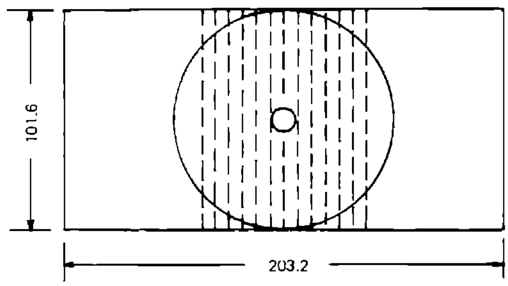


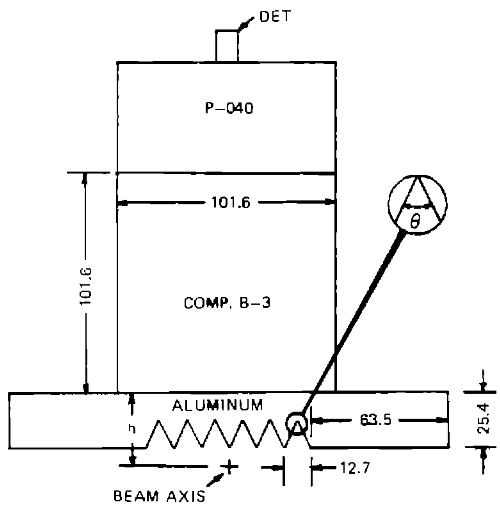


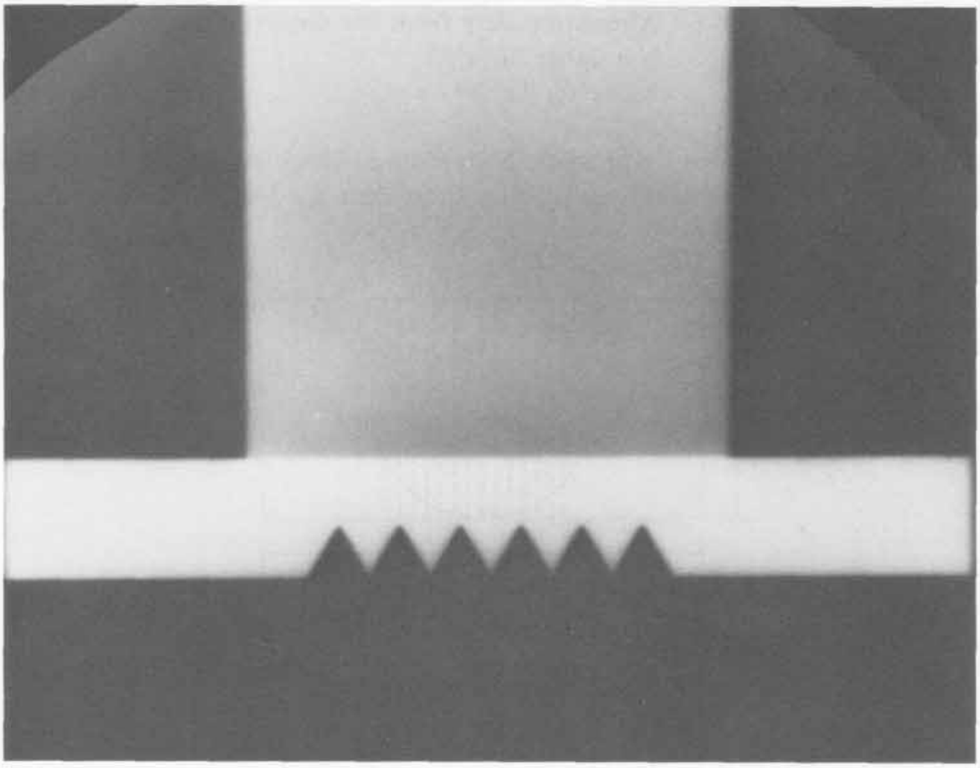


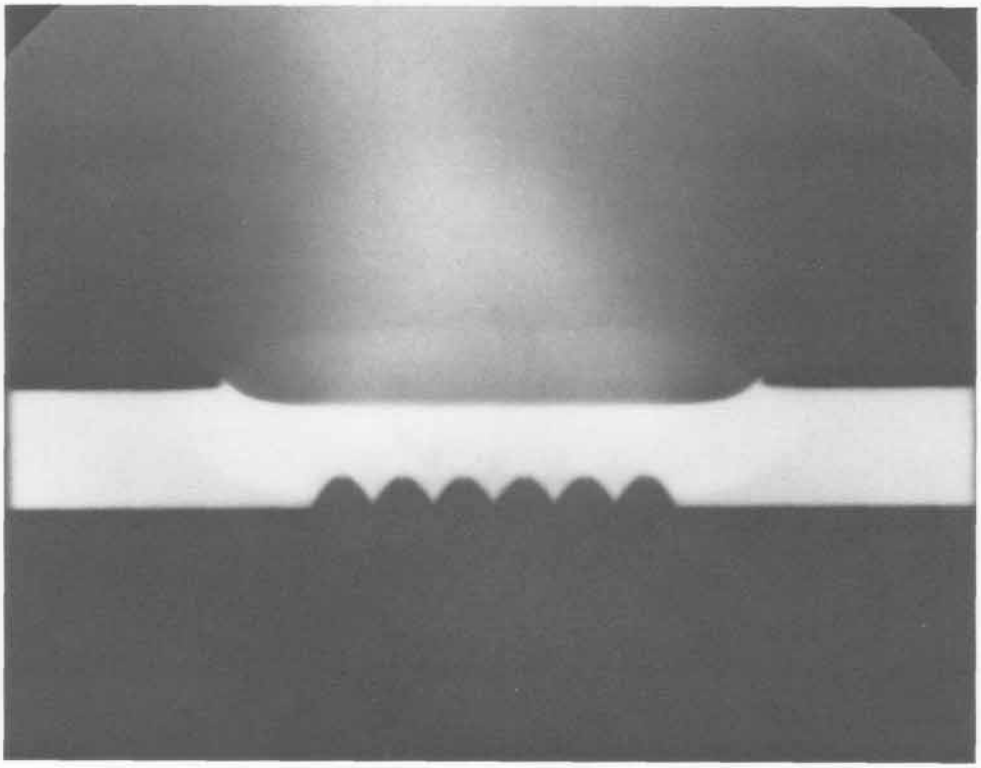


SHOT 1276: **Aluminum Jets from 60° Grooves**
Date: November 10, 1970
Experimenter: Roger W. Taylor
Radiographic Time: 29.62 μs
Metallic jets were formed. The explosively induced shock wave in the aluminum plate interacted with the 60°, θ, grooves, to produce the jets. h was 24.17 mm.



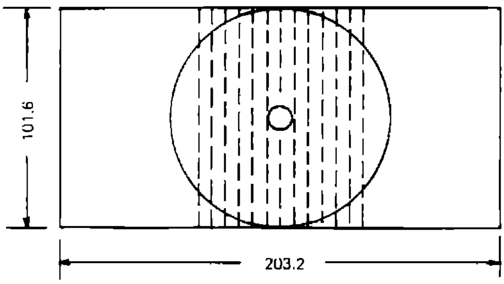


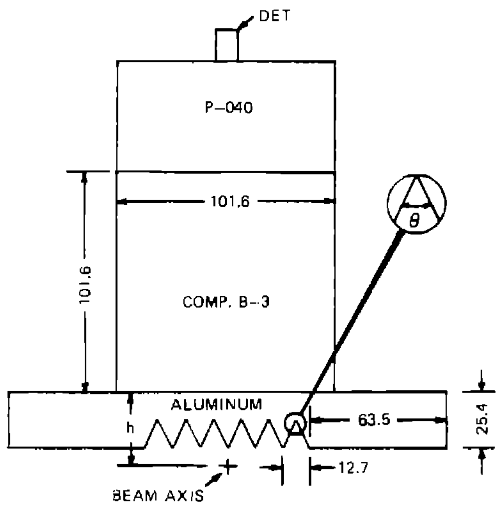


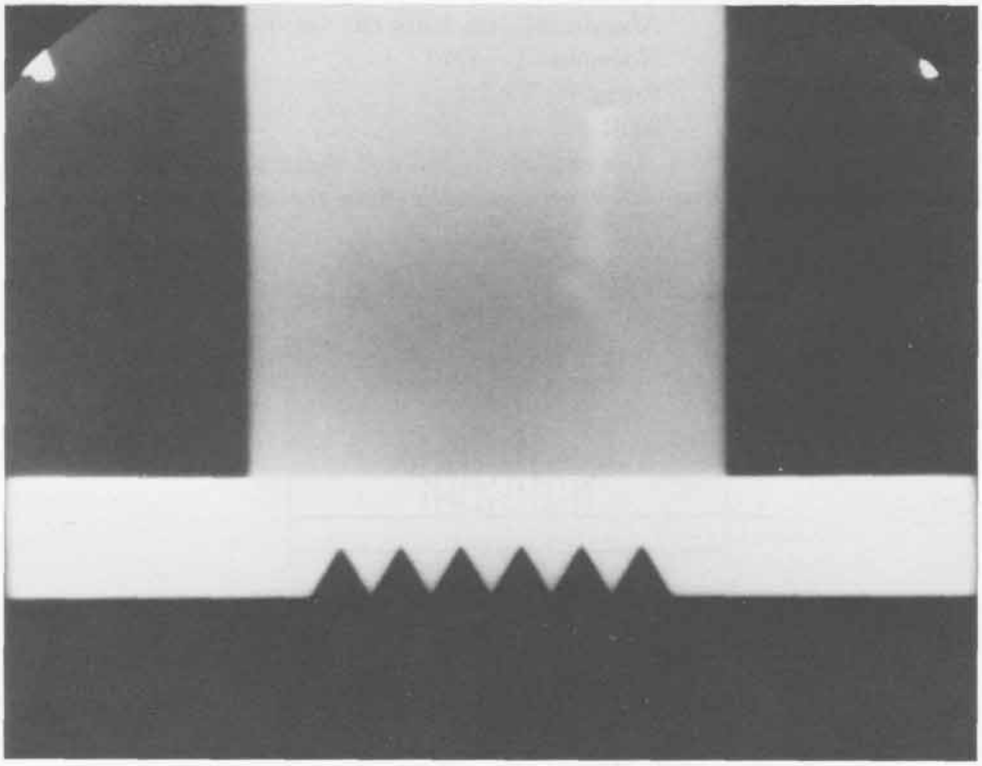


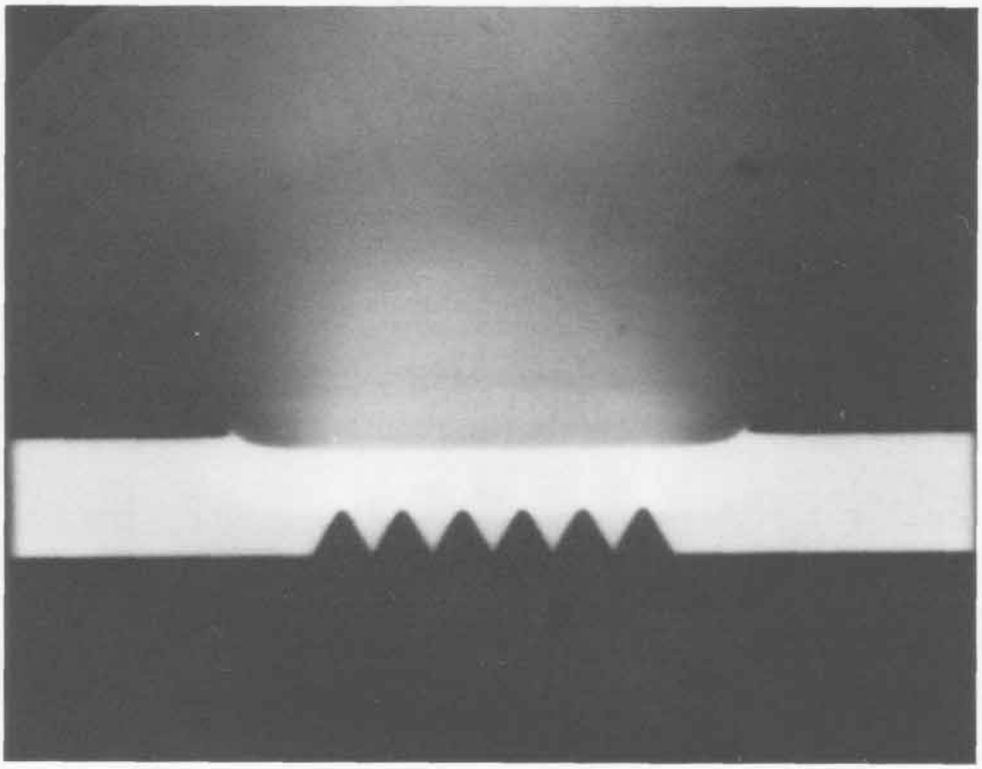
SHOT 1277: **Aluminum Jets from 60° Grooves**
Date: November 11, 1970
Experimenter: Roger W. Taylor
Radiographic Time: 28.73 μs

Metallic jets were formed. The explosively induced shock wave in the aluminum plate interacted with the 60°, θ, grooves, to produce the jets. h was 17.48 mm.



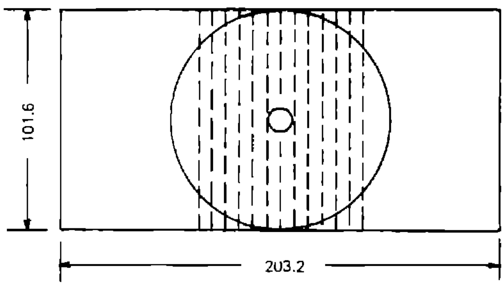


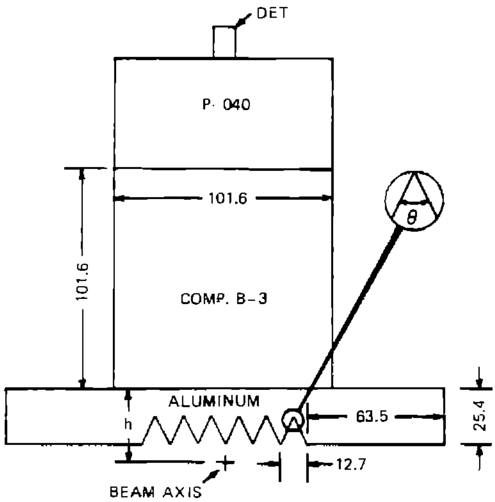


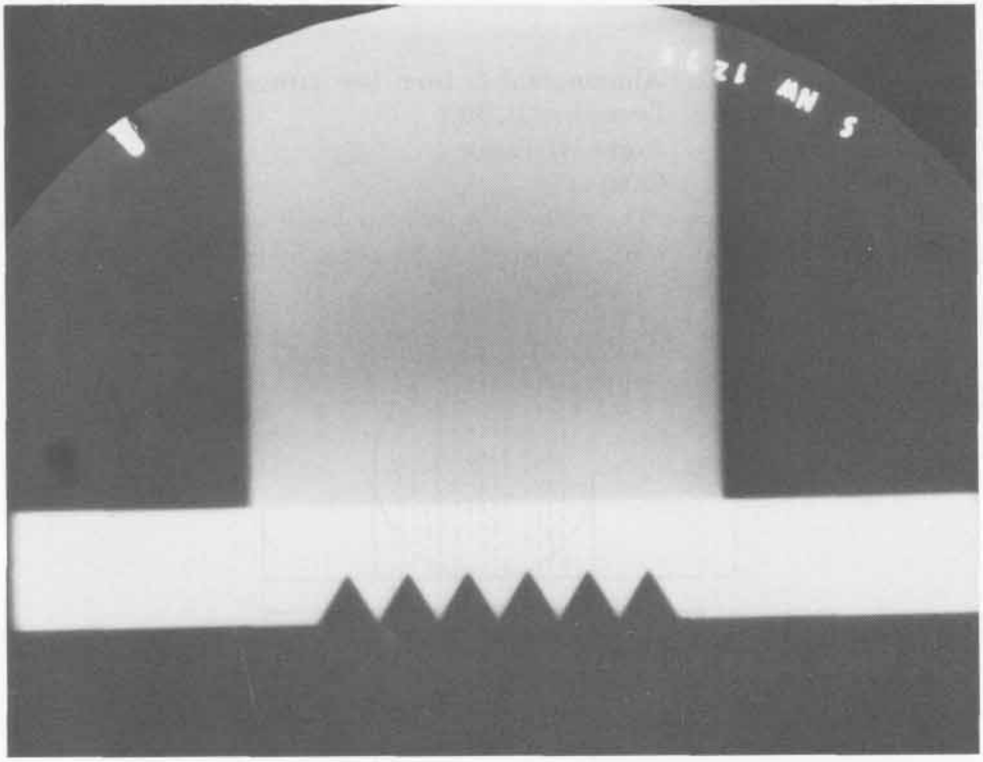


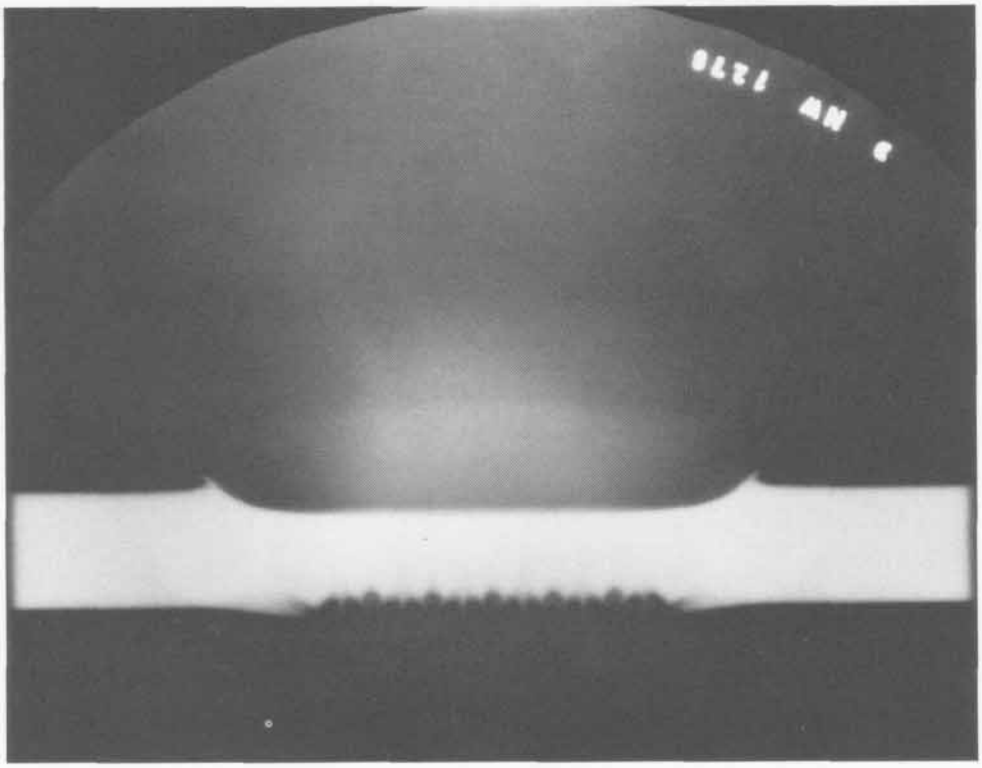
SHOT 1278: **Aluminum Jets from 60° Grooves**
Date: November 11, 1970
Experimenter: Roger W. Taylor
Radiographic Time: 30.91 μs

Metallic jets were formed. The explosively induced shock wave in the aluminum plate interacted with the 60°, θ, grooves, to produce the jets. h was 30.0 mm.



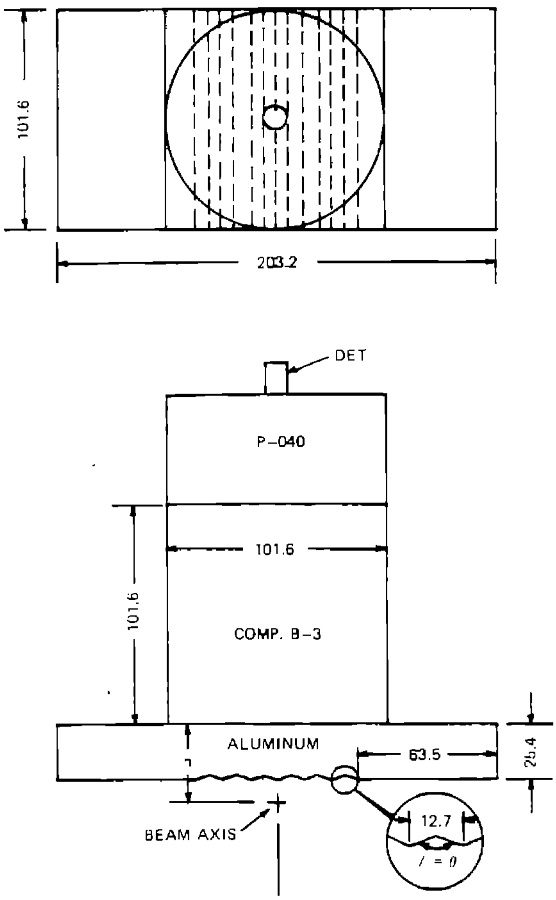


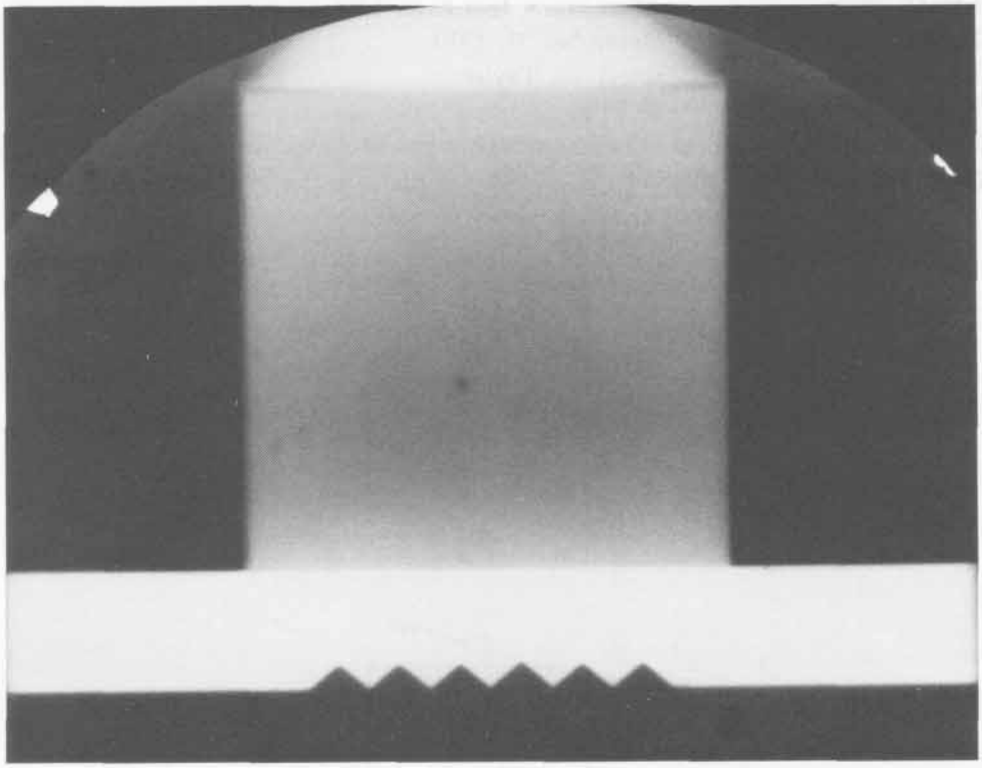


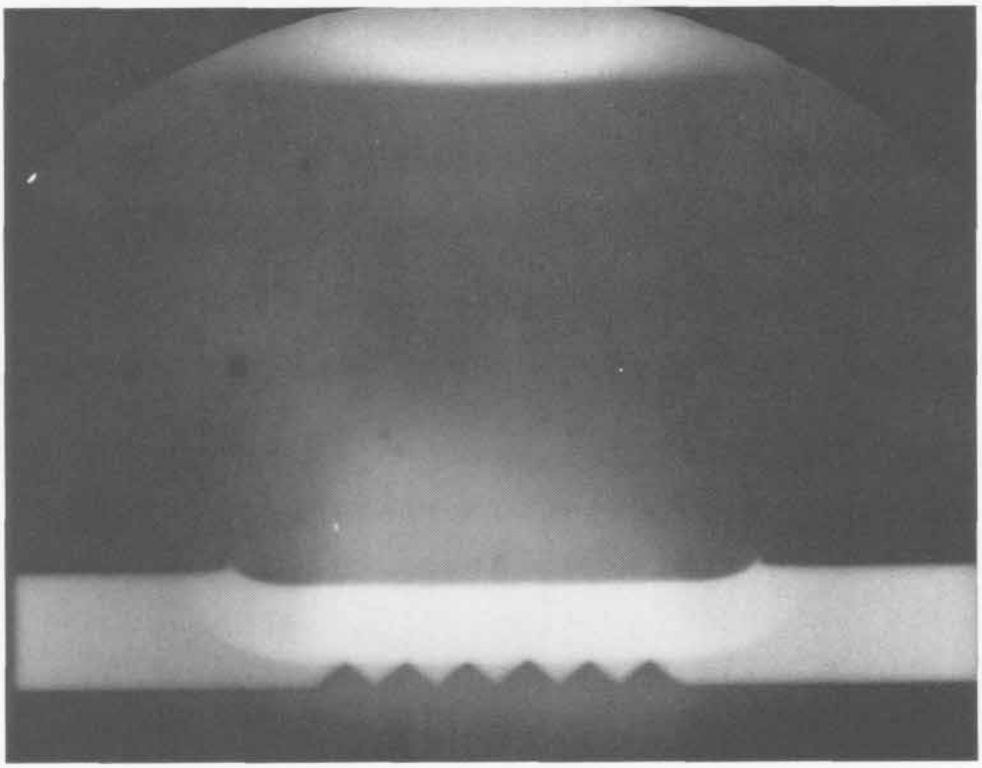


SHOT 1283: **Aluminum Jets from 100° Grooves**
Date: December 31, 1970
Experimenter: Roger W. Taylor
Radiographic Time: 29.09 μs

Metallic jets were formed. The explosively induced shock wave in the aluminum plate interacted with the 100°, θ, grooves, to produce the jets. h was 20.06 mm.

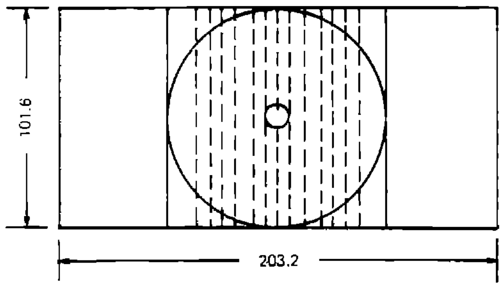


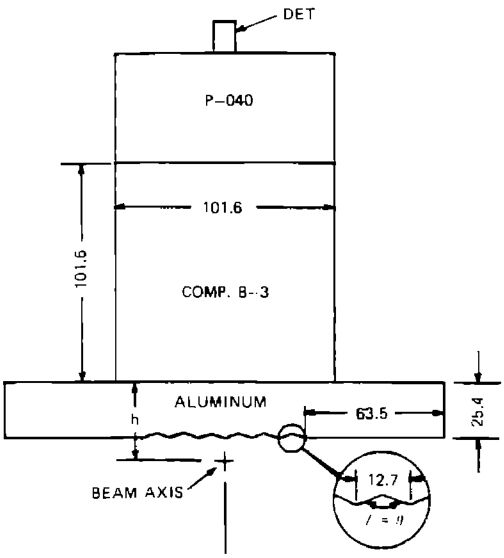


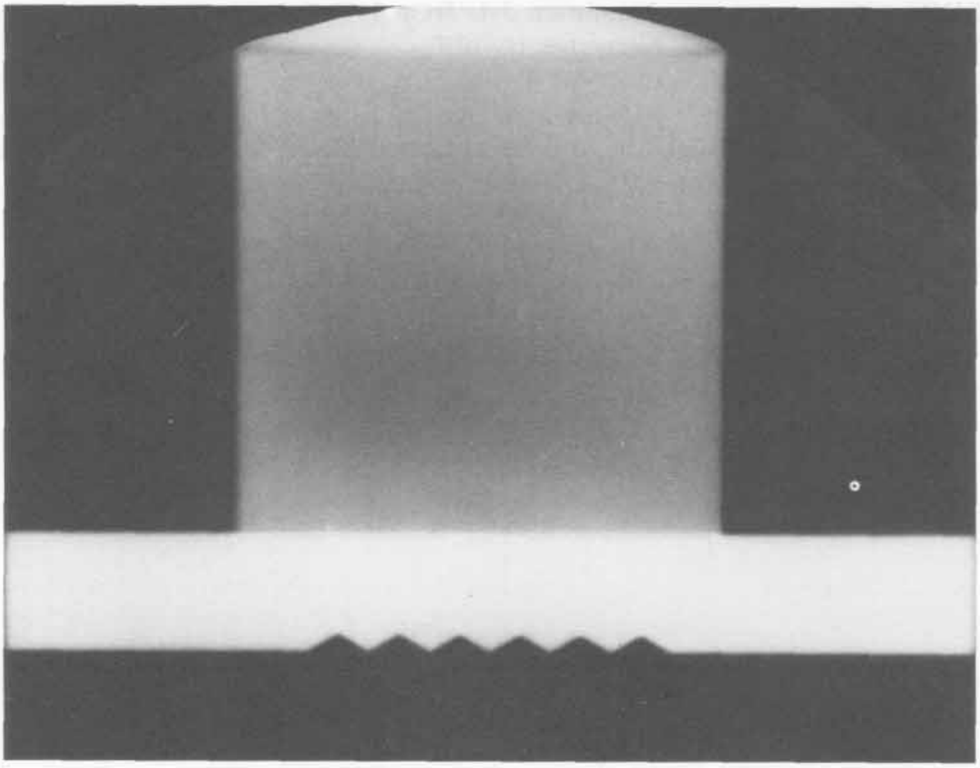


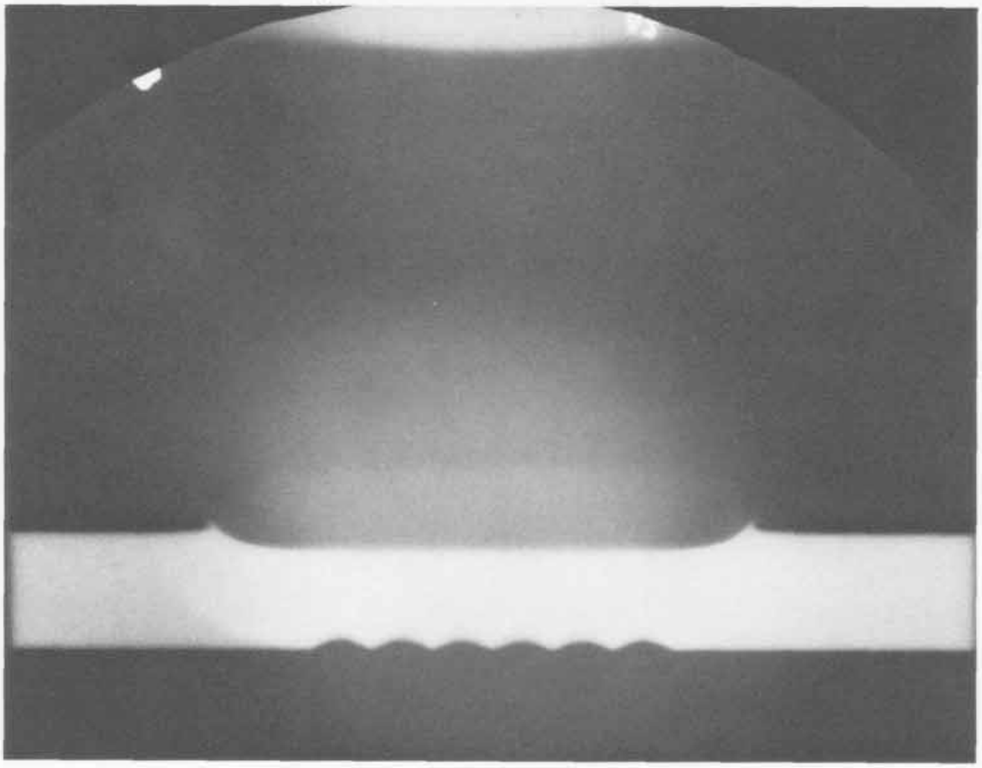
SHOT 1287: **Aluminum Jets from 120° Grooves**
Date: December 31, 1970
Experimenter: Roger W. Taylor
Radiographic Time: 29.89 μs

Metallic jets were formed. The explosively induced shock wave in the aluminum plate interacted with the 120°, θ, grooves, to produce the jets. h was 26.0 mm.



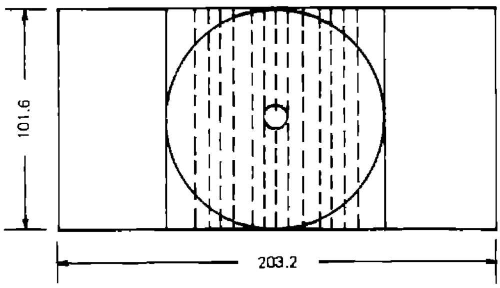


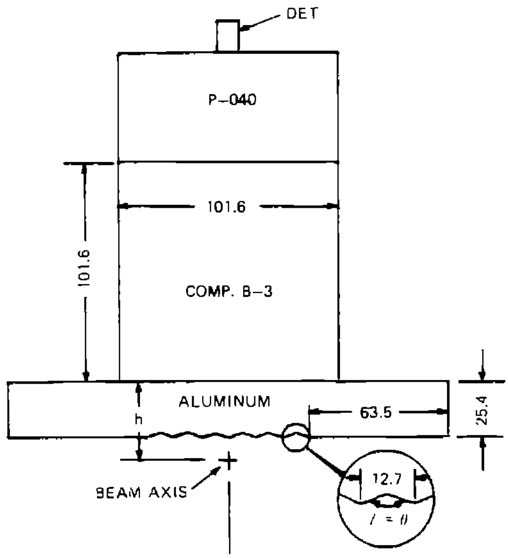


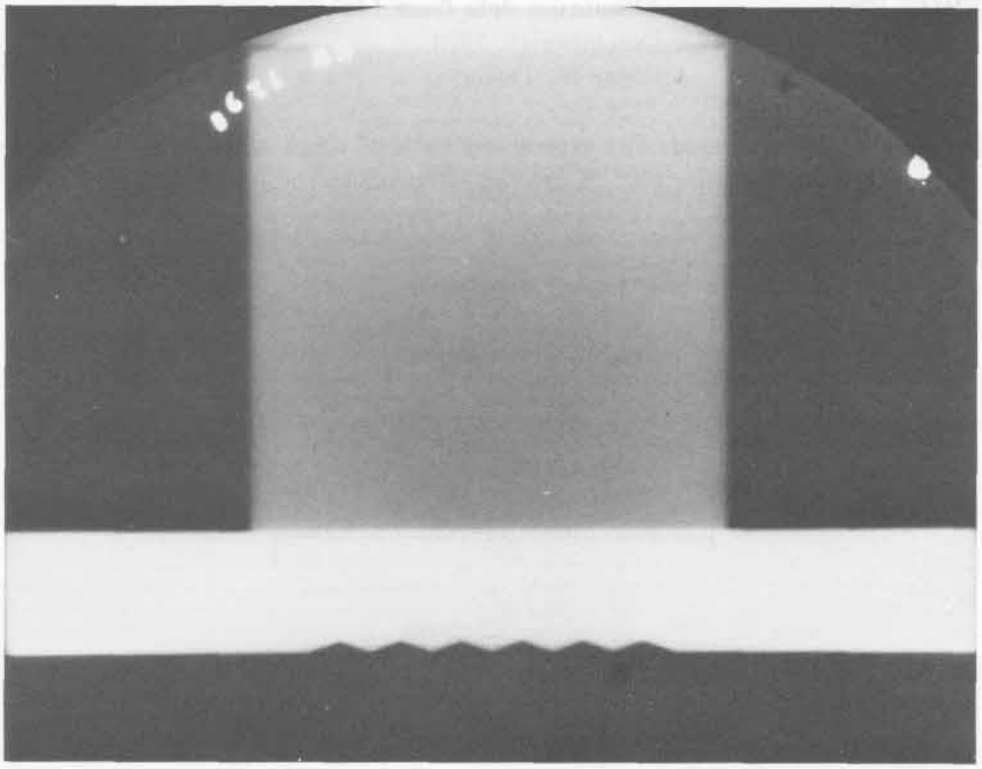


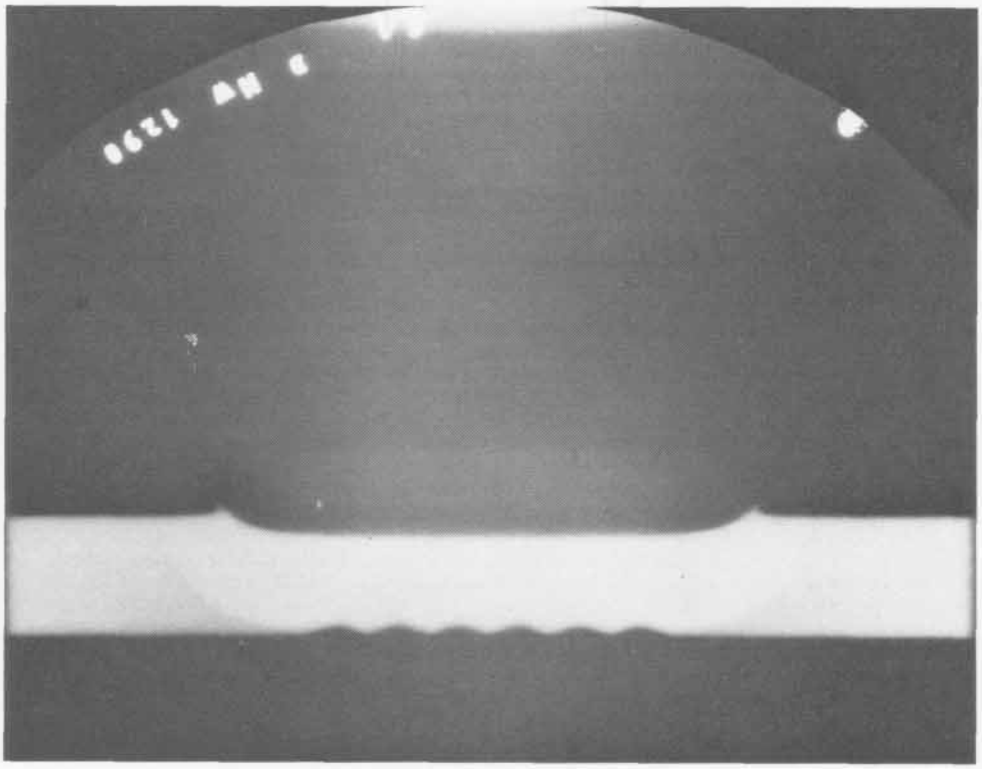
SHOT 1290: **Aluminum Jets from 140° Grooves**
Date: November 11, 1970
Experimenter: Roger W. Taylor
Radiographic Time: 29.90 μs

Metallic jets were formed. The explosively induced shock wave in the aluminum plate interacted with the 140°, θ, grooves, to produce the jets. h was 25.7 mm.



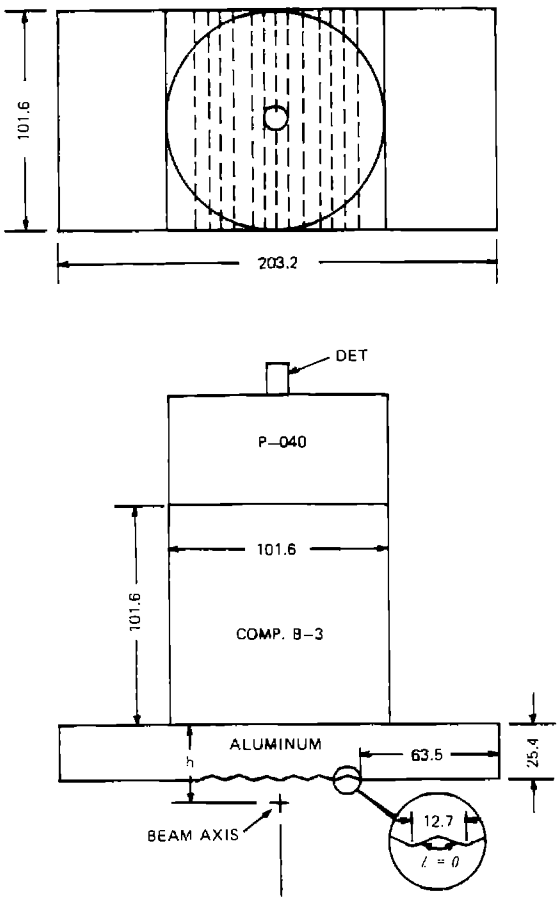


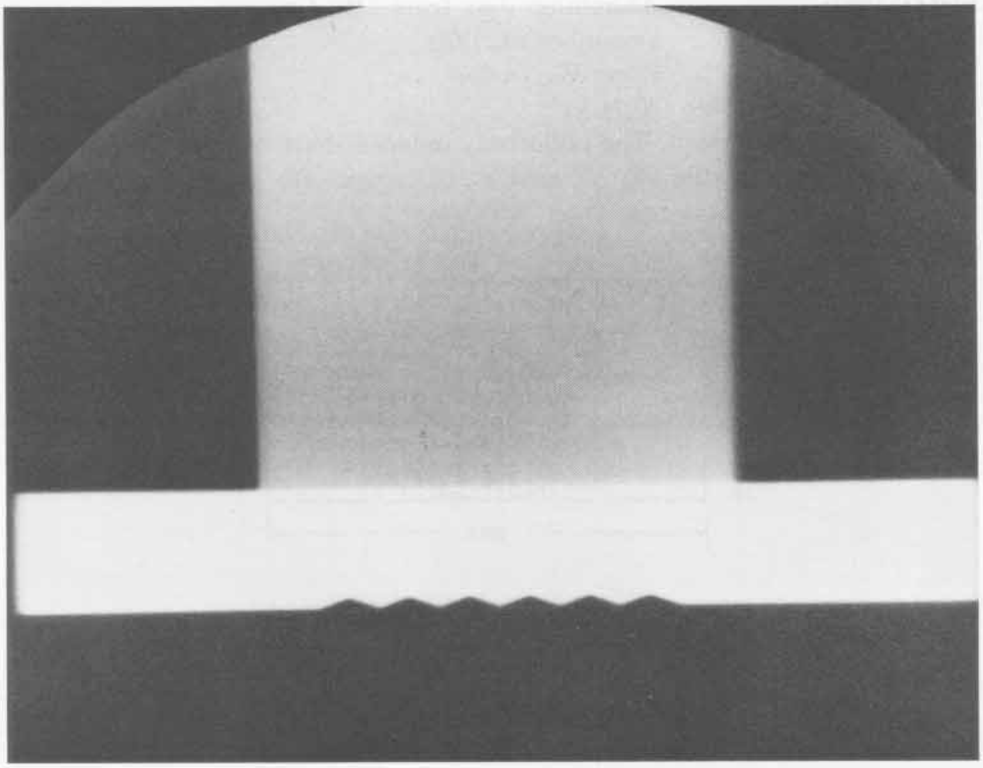


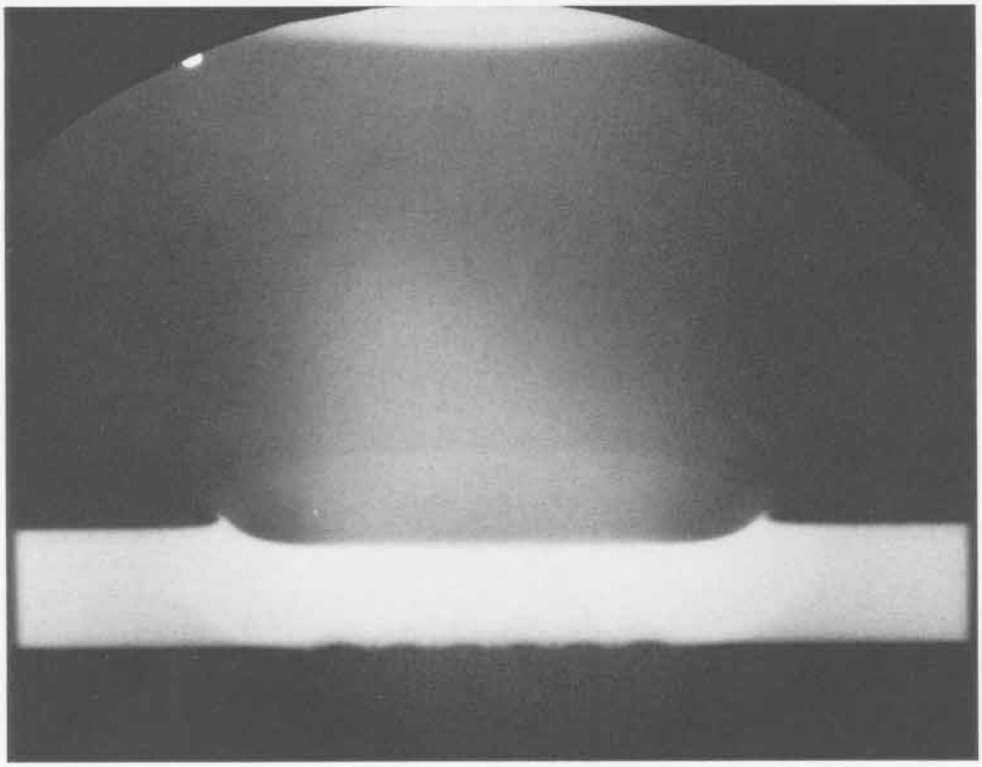


SHOT 1291:	**Aluminum Jets from 140° Grooves**
Date:	December 16, 1970
Experimenter:	Roger W. Taylor
Radiographic Time:	30.35 μs

Metallic jets were formed. The explosively induced shock wave in the aluminum plate interacted with the 140°, θ, grooves, to produce the jets. h was 29.7 mm.

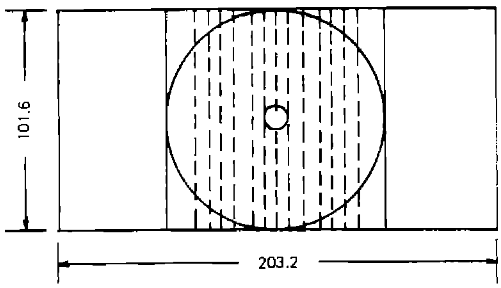


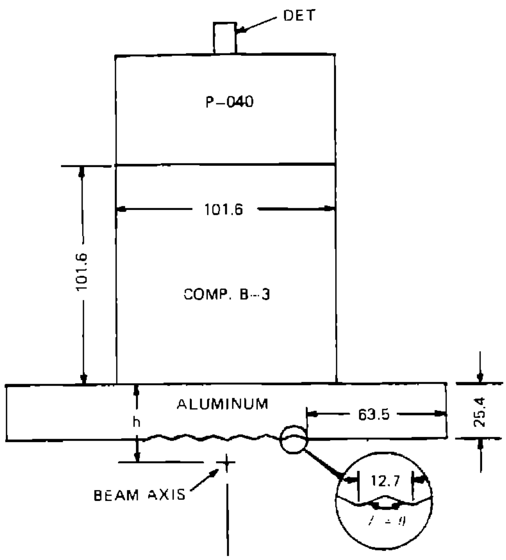


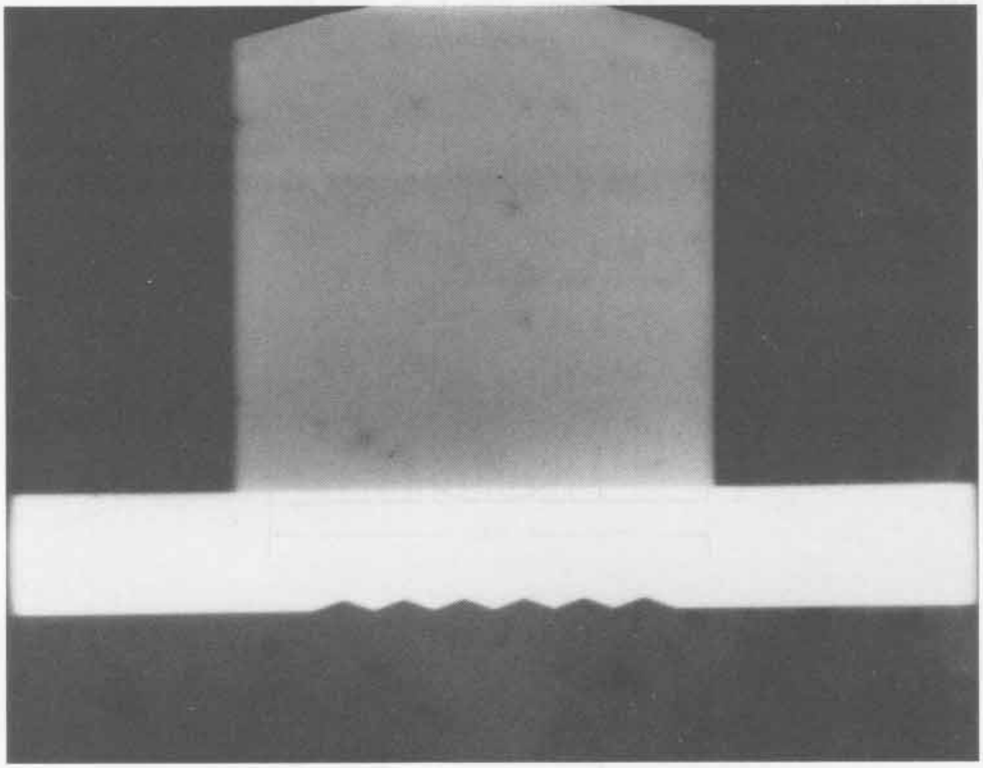


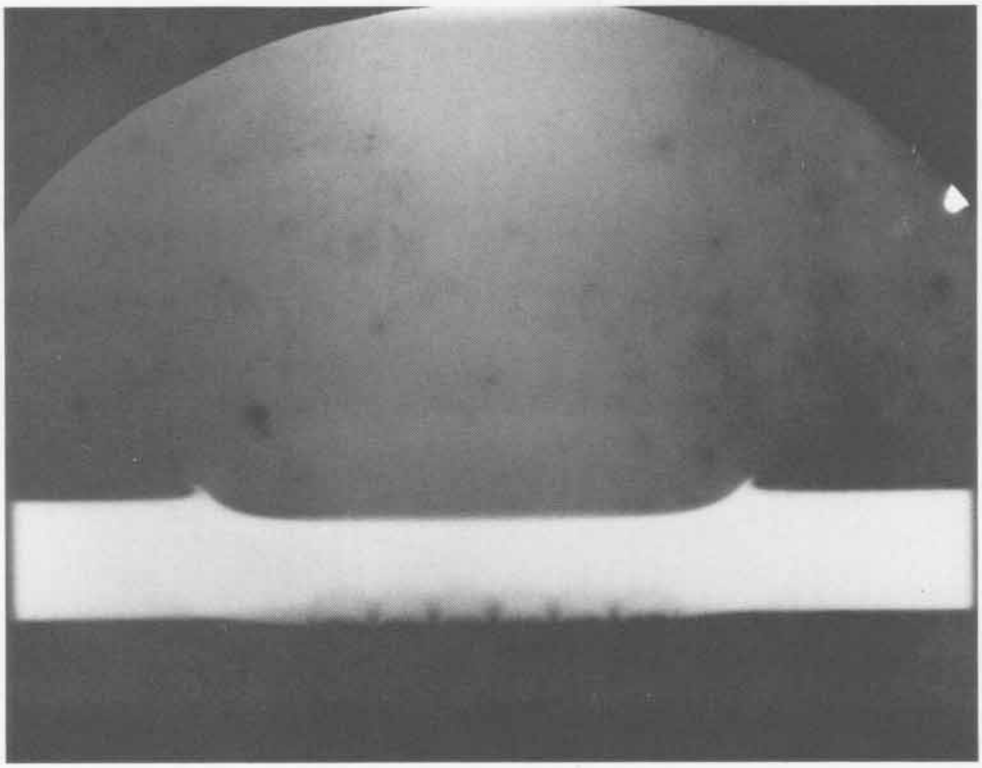
SHOT 1292: **Aluminum Jets from 140° Grooves**
Date: December 29, 1970
Experimenter: Roger W. Taylor
Radiographic Time: 30.71 μs

Metallic jets were formed. The explosively induced shock wave in the aluminum plate interacted with the 140°, θ, grooves, to produce the jets. h was 32.0 mm.



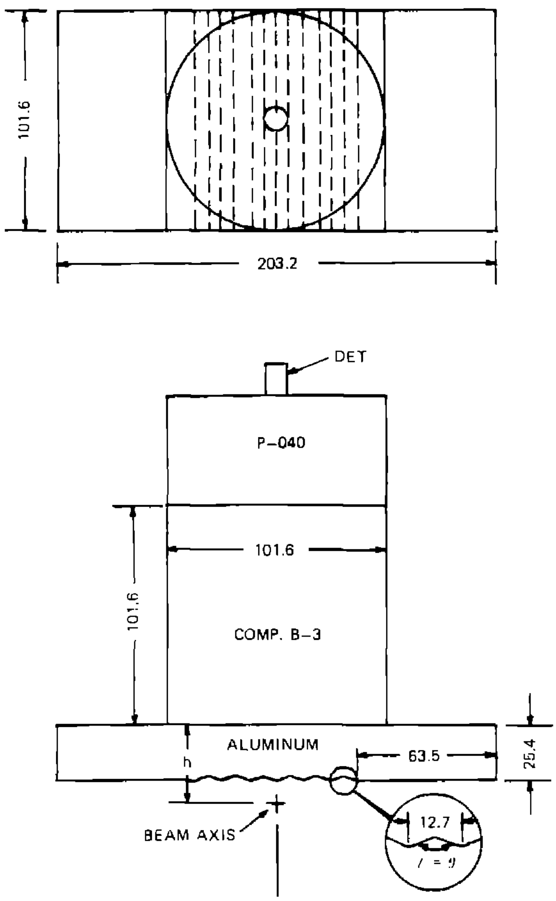


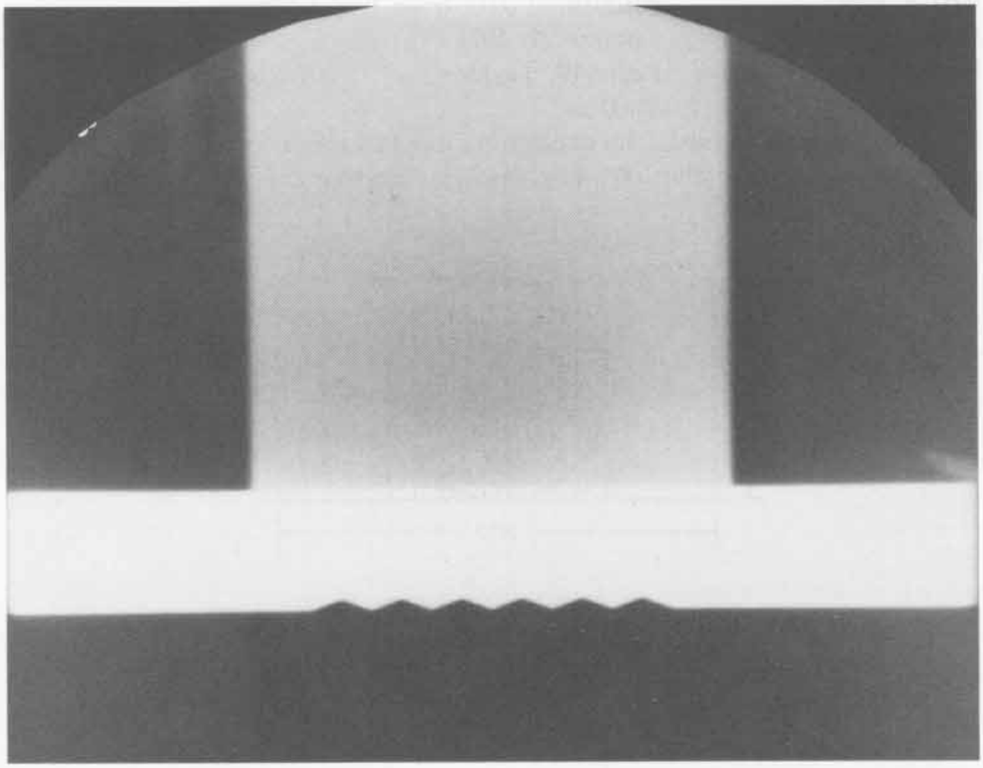


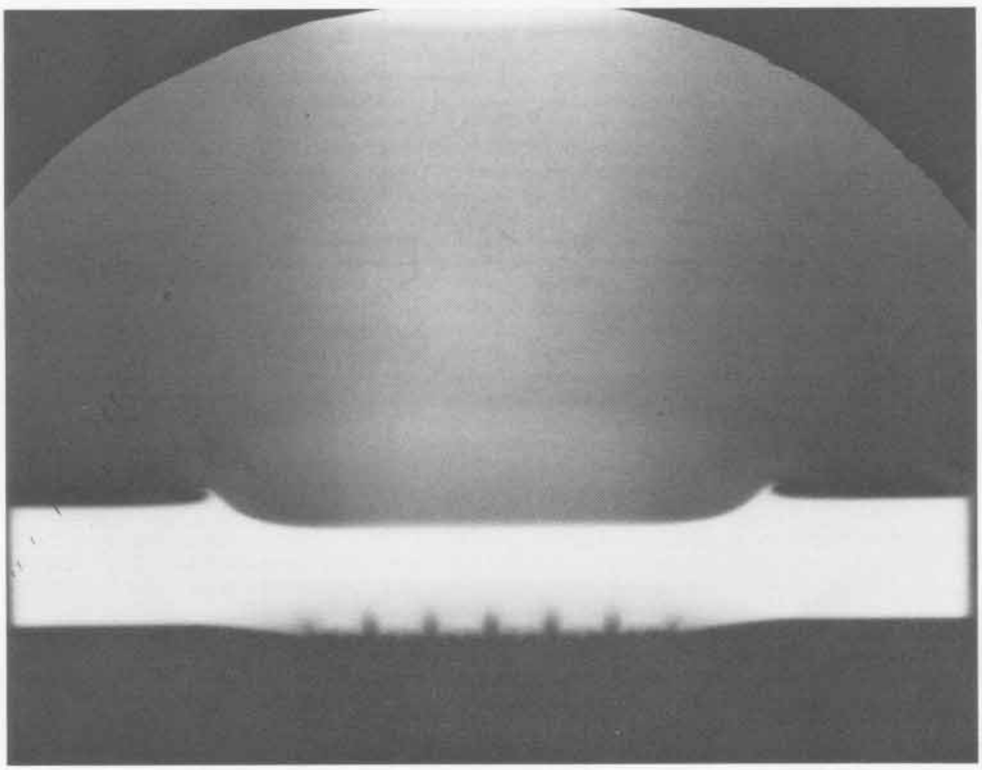


SHOT 1293: **Aluminum Jets from 140° Grooves**
Date: December 29, 1970
Experimenter: Roger W. Taylor
Radiographic Time: 31.21 μs

Metallic jets were formed. The explosively induced shock wave in the aluminum plate interacted with the 140°, θ, grooves, to produce the jets. h was 36.0 mm.

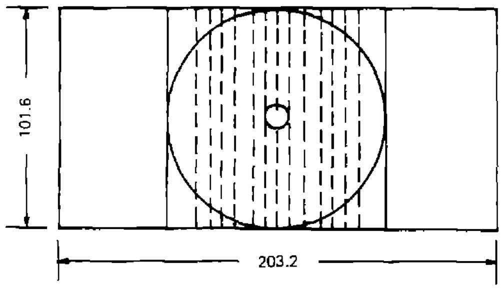


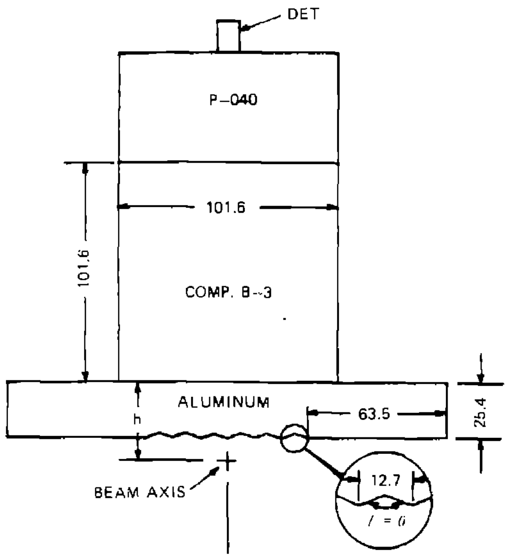


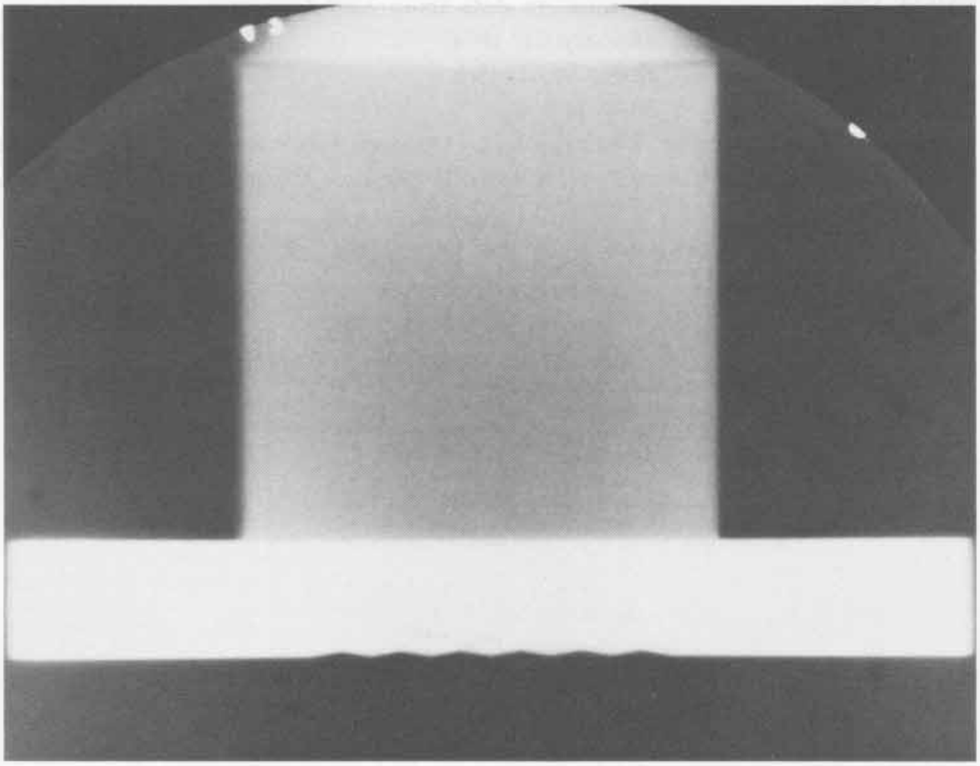


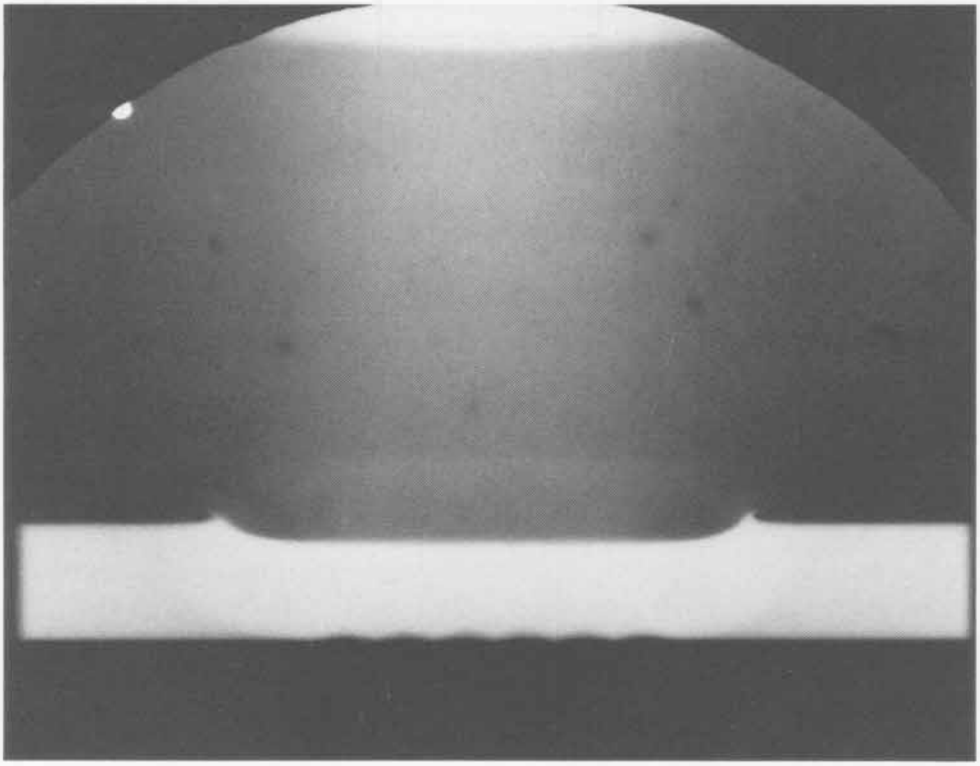
SHOT 1294: **Aluminum Jets from 160° Grooves**
Date: January 27, 1971
Experimenter: Roger W. Taylor
Radiographic Time: 30.00 μs

Metallic jets were formed. The explosively induced shock wave in the aluminum plate interacted with the 160°, θ, grooves, to produce the jets. h was 27.4 mm.



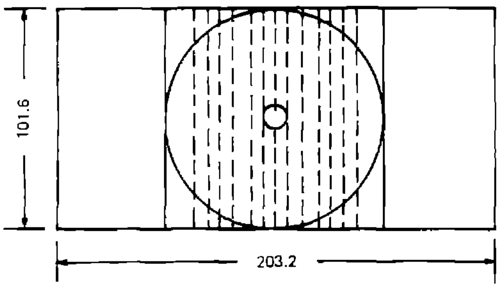


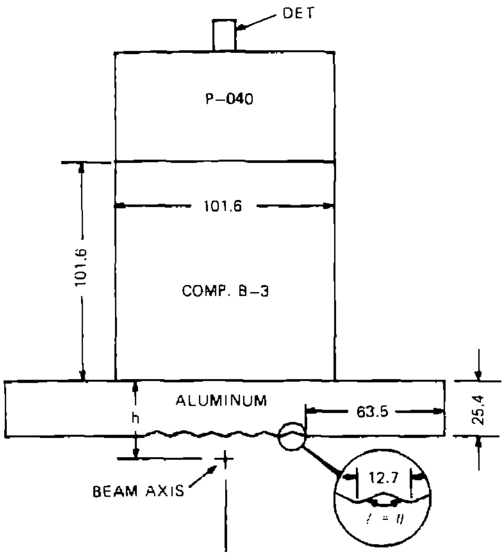


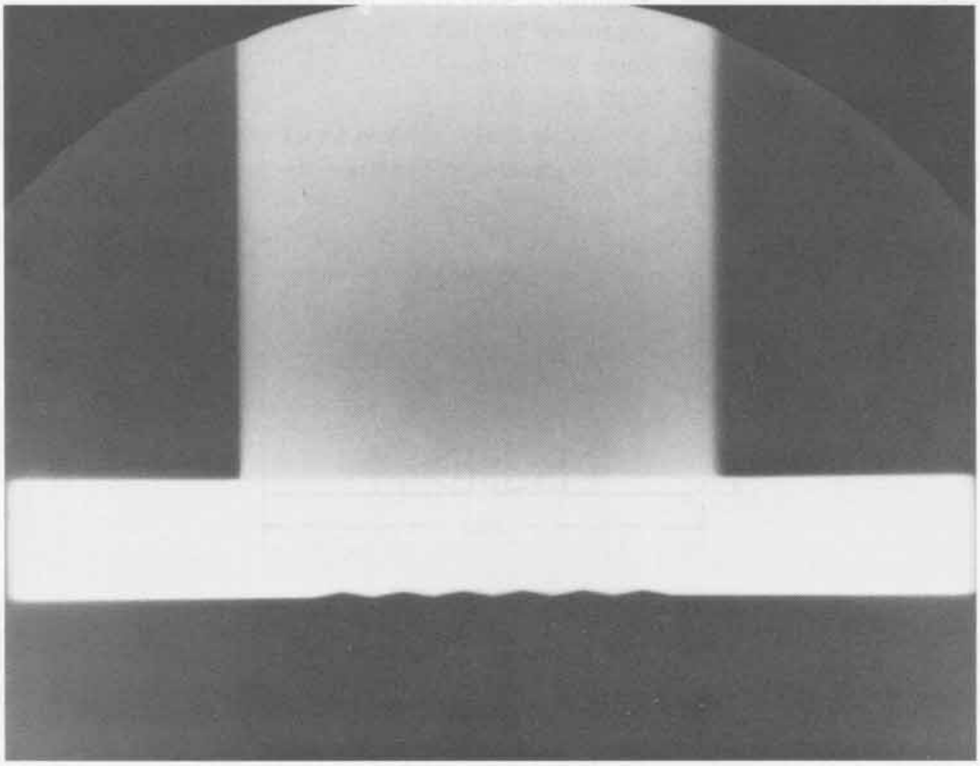


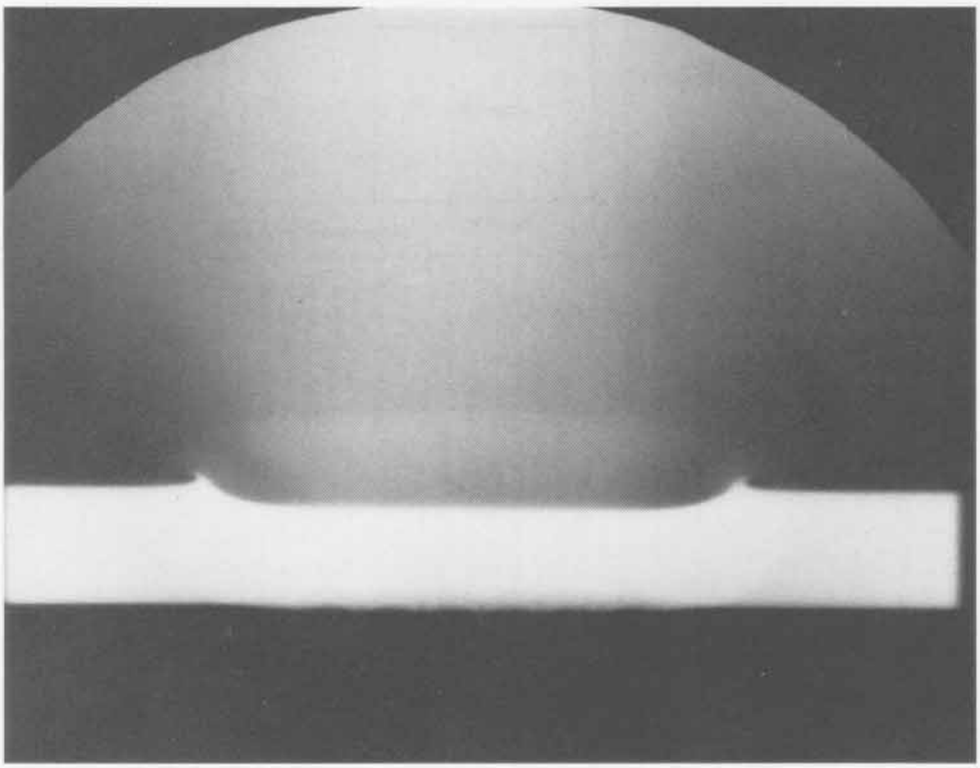
SHOT 1295: **Aluminum Jets from 160° Grooves**
Date: January 21, 1971
Experimenter: Roger W. Taylor
Radiographic Time: 30.36 μs

Metallic jets were formed. The explosively induced shock wave in the aluminum plate interacted with the 160°, θ, grooves, to produce the jets. h was 29.87 mm.



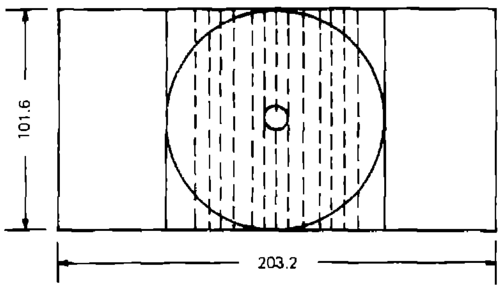


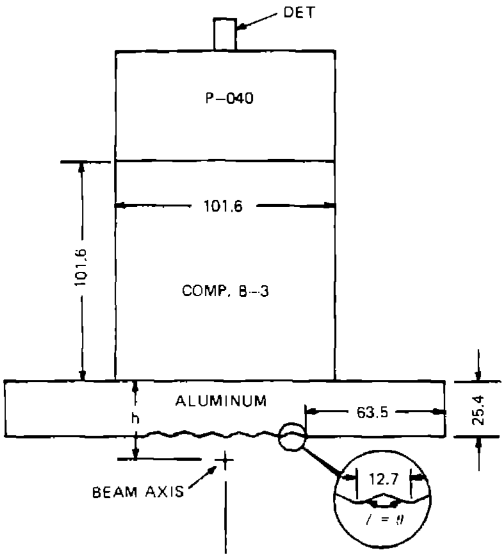


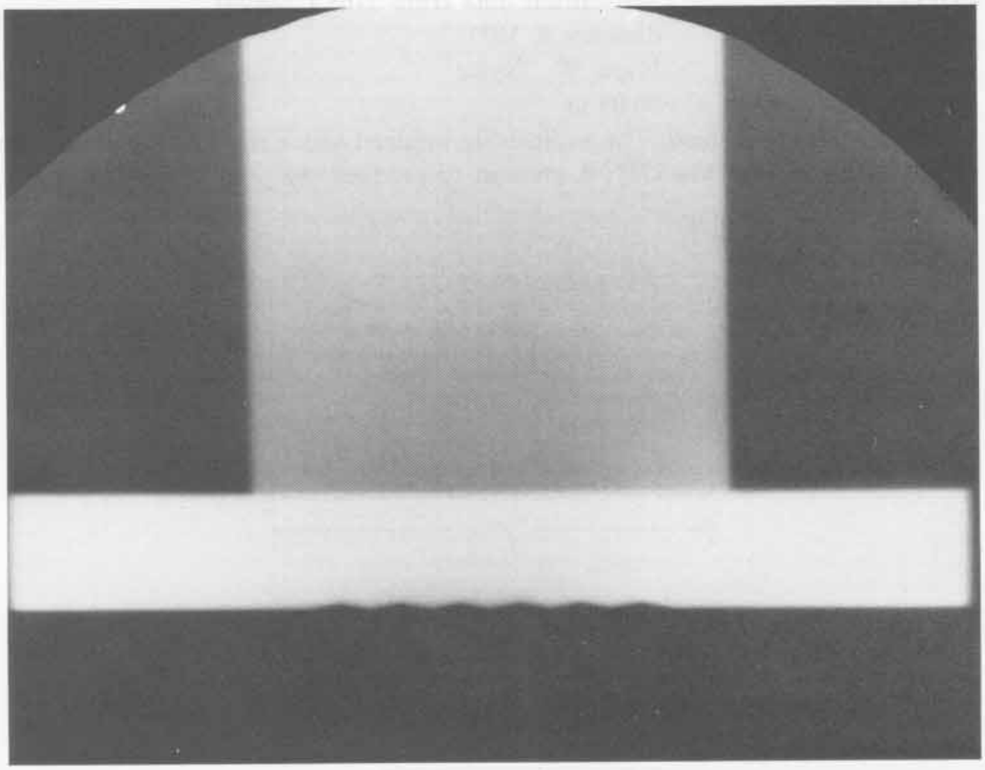


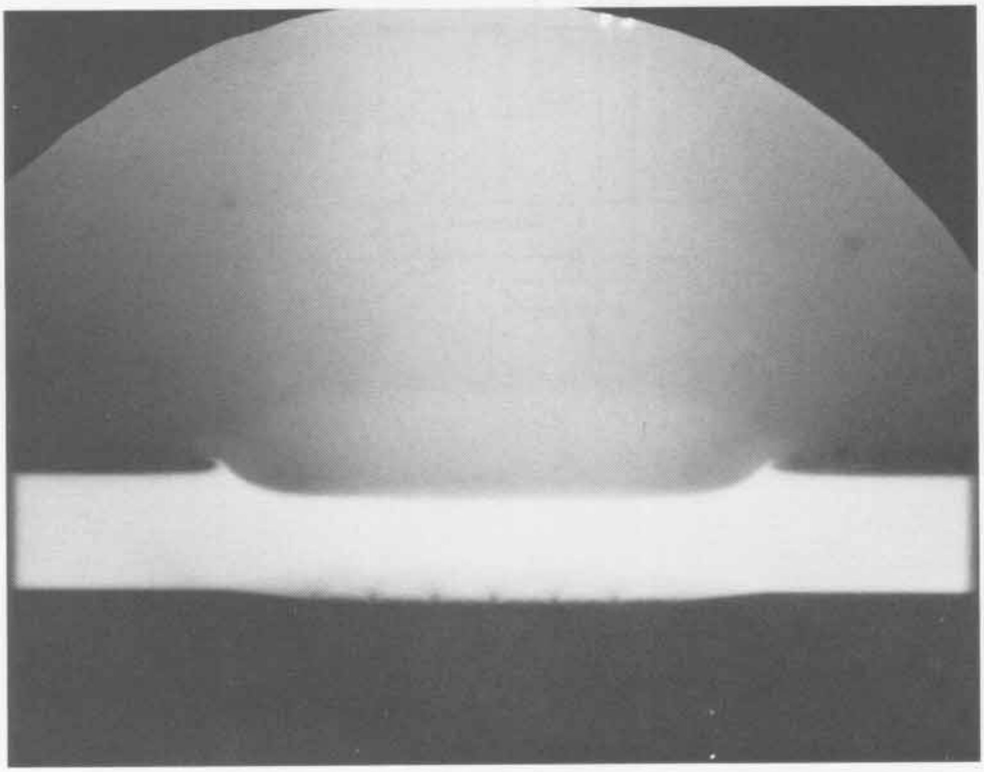
SHOT 1296: **Aluminum Jets from 160° Grooves**
Date: December 23, 1971
Experimenter: Roger W. Taylor
Radiographic Time: 30.72 μs

Metallic jets were formed. The explosively induced shock wave in the aluminum plate interacted with the 160°, θ, grooves, to produce the jets. h was 32.38 mm.



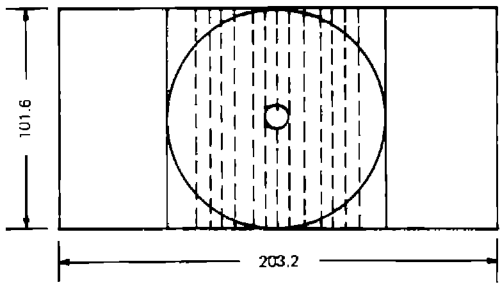


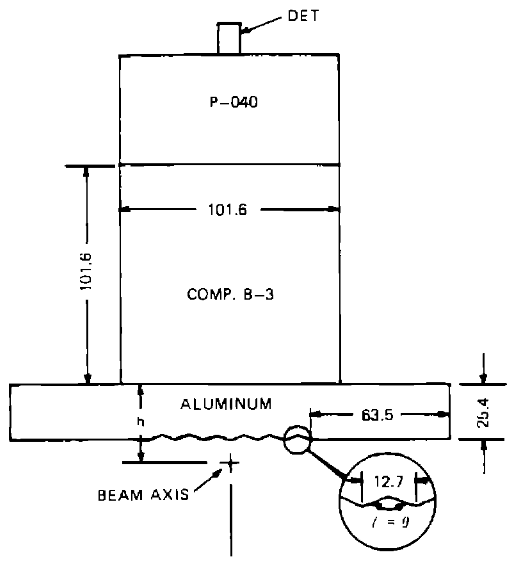


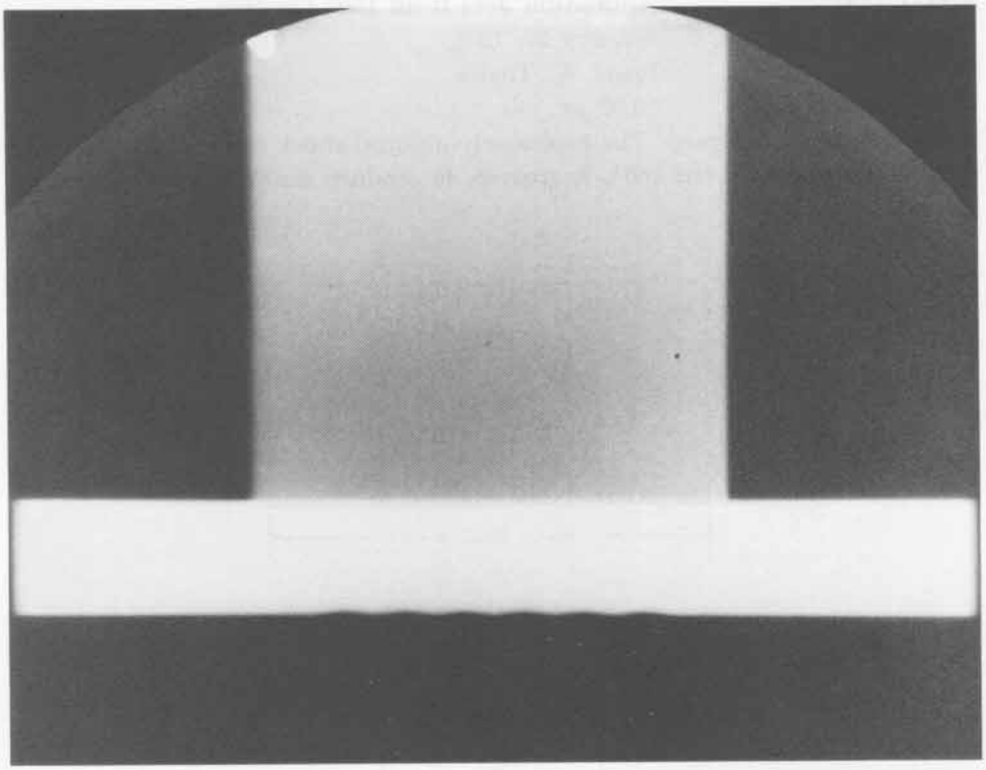


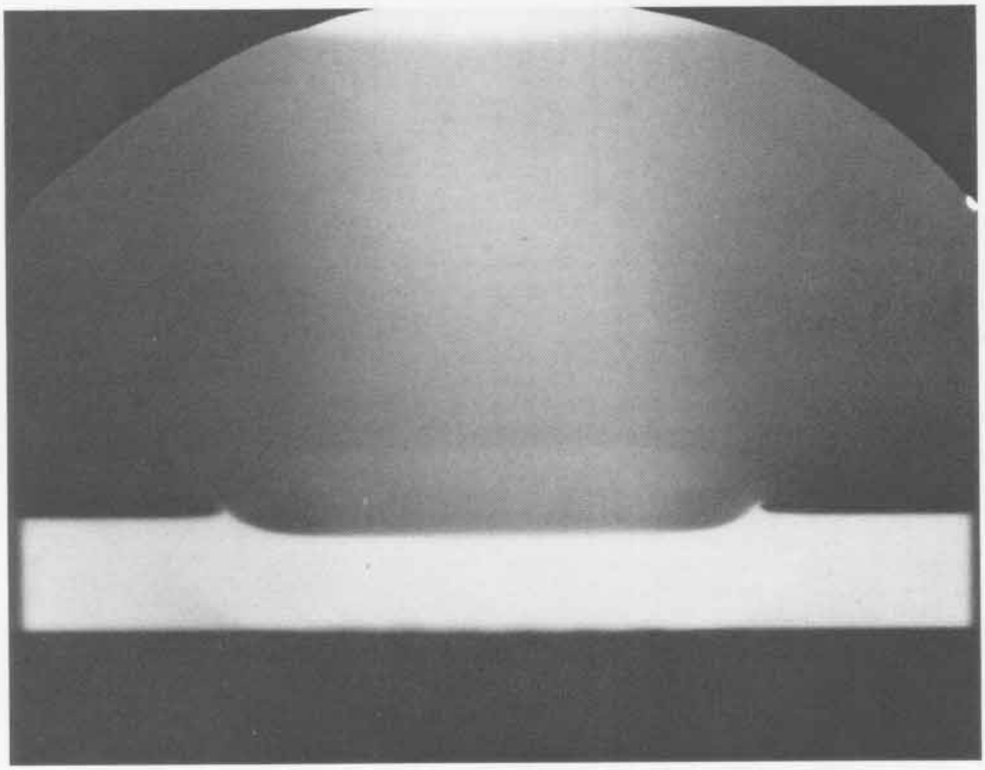
SHOT 1297: **Aluminum Jets from 170° Grooves**
Date: January 5, 1971
Experimenter: Roger W. Taylor
Radiographic Time: 30.08 μs

Metallic jets were formed. The explosively induced shock wave in the aluminum plate interacted with the 170°, θ, grooves, to produce the jets. h was 27.6 mm.



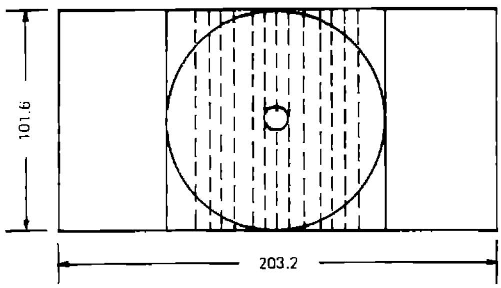


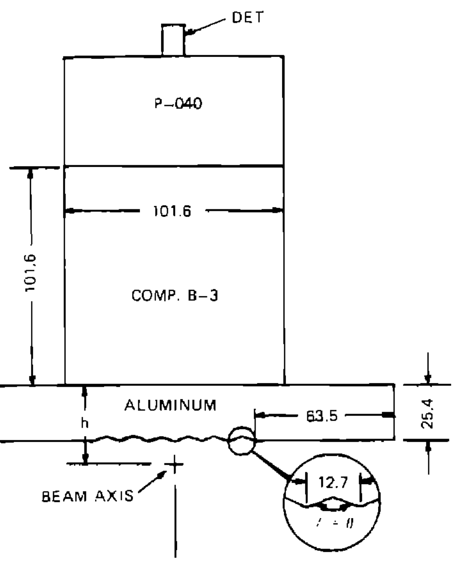


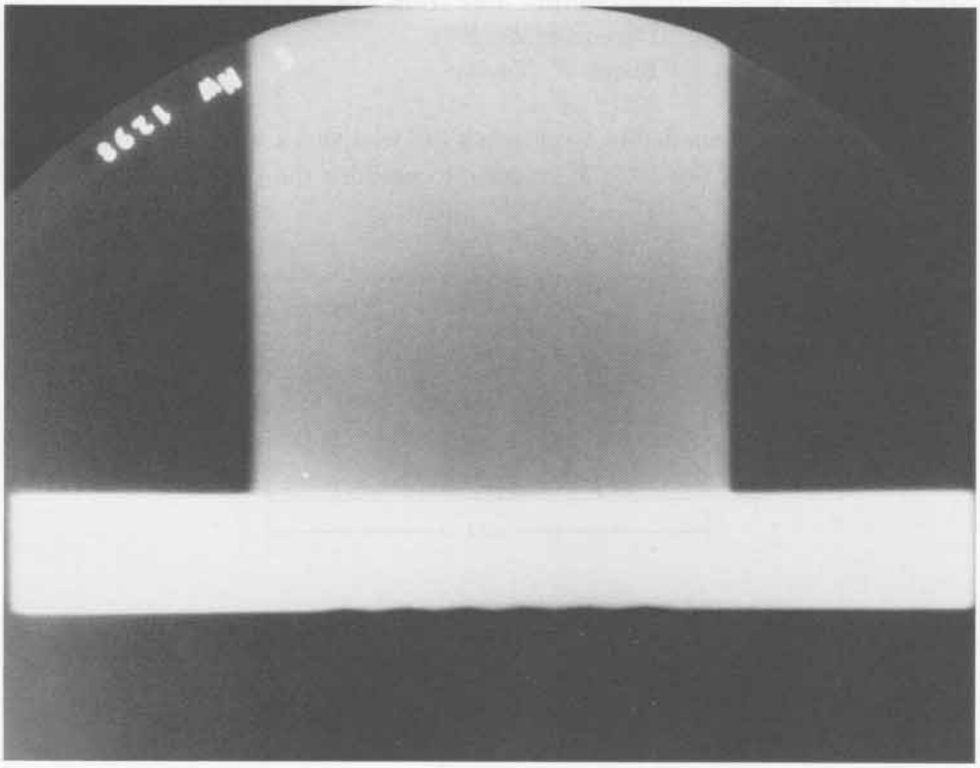


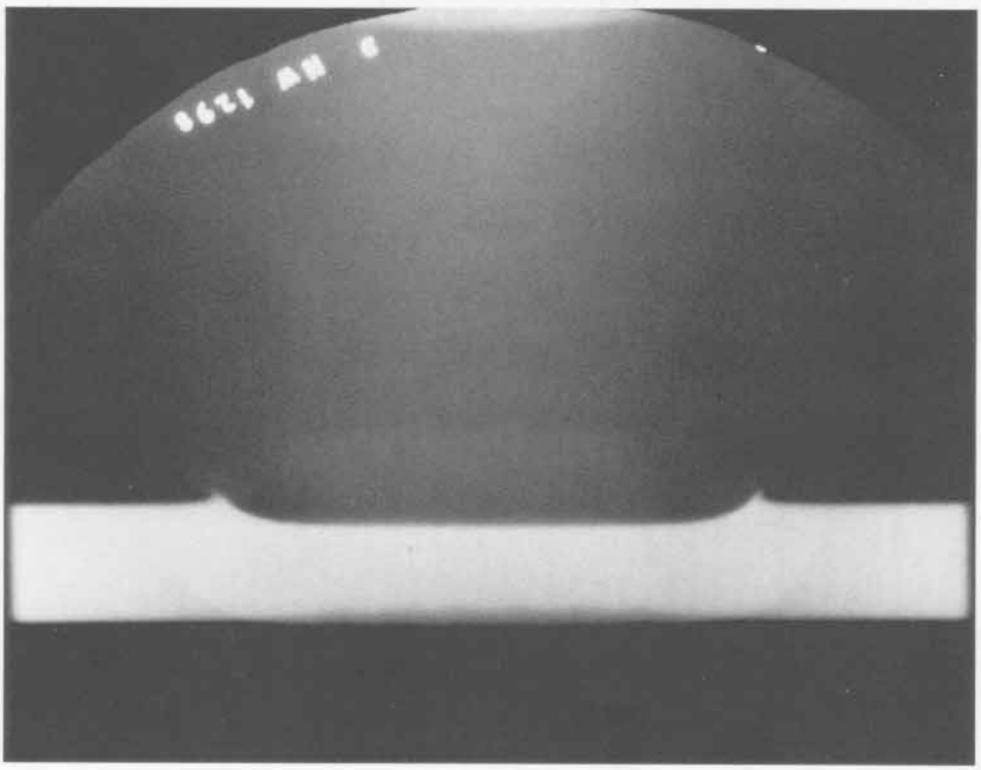
SHOT 1298: **Aluminum Jets from 160° Grooves**
Date: January 27, 1971
Experimenter: Roger W. Taylor
Radiographic Time: 30.39 μs

Metallic jets were formed. The explosively induced shock wave in the aluminum plate interacted with the 160°, θ, grooves, to produce the jets. h was 30.1 mm.



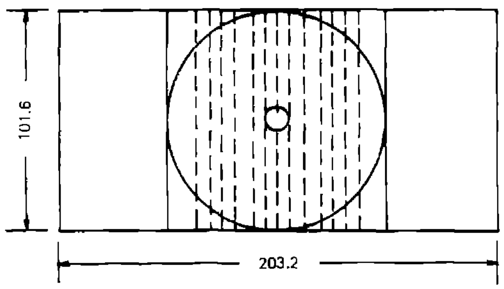


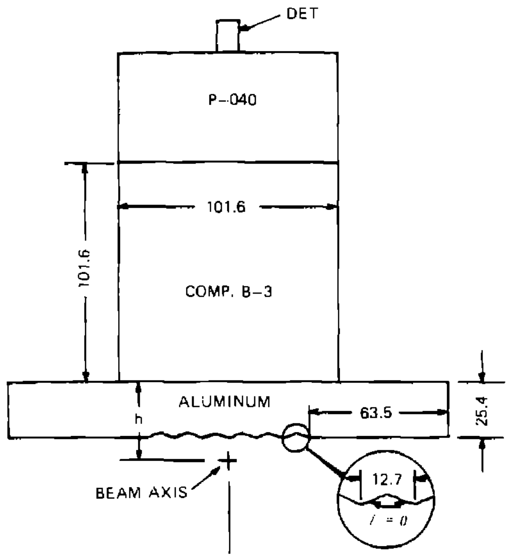


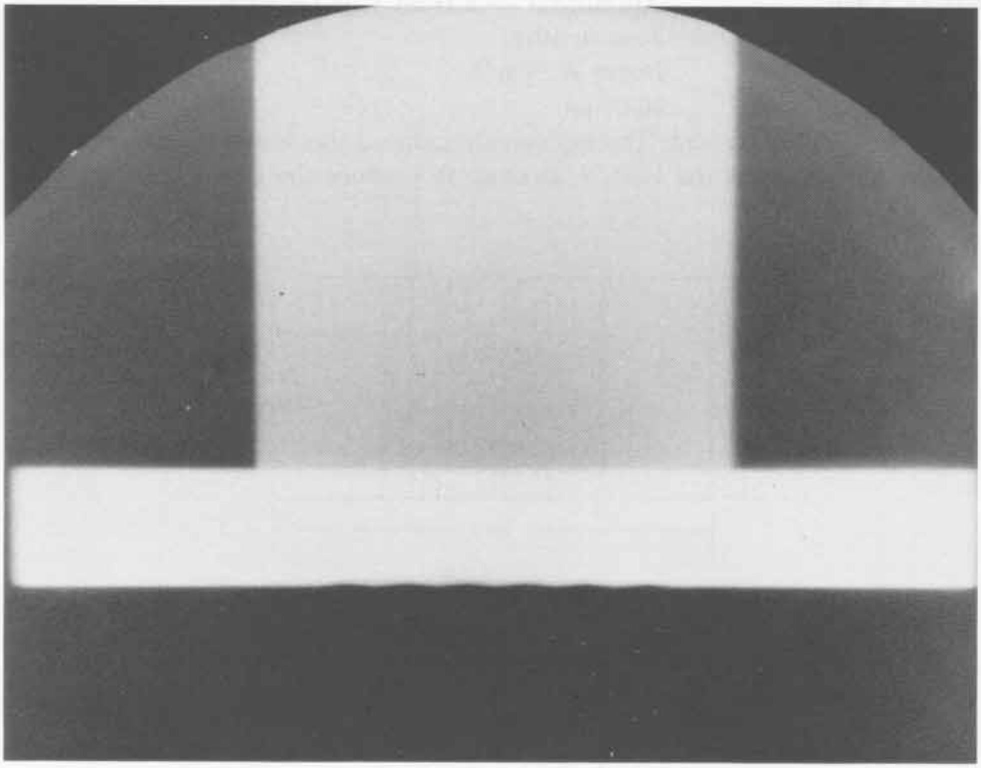


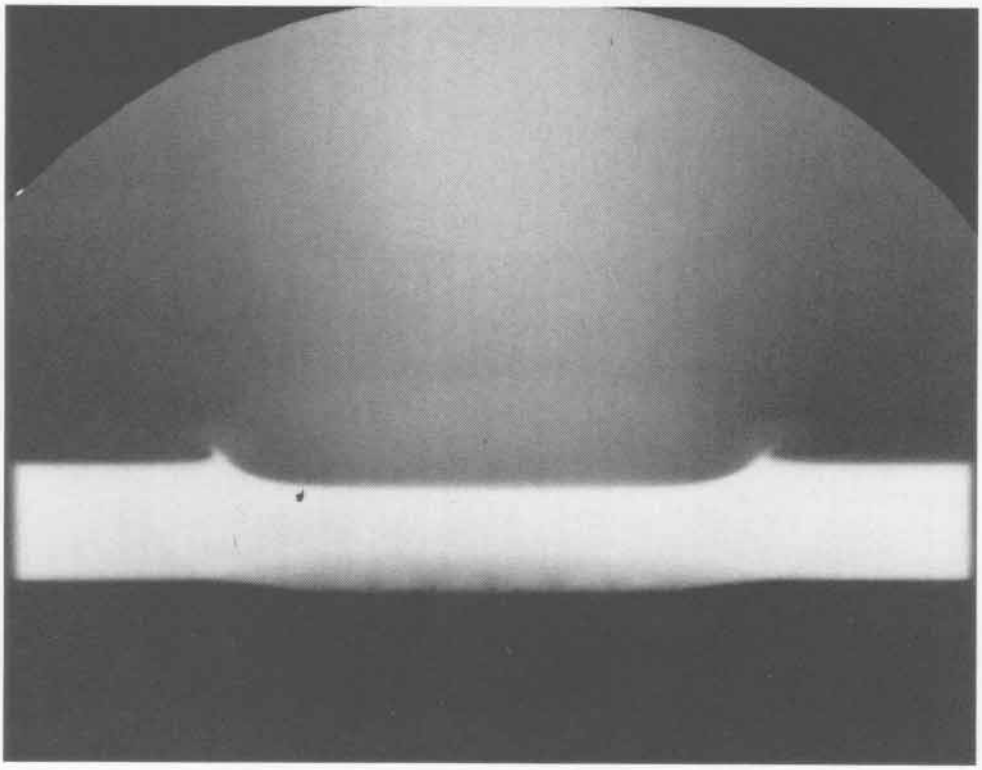
SHOT 1299: **Aluminum Jets from 170° Grooves**
Date: December 23, 1971
Experimenter: Roger W. Taylor
Radiographic Time: 30.72 μs

Metallic jets were formed. The explosively induced shock wave in the aluminum plate interacted with the 170°, θ, grooves, to produce the jets. h was 32.6 mm.



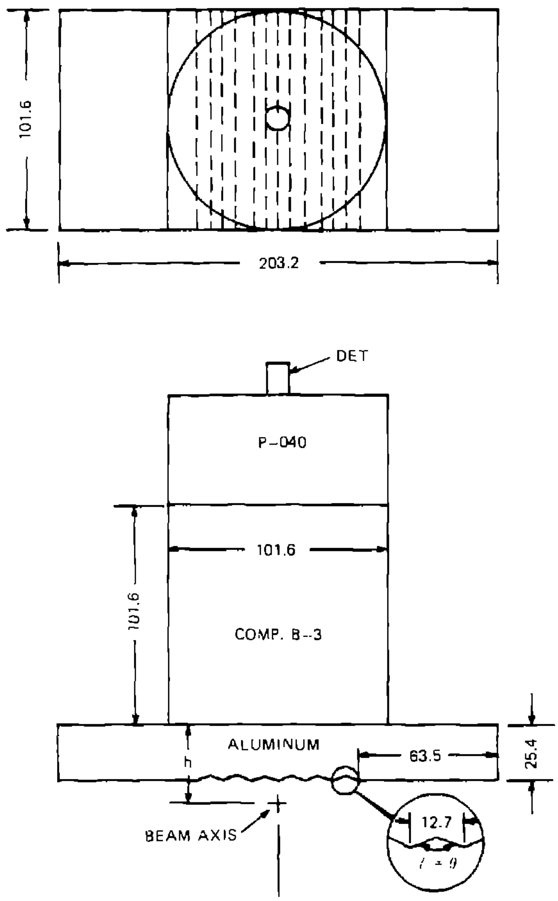


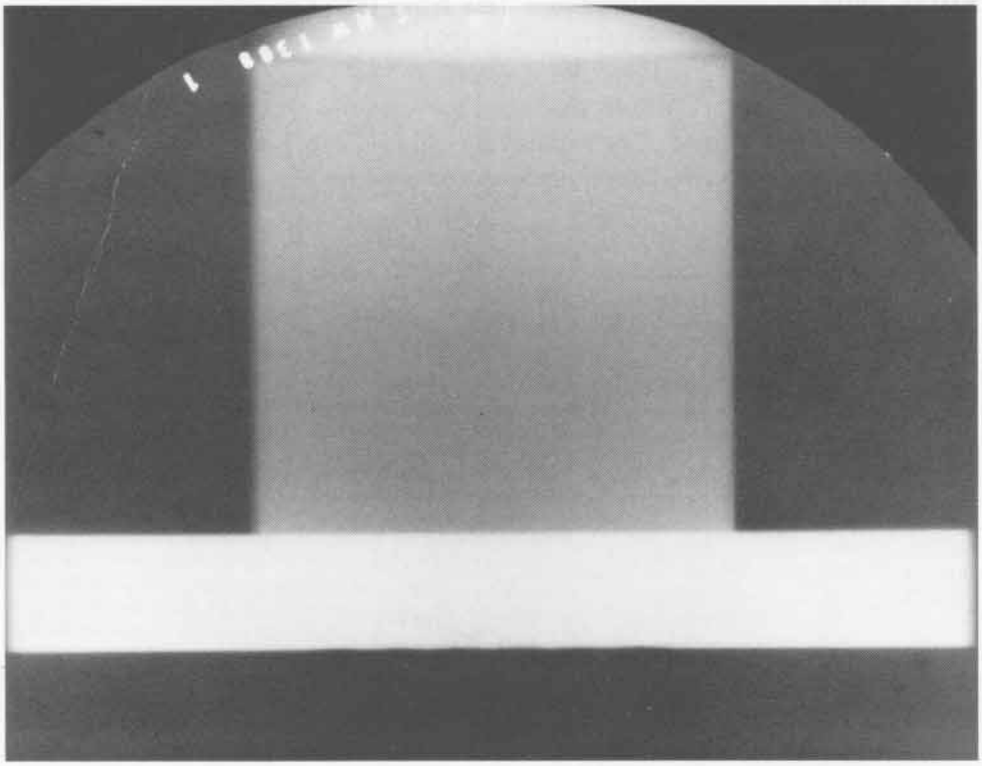


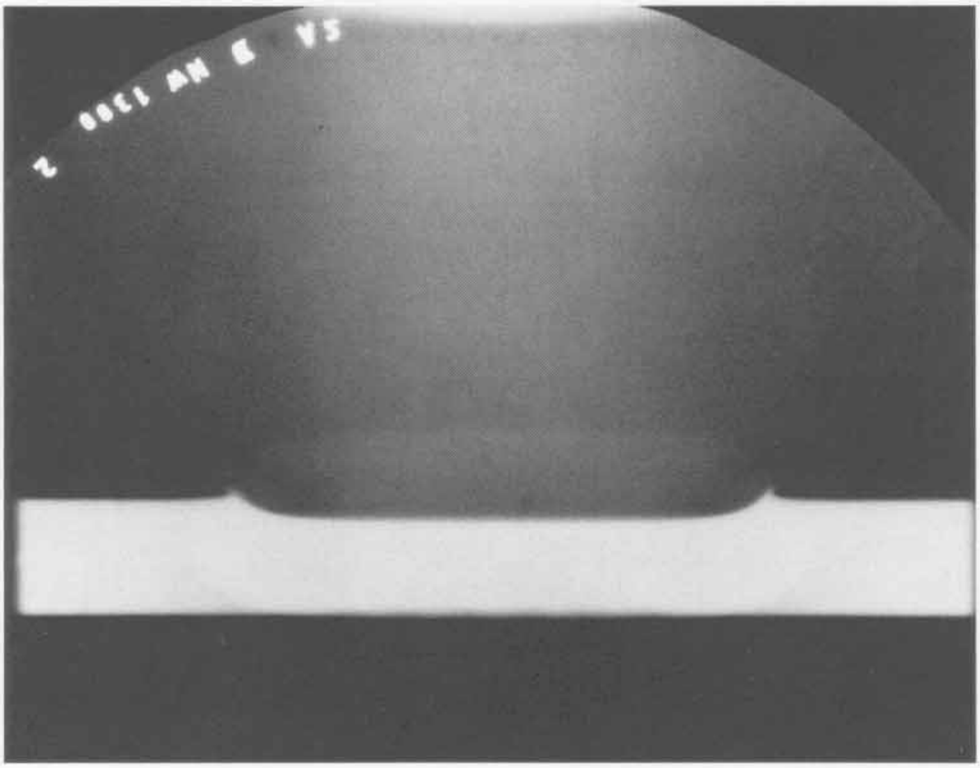


SHOT 1300: **Aluminum Jets from 175° Grooves**
Date: June 9, 1971
Experimenter: Roger W. Taylor
Radiographic Time: 30.07 μs

Metallic jets were formed. The explosively induced shock wave in the aluminum plate interacted with the 175°, θ, grooves, to produce the jets. h was 27.6 mm.

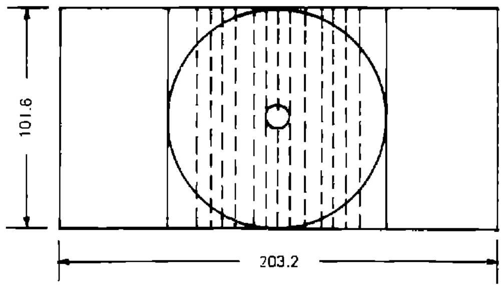


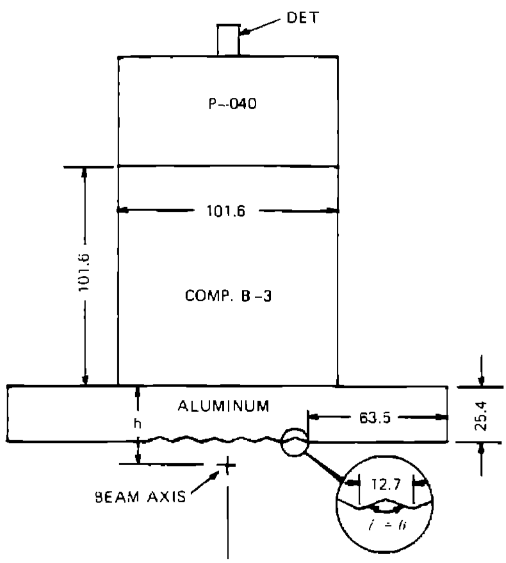


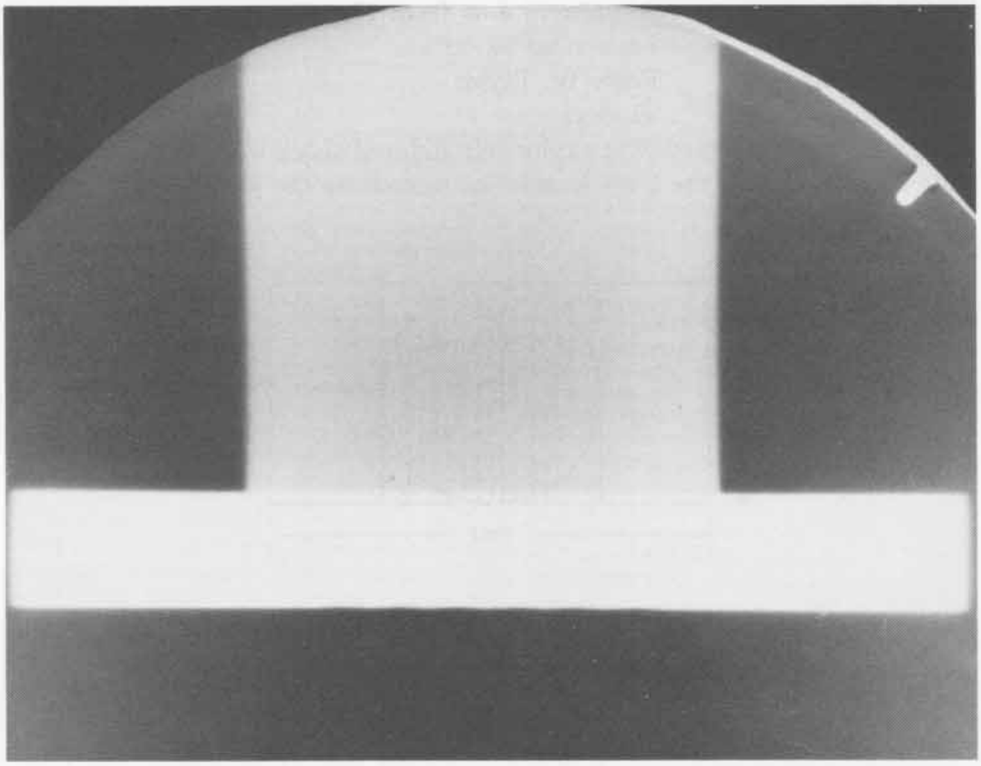


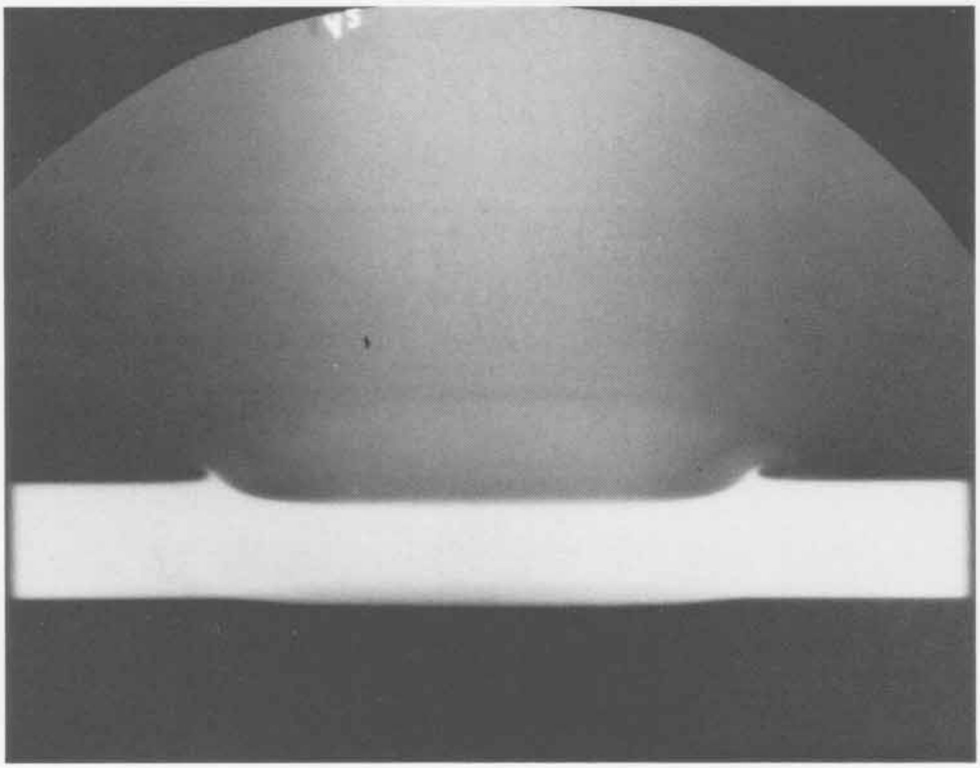
SHOT 1301: **Aluminum Jets from 175° Grooves**
Date: September 29, 1971
Experimenter: Roger W. Taylor
Radiographic Time: 30.45 μs

Metallic jets were formed. The explosively induced shock wave in the aluminum plate interacted with the 175°, θ, grooves, to produce the jets. h was 30.1 mm.



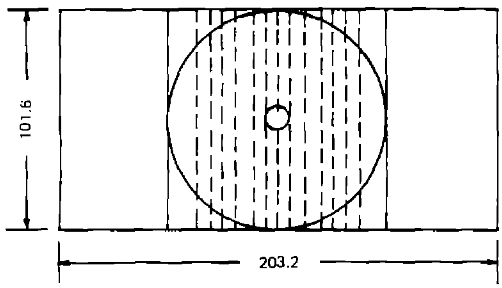


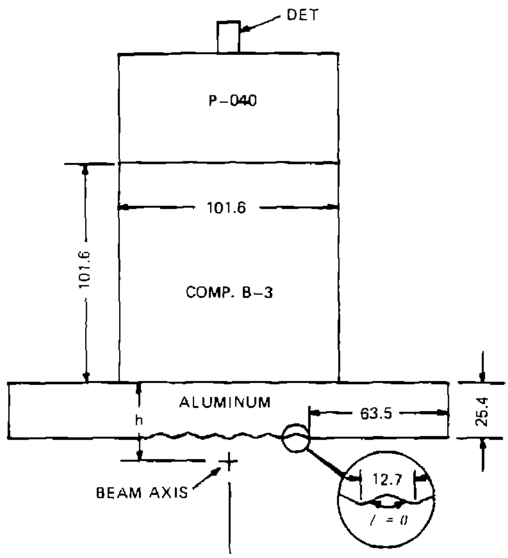


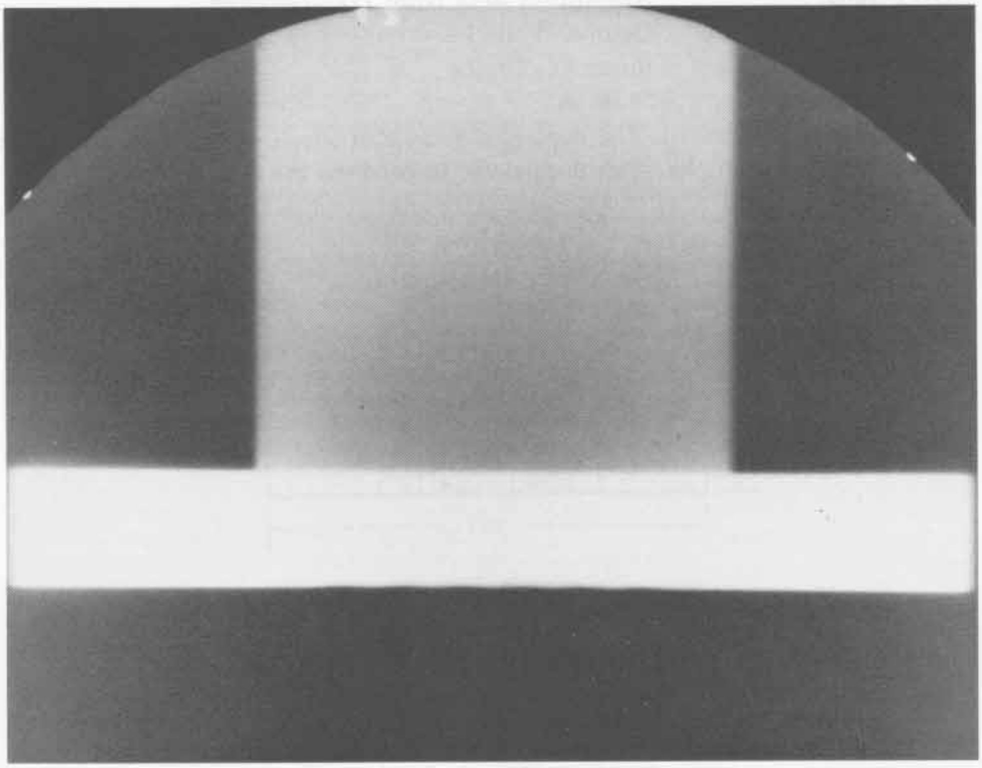


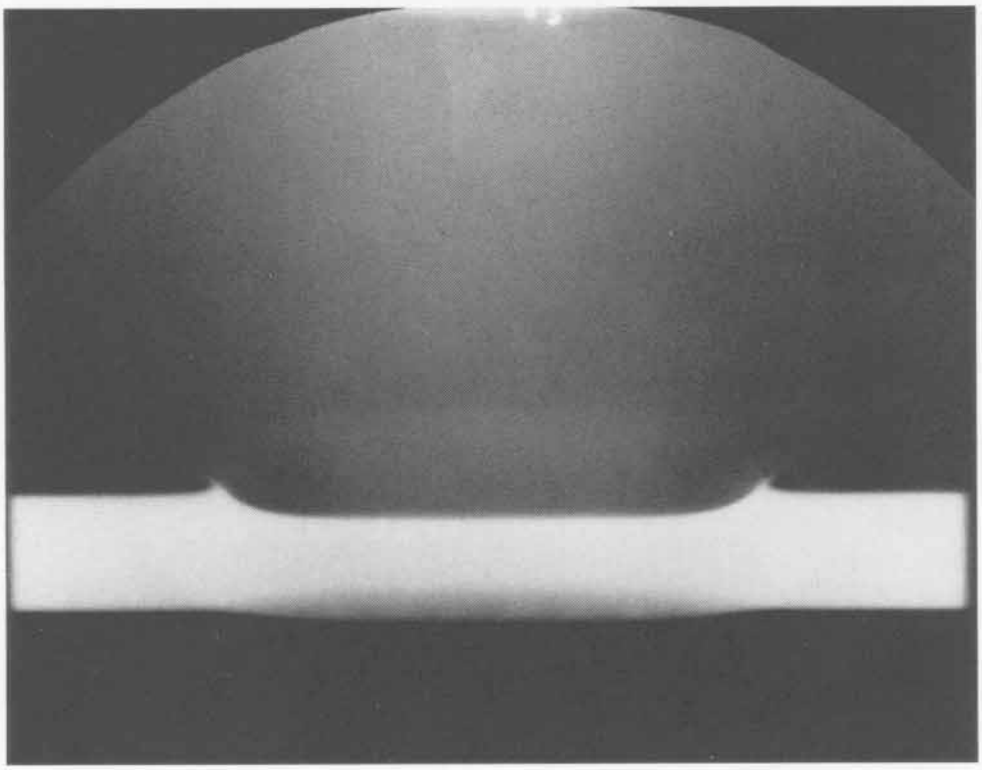
SHOT 1302: **Aluminum Jets from 175° Grooves**
Date: September 30, 1971
Experimenter: Roger W. Taylor
Radiographic Time: 30.79 μs

Metallic jets were formed. The explosively induced shock wave in the aluminum plate interacted with the 175°, θ, grooves, to produce the jets. h was 32.6 mm.



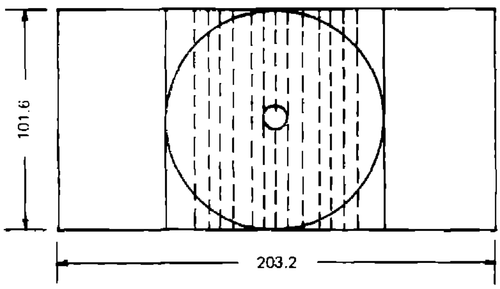


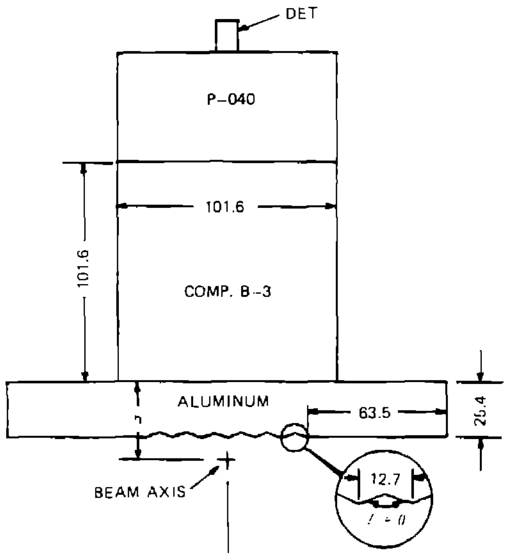


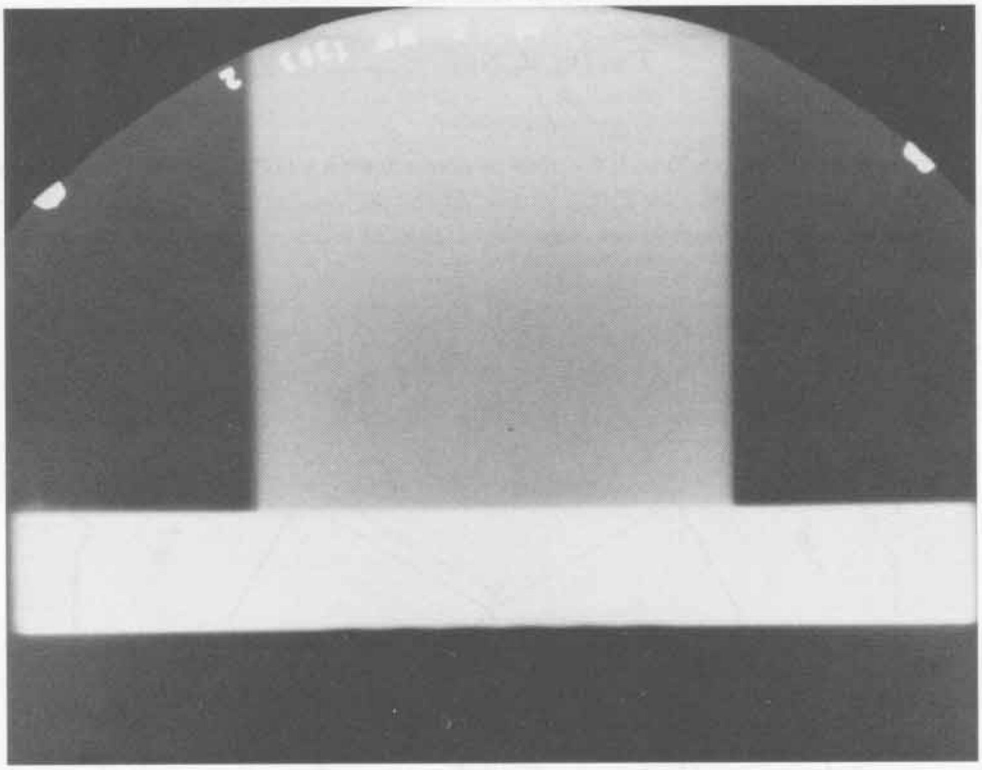


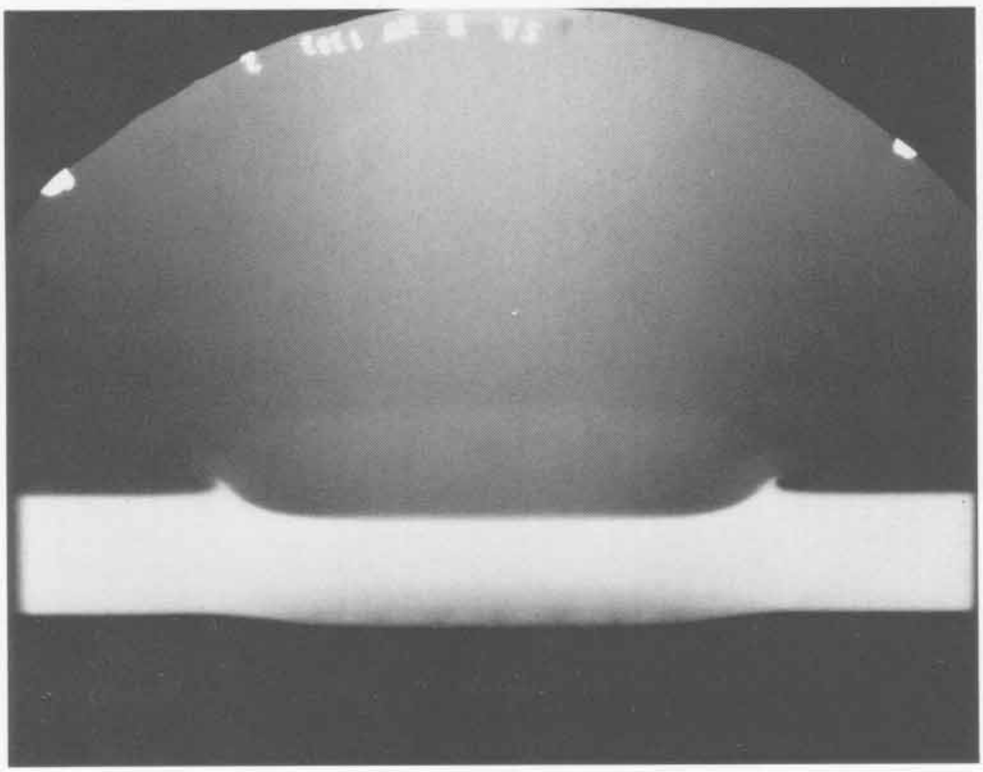
SHOT 1303: **Aluminum Jets from 175° Grooves**
Date: October 5, 1971
Experimenter: Roger W. Taylor
Radiographic Time: 31.08 μs

Metallic jets were formed. The explosively induced shock wave in the aluminum plate interacted with the 175°, θ, grooves, to produce the jets. h was 35.1 mm.









SHOT 1333: **Beryllium Regular Shock Reflection**

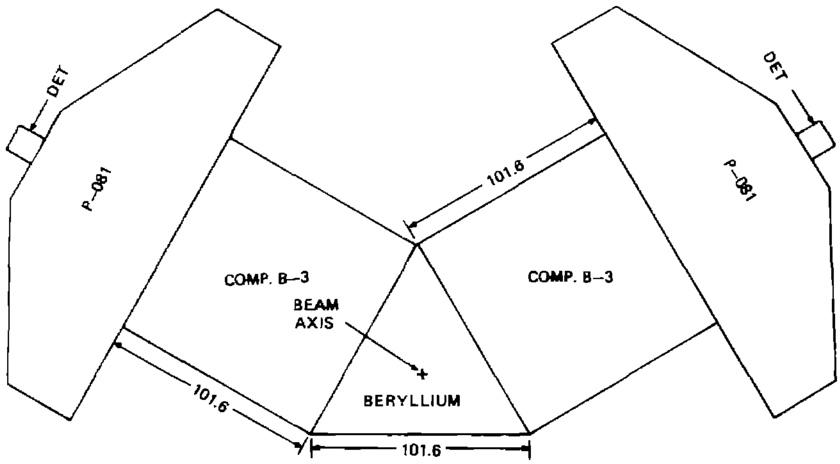
Date: March 12, 1975

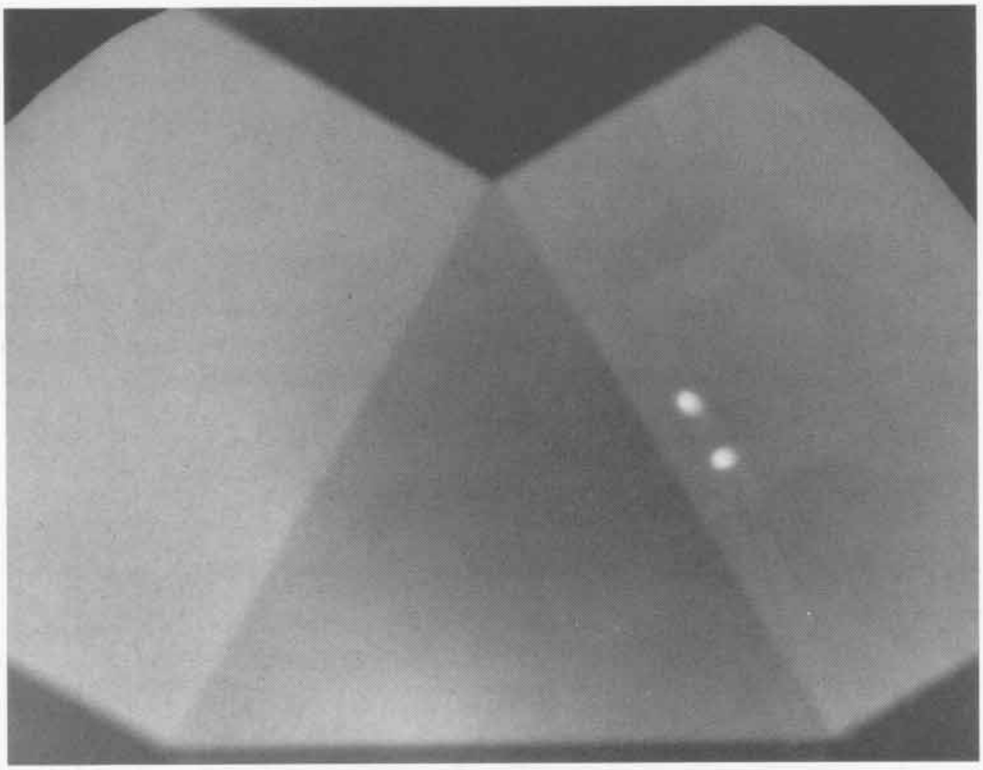
Experimenter: Timothy R. Neal

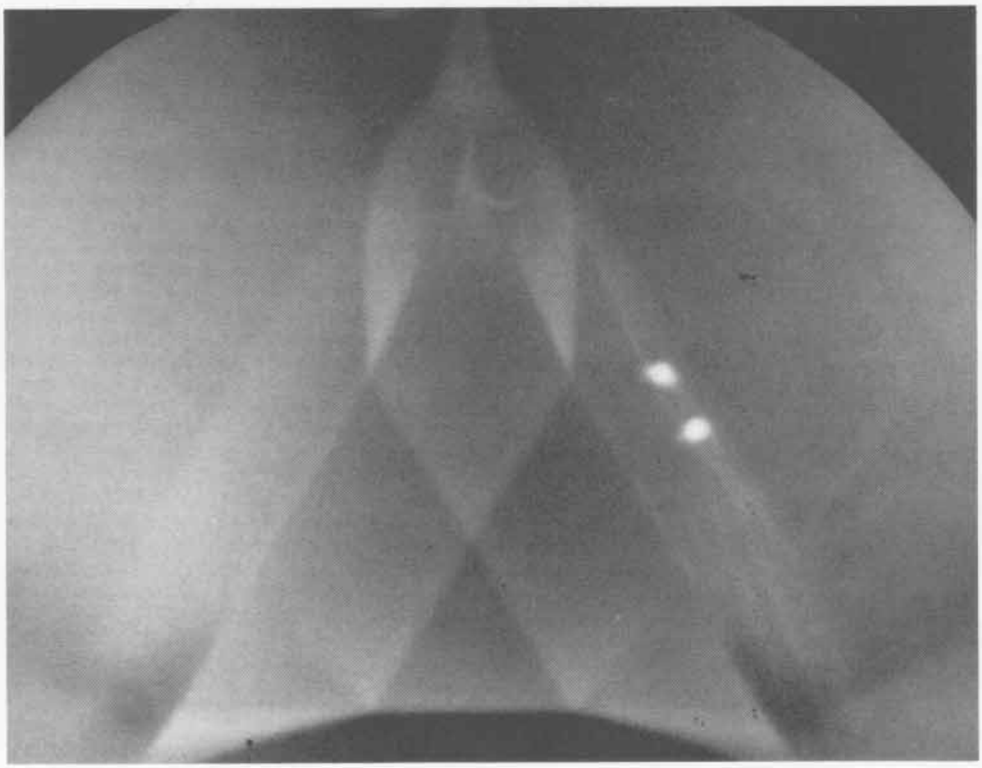
Radiographic Time: 38.43 μs

Reference: Neal, 1979

Two 101.6-mm Composition B-3 cubes in contact with a 60° beryllium wedge were initiated simultaneously by P-081 lenses. At the 30° collision angle, regular reflection of the two beryllium shock waves occurred. The beam axis is centered on the sample.

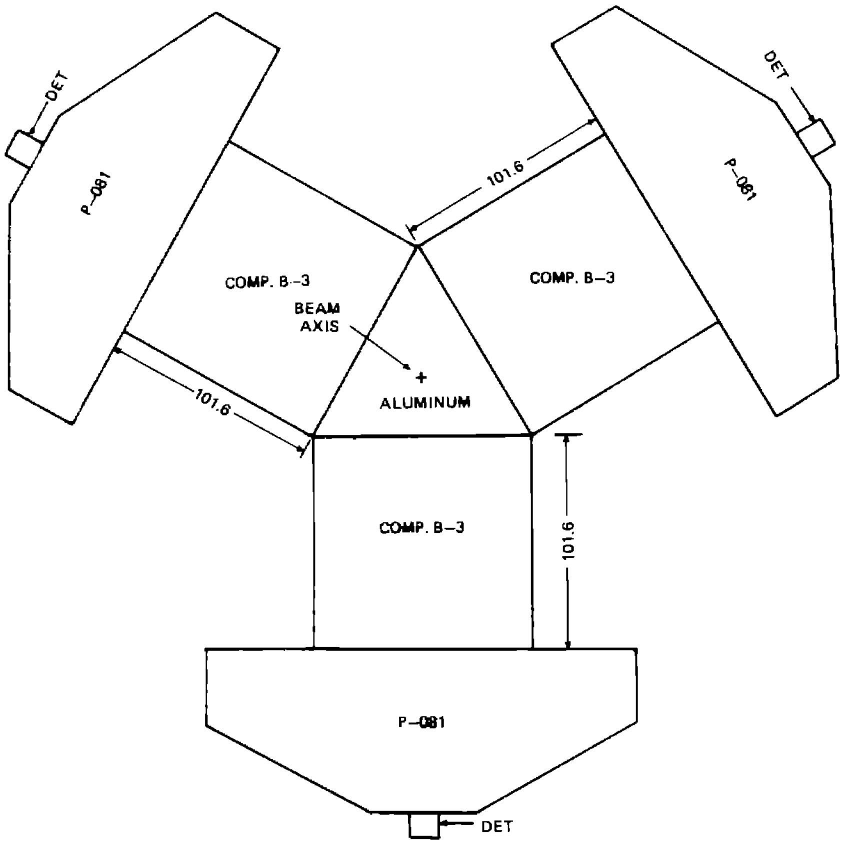


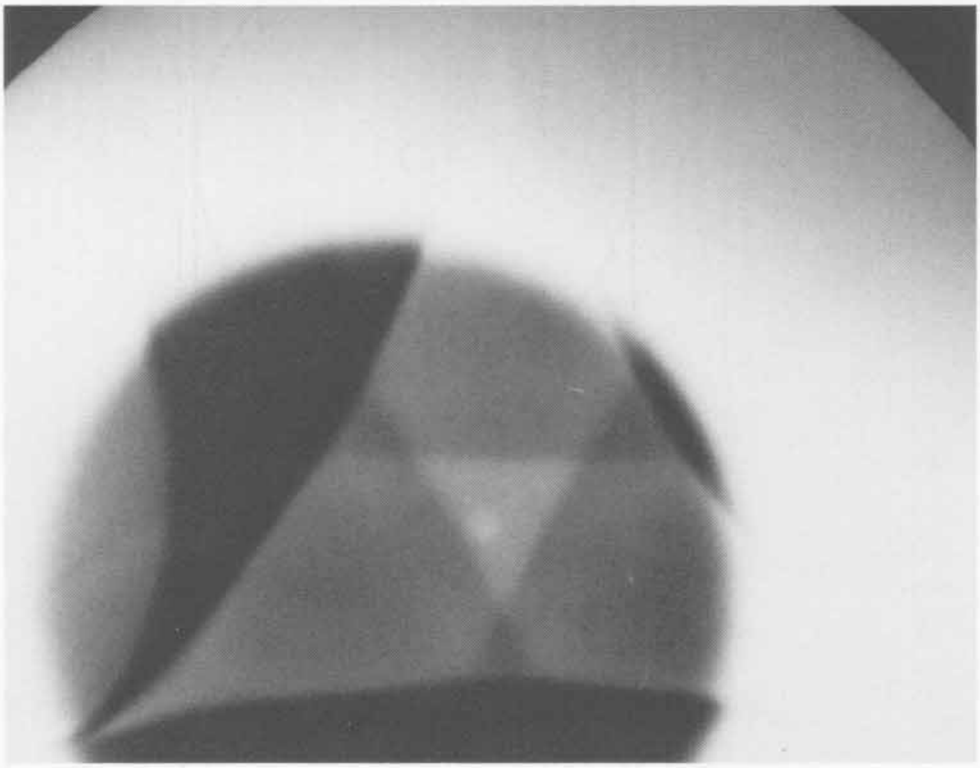




SHOT 1338:	**Aluminum Triple-Shock Reflection**
Date:	December 20, 1974
Experimenter:	Timothy R. Neal
Radiographic Time:	40.08 μs
Reference:	Neal, 1976a

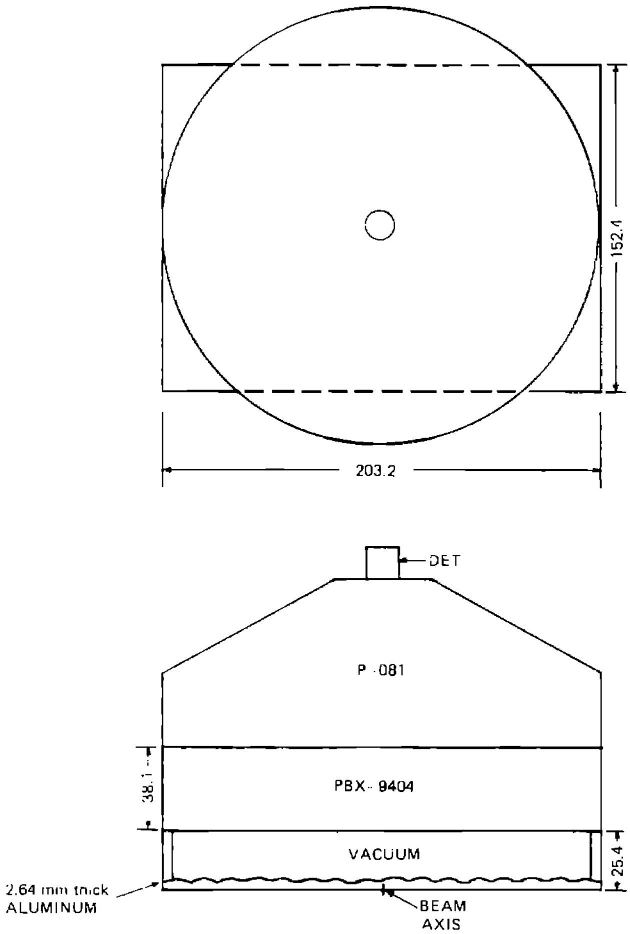
Three 101.6-mm Composition B-3 cubes in contact with a 60° 6061 aluminum wedge were initiated simultaneously by P-081 lenses. A triple-interaction shock wave occurred when the three regular reflection shocks collided.

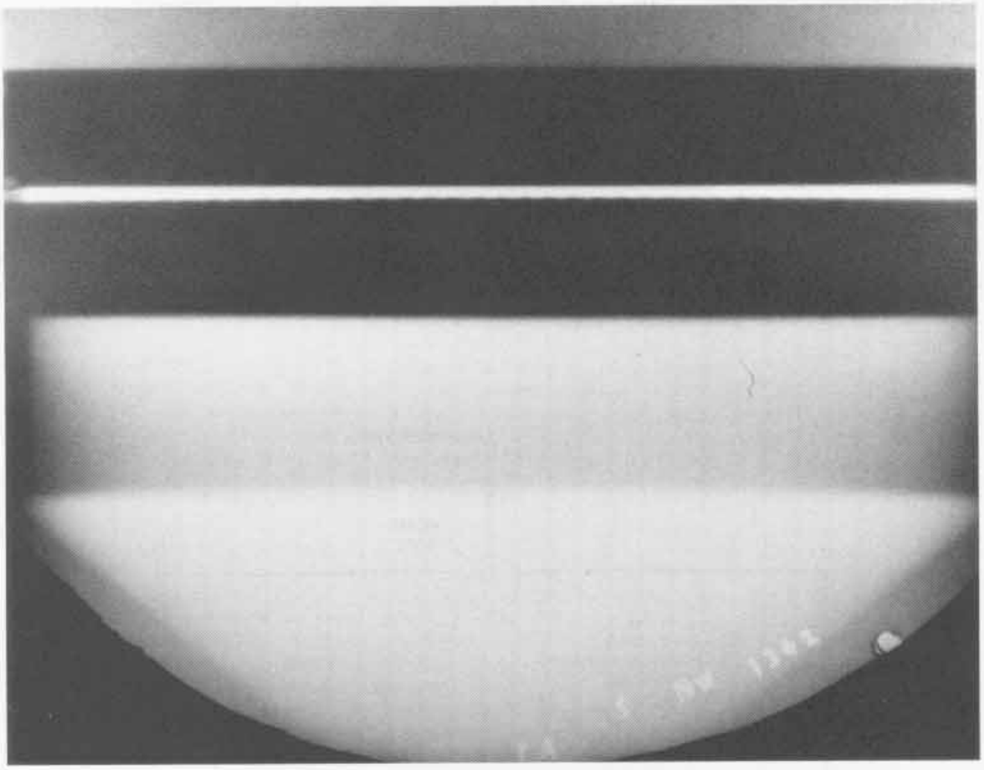


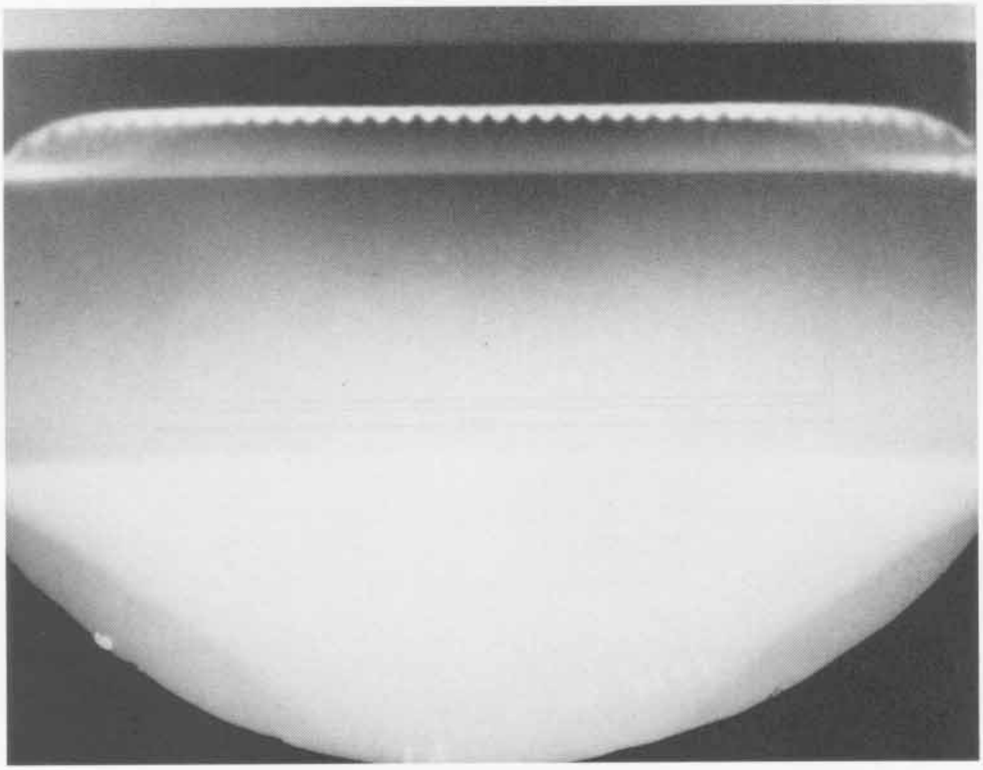


SHOT 1342:	**Taylor Instability in Aluminum**
Date:	March 9, 1971
Experimenter:	Roger W. Taylor
Radiographic Time:	34.99 μs
Reference:	Barnes et al., 1974

A 2.64-mm-thick plate of 1100 aluminum with uniform sinusoidal surface grooves 0.203 mm deep and a wavelength of 5.08 mm was driven by detonation products from 38.1 mm of PBX-9404 initiated by a P-081 lens. The detonation products expanded 25.4 mm in a vacuum for 8.0 μs. The observed amplitude of the wave was 1.515 mm.

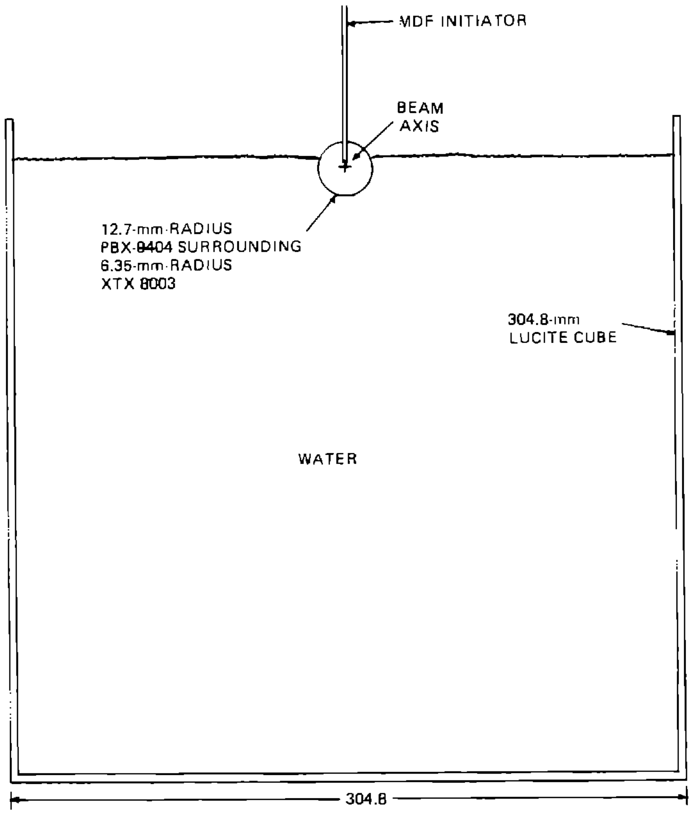


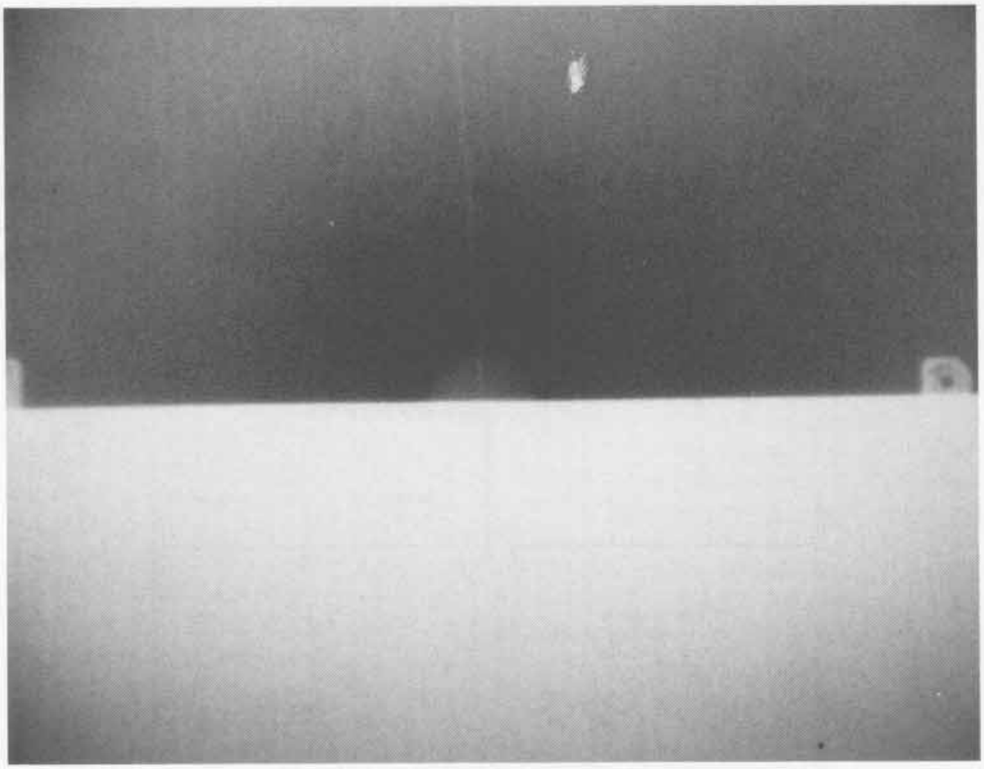


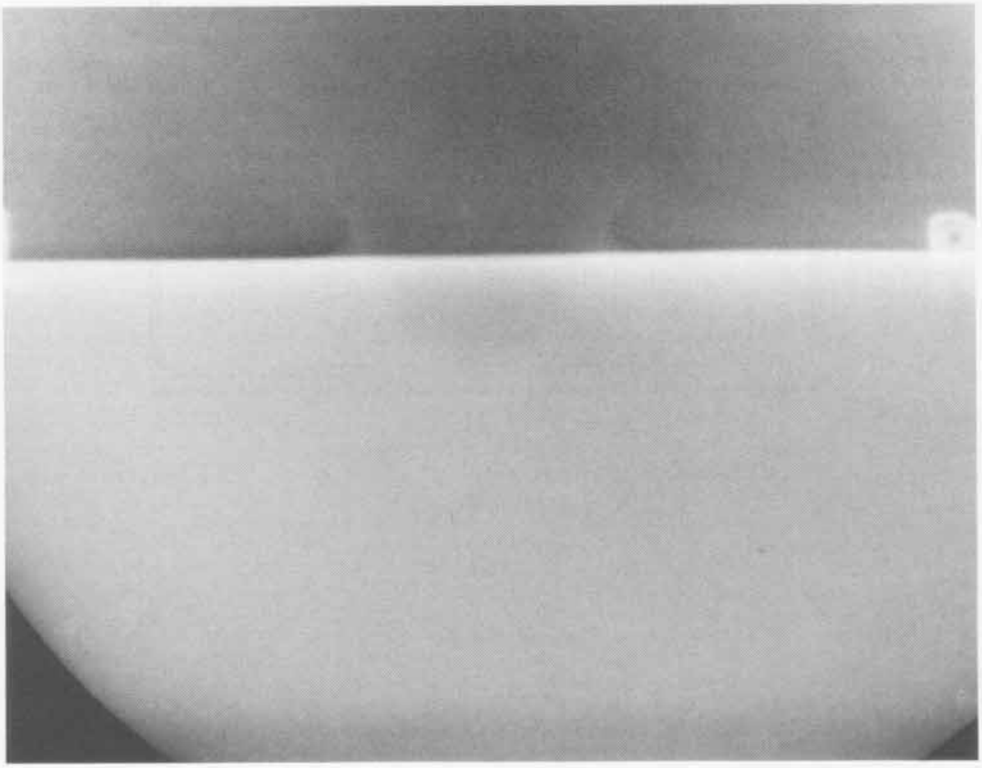


SHOT 1350: **Water Splash Wave Formed by a PBX-9404 Sphere**
Date: March 30, 1971
Experimenter: Roger K. London
Radiographic Time: 66.03 μs
References: Mader, 1972a; Mader, 1979

The interaction with water of a 12.7-mm-radius sphere of PBX-9404 initiated by 6.35-mm-radius XTX 8003 (80/20 wt% PETN/silicone binder) detonated at its center. The sphere was half immersed in the water. The radiograph was taken 15.8 μs after detonation was initiated. The detonation wave arrived at the explosive surface in 1.5 μs. See Shots 1351 and 1352.

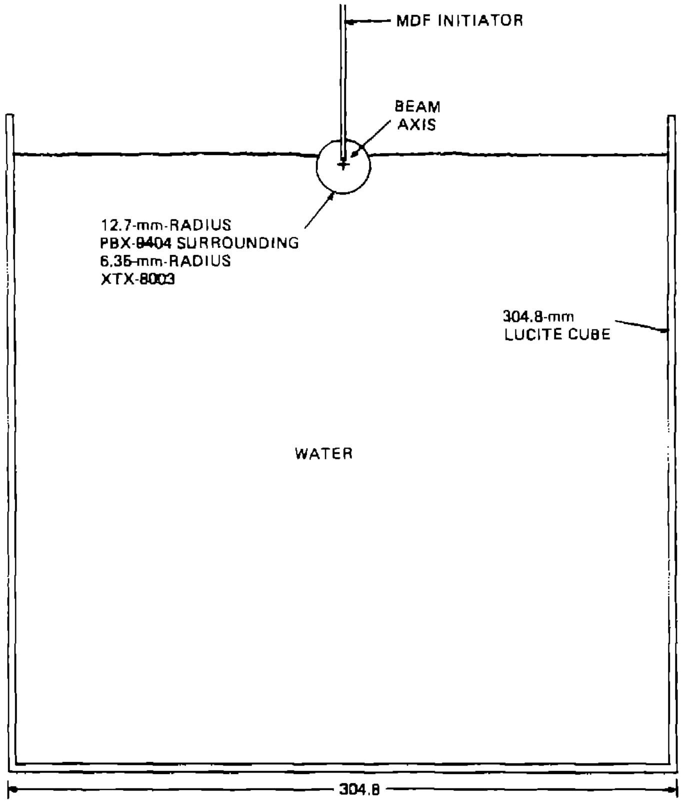


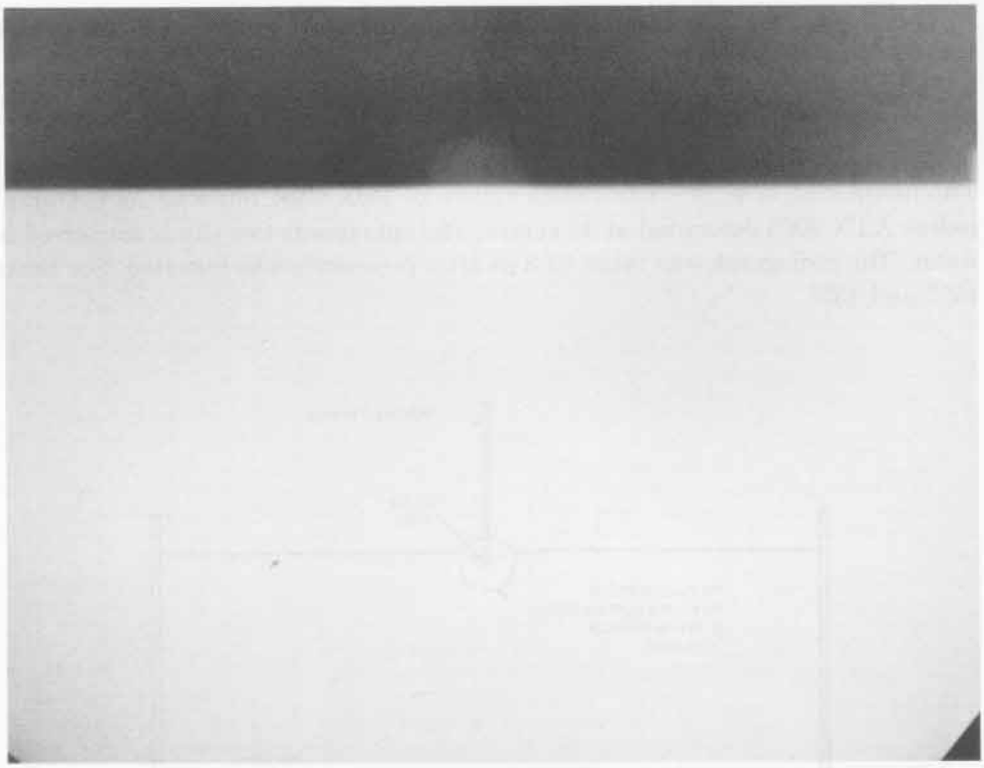


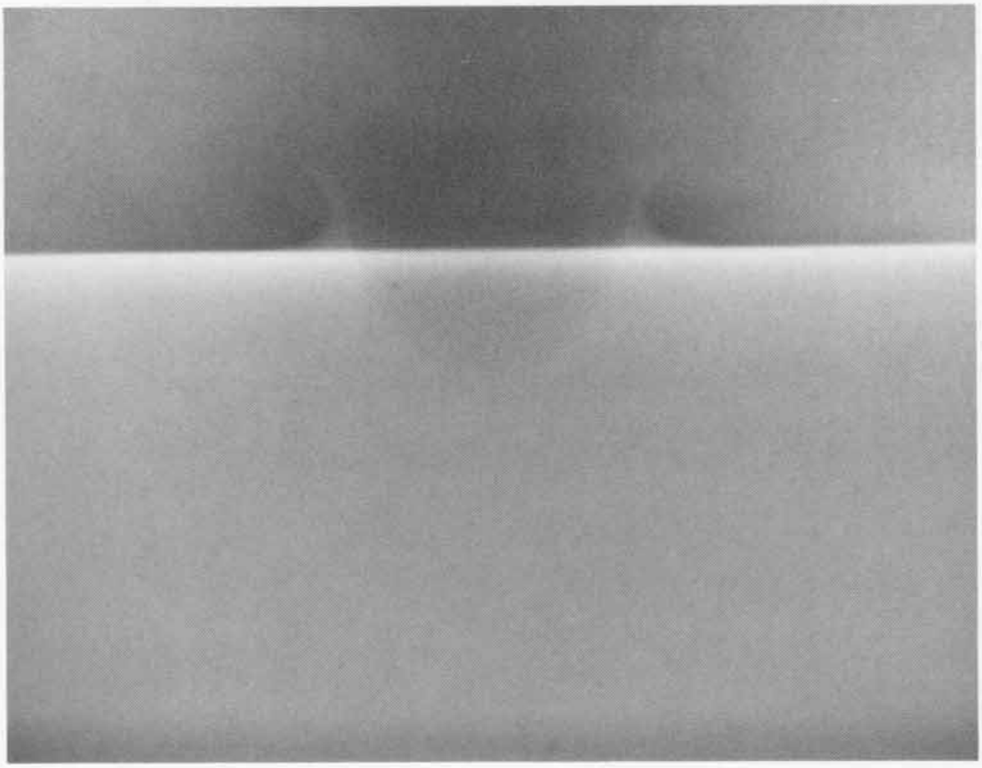


SHOT 1351: **Water Splash Wave Formed by a PBX-9404 Sphere**
Date: April 14, 1971
Experimenter: Roger K. London
Radiographic Time: 76.48 μs
References: Mader, 1972a; Mader, 1979

The interaction with water of a 12.7-mm-radius sphere of PBX-9404 initiated by 6.35-mm-radius XTX 8003 detonated at its center. The sphere was half immersed in water. The radiograph was taken 26.3 μs after detonation was initiated. See Shots 1350 and 1352.

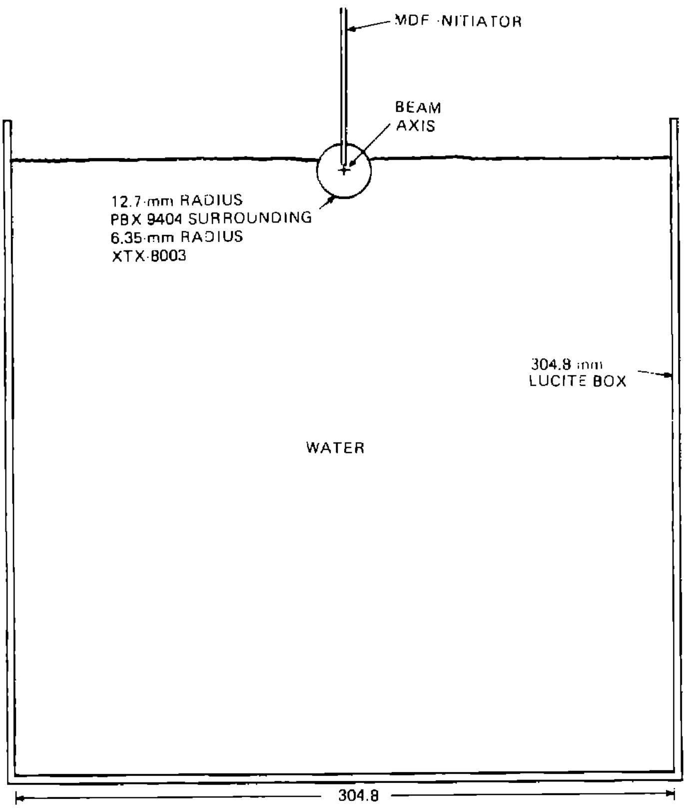


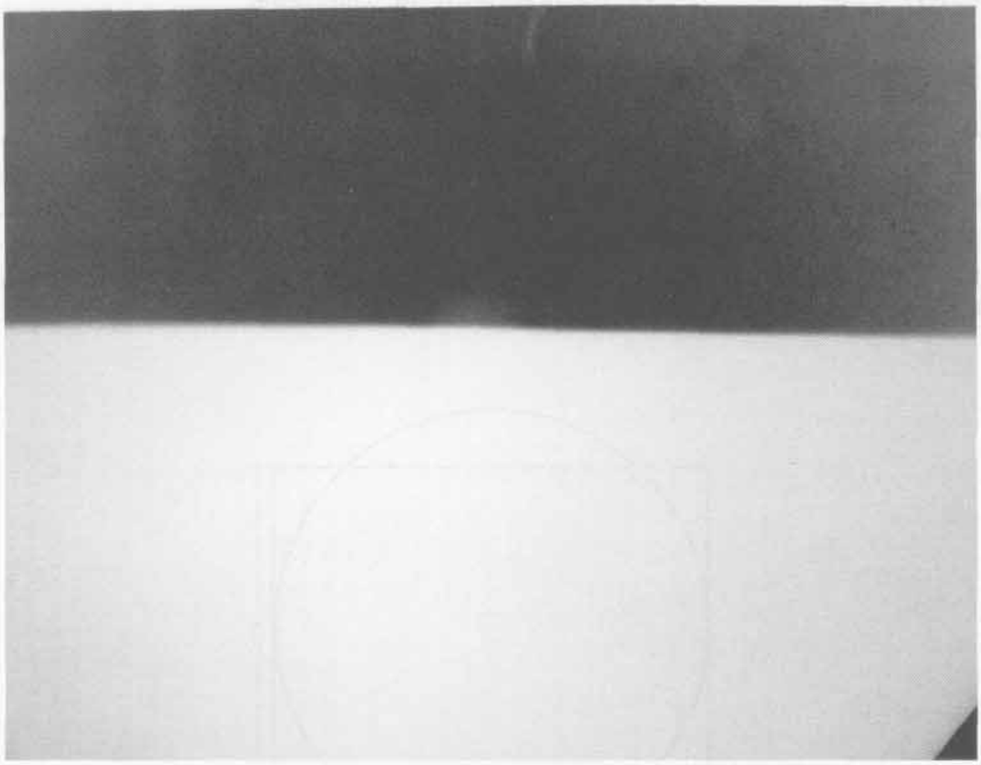


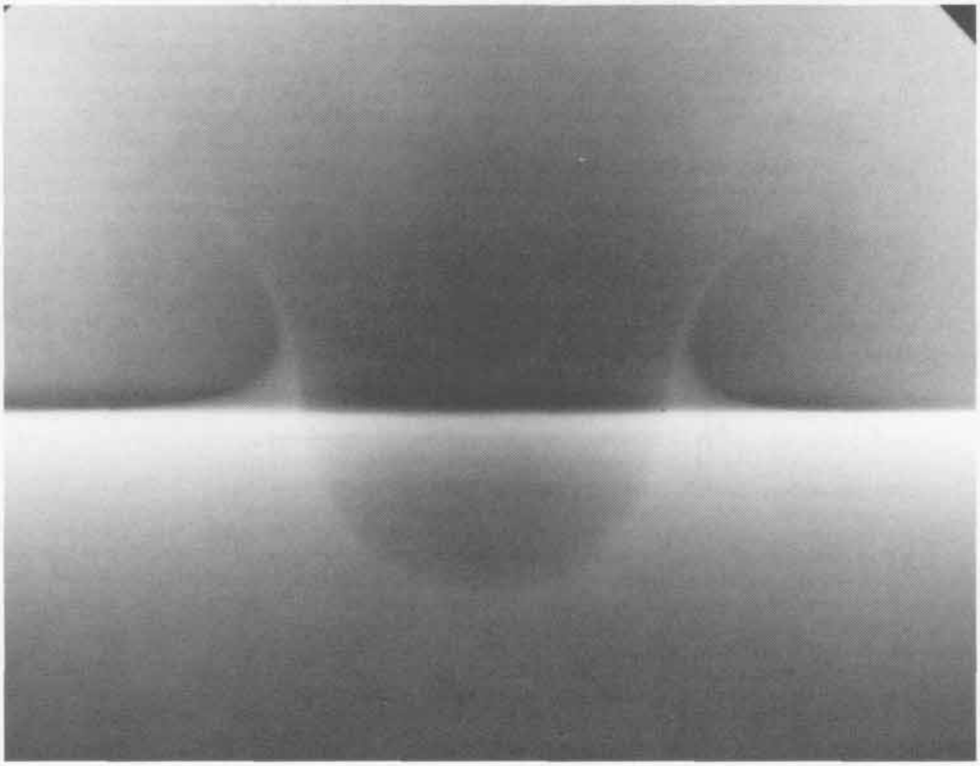


SHOT 1352: **Water Splash Wave Formed by a PBX-9404 Sphere**
Date: April 21, 1971
Experimenter: Roger K. London
Radiographic Time: 111.51 μs
Reference: Mader, 1972a

The interaction of a 12.7-mm-radius sphere of PBX-9404 initiated by 6.35-mm-radius XTX 8003 detonated at its center. The sphere was two-thirds immersed in water. The radiograph was taken 61.3 μs after detonation was initiated. See Shots 1350 and 1351.

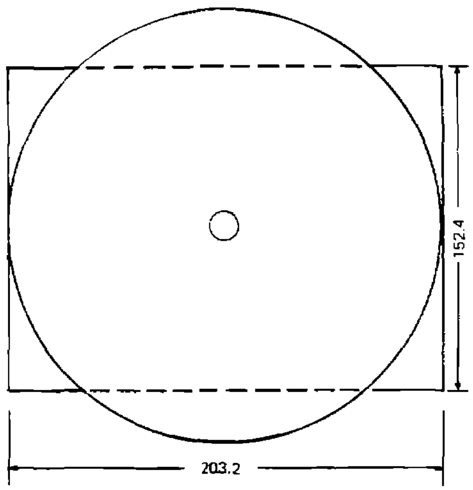


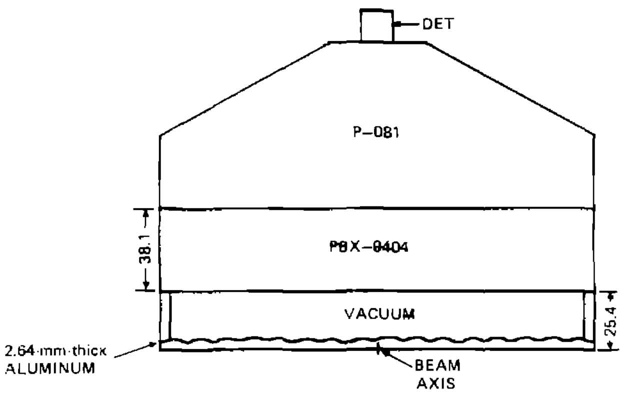


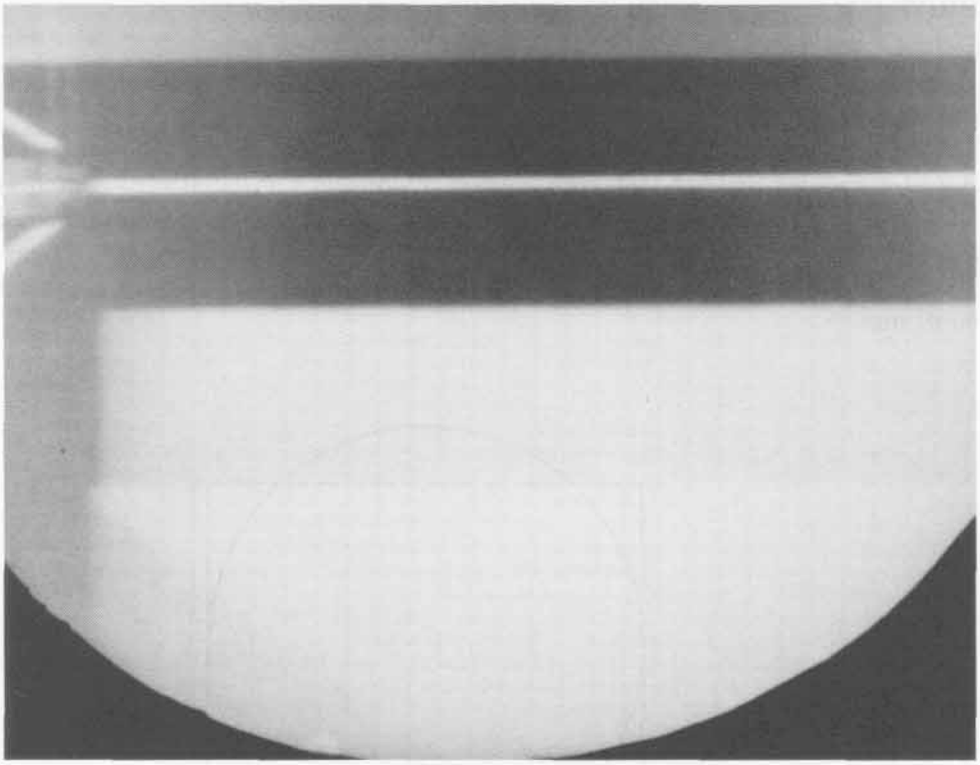


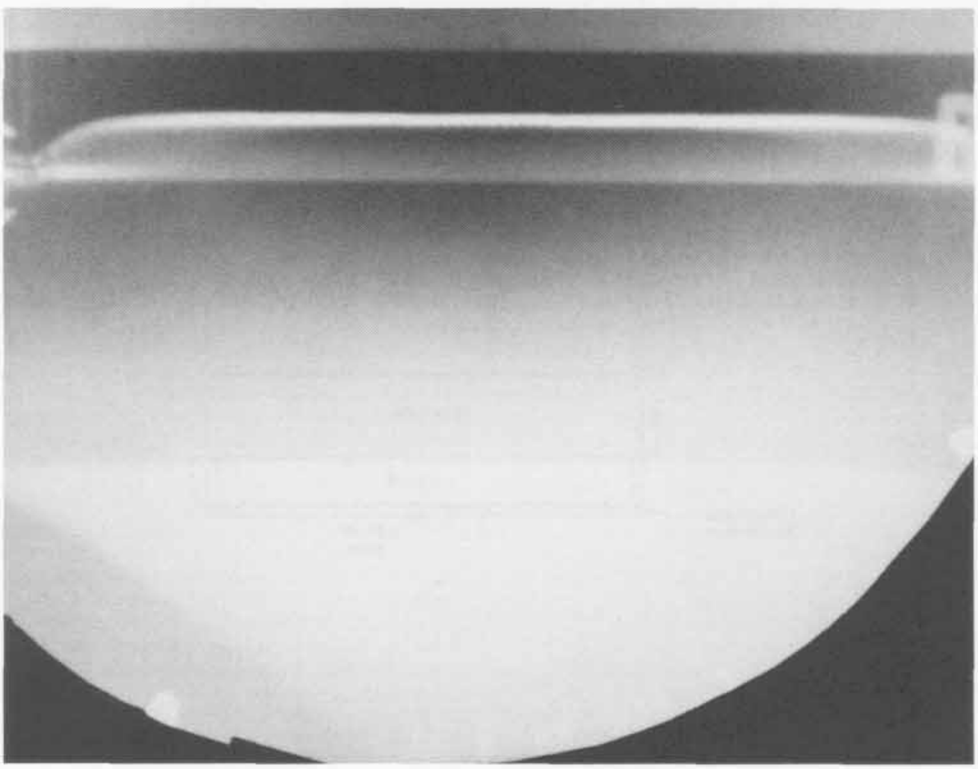
SHOT 1353:	**Taylor Instability in Aluminum**
Date:	July 2, 1971
Experimenter:	Roger W. Taylor
Radiographic Time:	35.0 μs
Reference:	Barnes et al., 1974

A 2.64-mm-thick plate of 1100 aluminum with uniform sinusoidal surface grooves 0.102 mm deep and a wavelength of 2.54 mm was driven by detonation products from 38.1 mm of PBX-9404 initiated by a P-081 lens. The detonation products expanded 25.4 mm in a vacuum for 8.0 μs. The observed amplitude of the wave was 0.165 mm. See also Shot 1824.



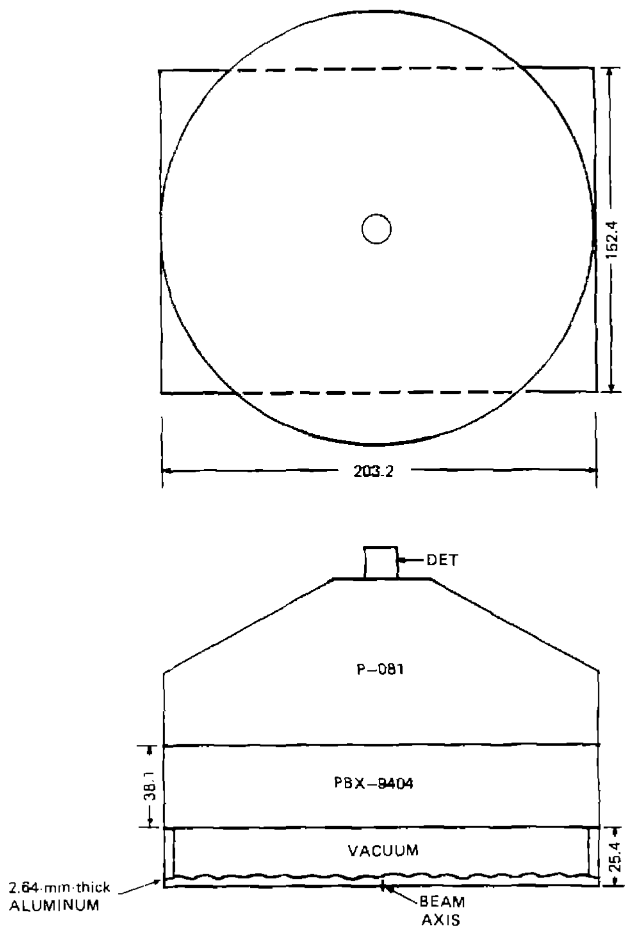


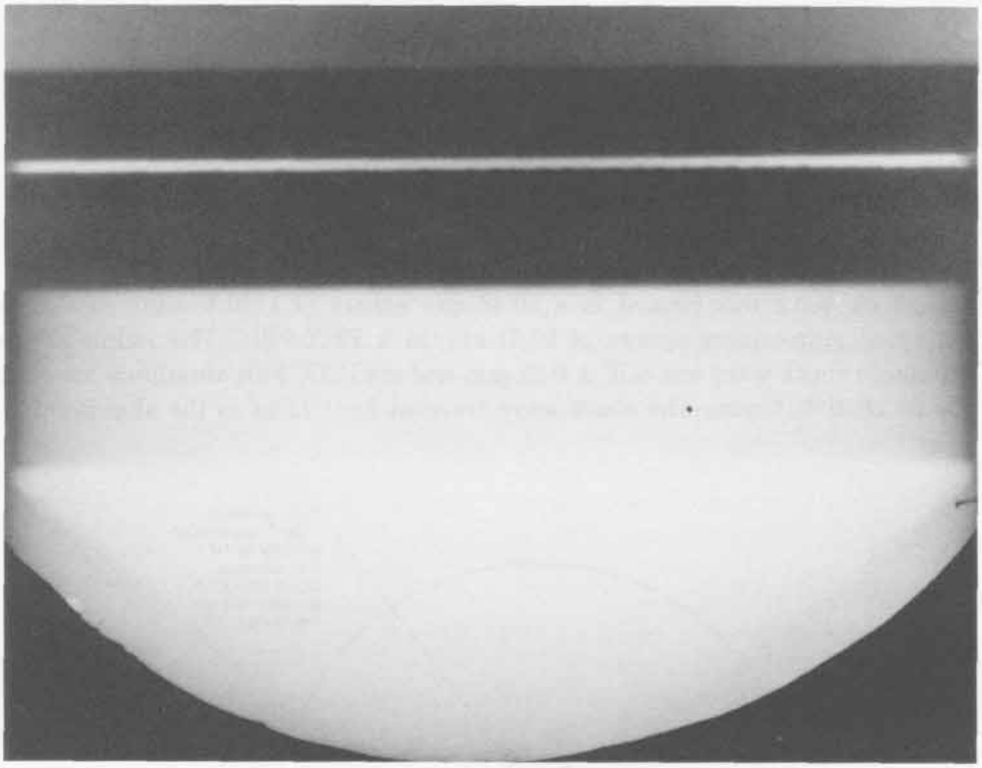


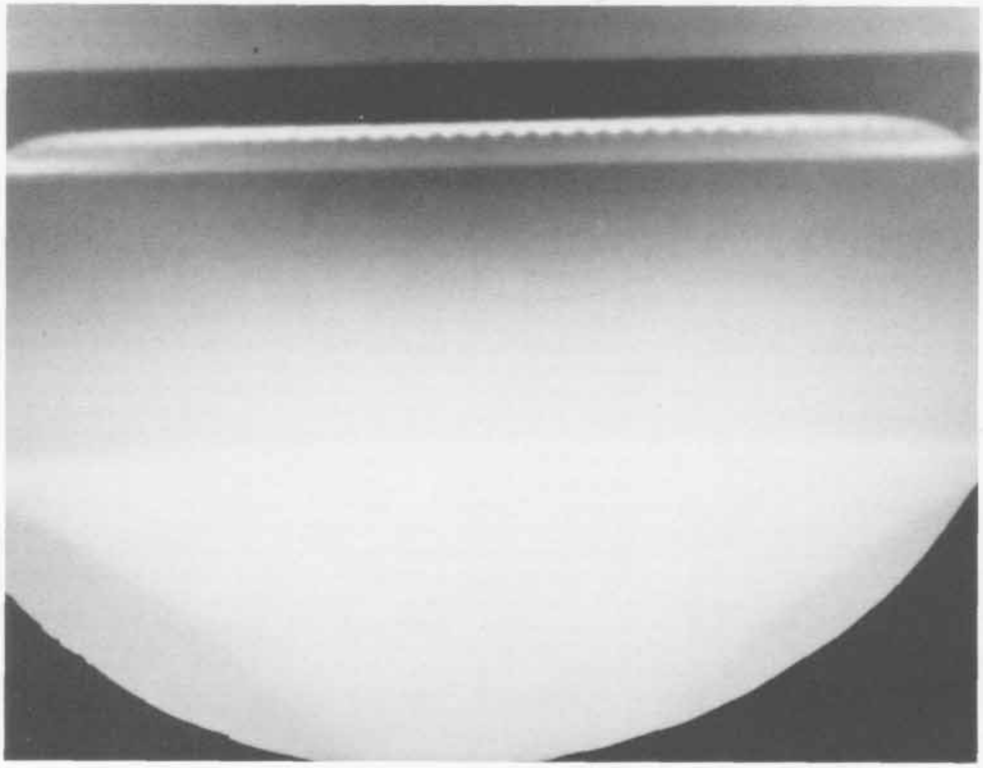


SHOT 1354: **Taylor Instability in Aluminum**
Date: March 18, 1971
Experimenter: Roger W. Taylor
Radiographic Time: 33.40 μs
Reference: Barnes et al., 1974

A 2.64-mm-thick plate of 1100 aluminum with uniform sinusoidal surface grooves 0.203 mm deep and a wavelength of 5.08 mm was driven by detonation products from 38.1 mm of PBX-9404 initiated by a P-081 lens. The detonation products expanded 25.4 mm in a vacuum for 6.4 μs. The observed amplitude of the wave was 0.880 mm.

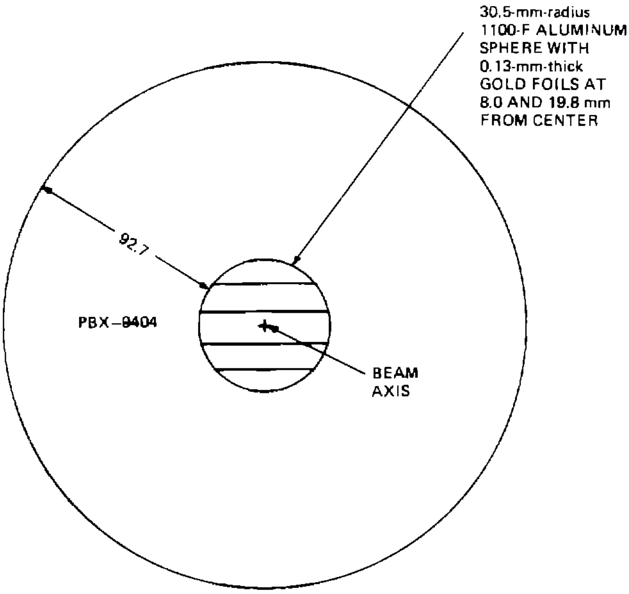


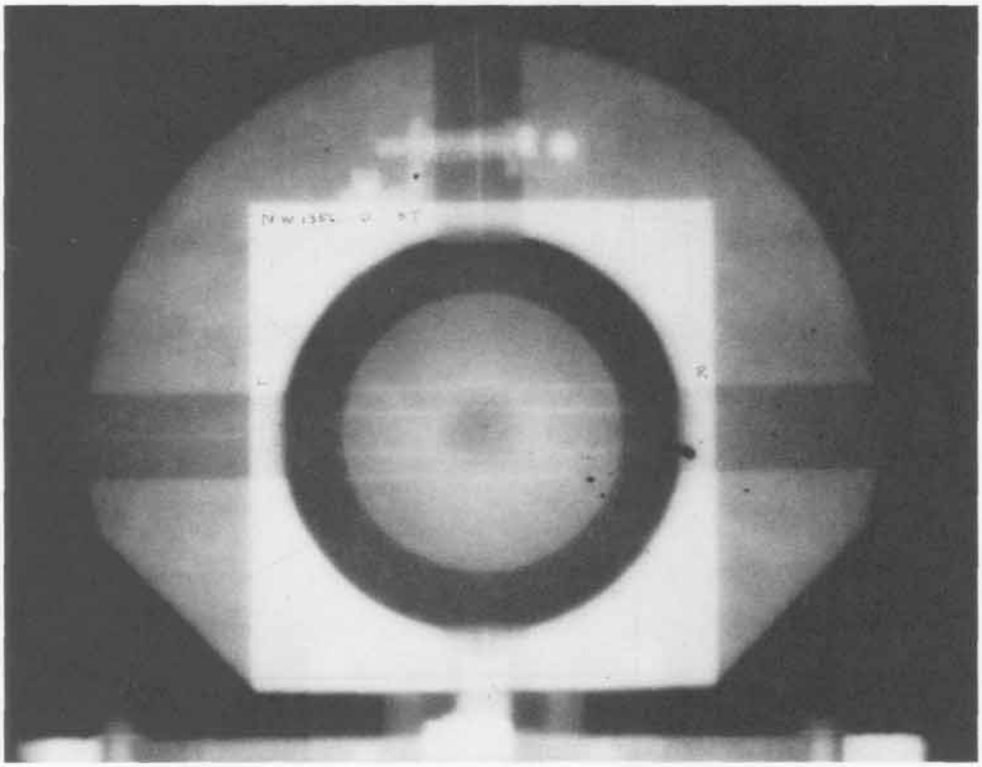




SHOT 1356: **Converging Aluminum Shock Wave**
Date: June 8, 1971
Experimenter: Reynaldo Morales
Radiographic Time: 27.59 μs
References: Mader and Craig, 1975; Mader, 1979

The shock wave was formed in a 30.48-mm sphere of 1100-F aluminum by a detonated surrounding sphere of 92.71-cm-thick PBX-9404. The radius of the aluminum shock wave was 8.78 ± 0.22 mm and the PBX-9404 aluminum interface was 26.14 ± 0.14 mm. The shock wave traveled for 1.72 μs in the aluminum.




L
R

SHOT 1365: **Taylor Instability in Aluminum**

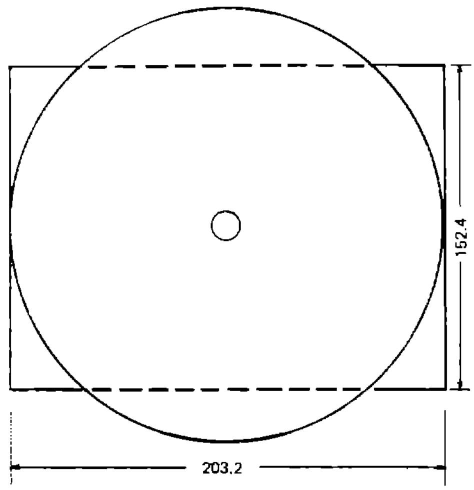
Date: April 14, 1971

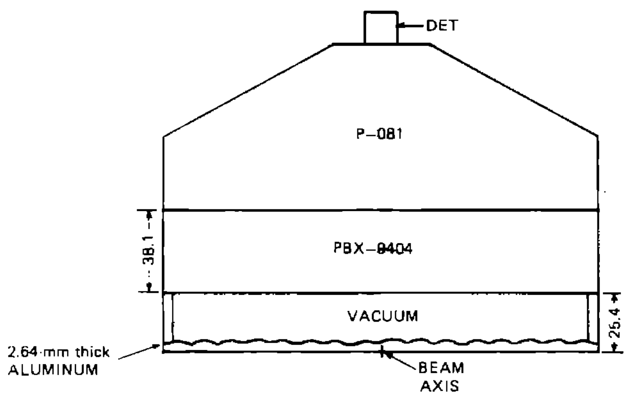
Experimenter: Roger W. Taylor

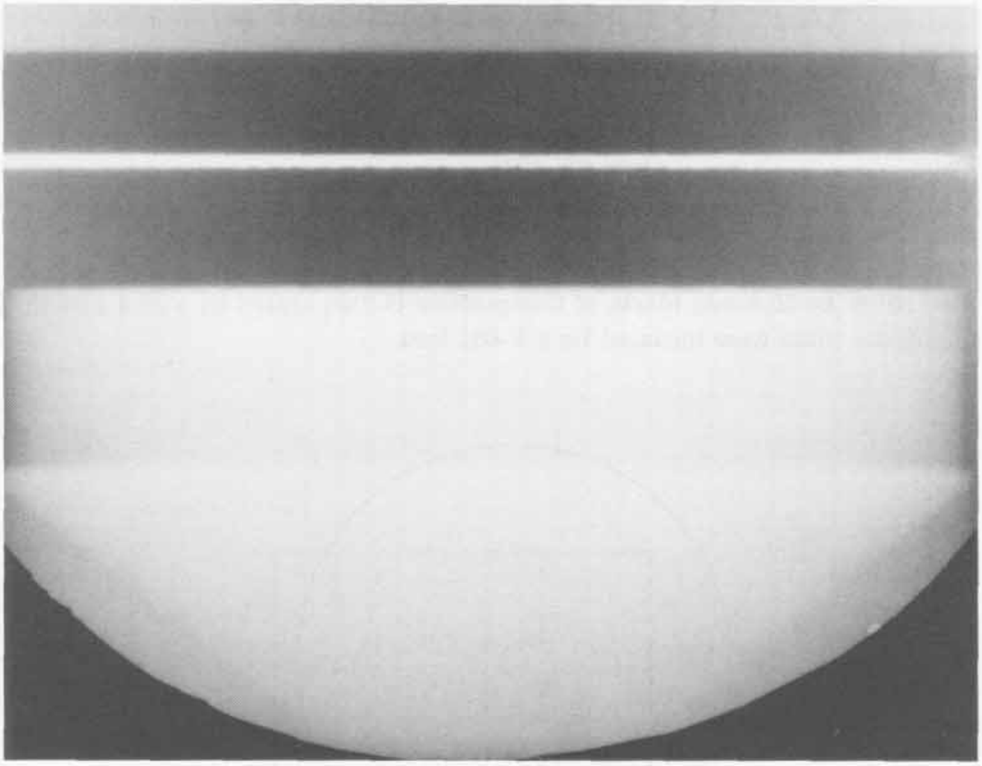
Radiographic Time: 34.31 μs

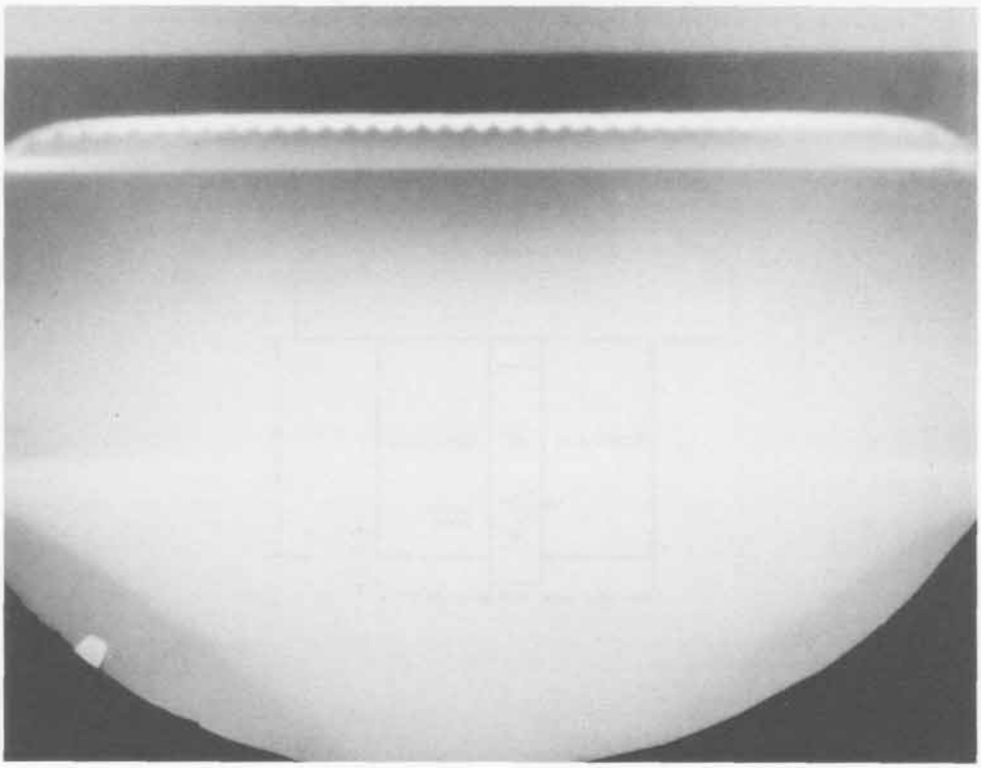
Reference: Barnes et al., 1974

A 2.64-mm-thick plate of 1100 aluminum with uniform sinusoidal surface grooves 0.203 mm deep and a wavelength of 5.08 mm was driven by detonation products from 38.1 mm of PBX-9404 initiated by a P-081 lens. The detonation products expanded 25.4 mm in a vacuum for 7.3 μs. The observed amplitude of the wave was 1.168 mm.



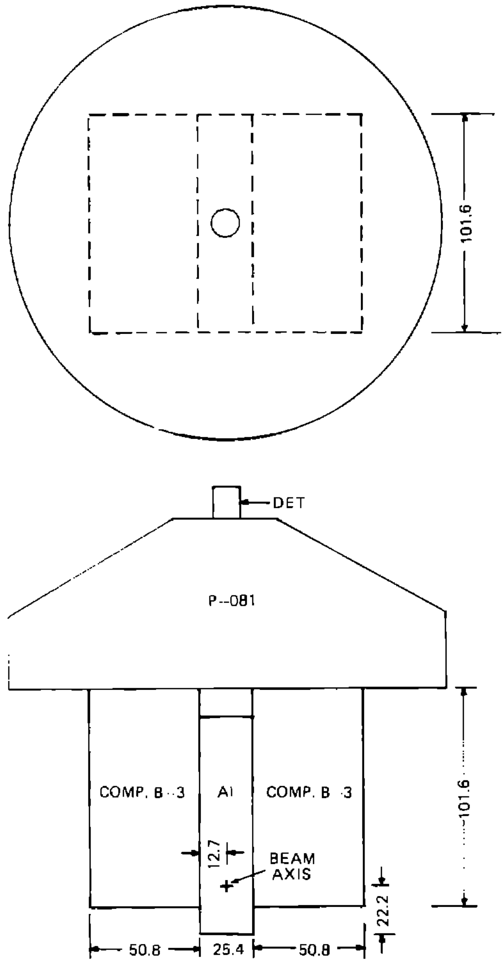


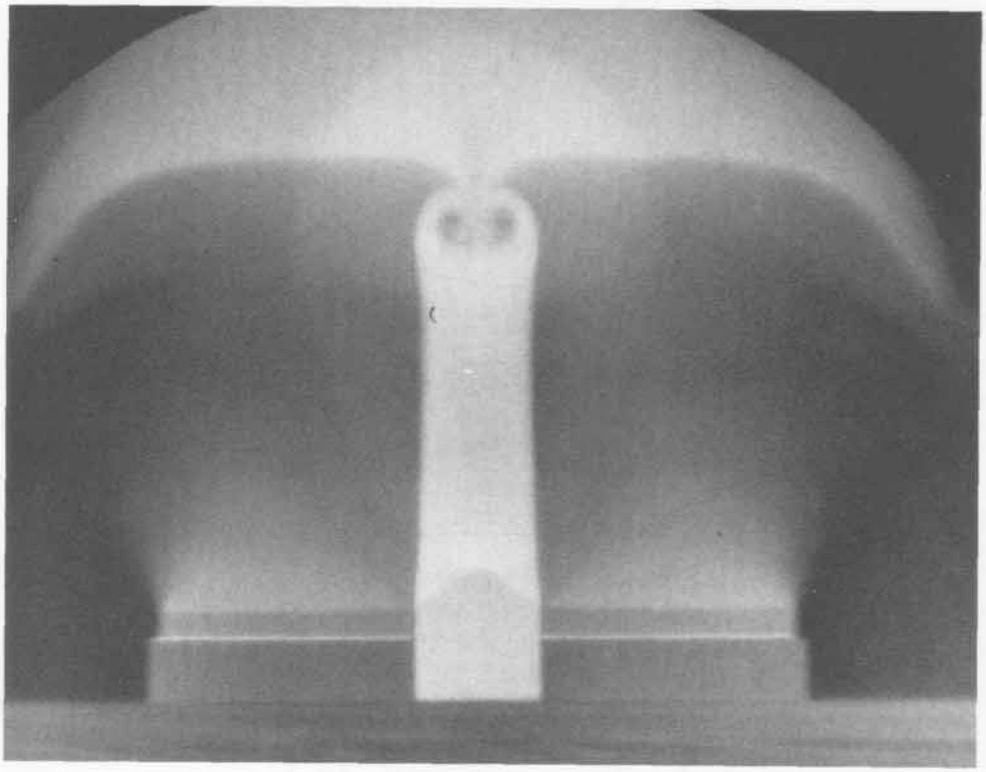




SHOT 1368:	**Aluminum Mach Reflection**
Date:	June 22, 1971
Experimenter:	Timothy R. Neal
Radiographic Time:	34.7 μs
Reference:	Neal, 1976a

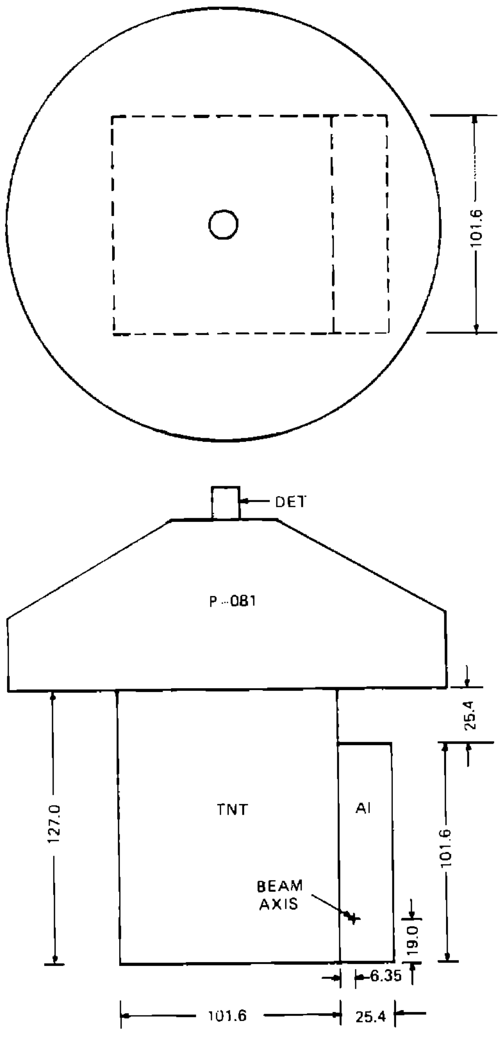
Two 101.6- by 50.8-mm blocks of Composition B-3 separated by a 25.4-mm-thick aluminum plate were initiated by a P-081 lens.

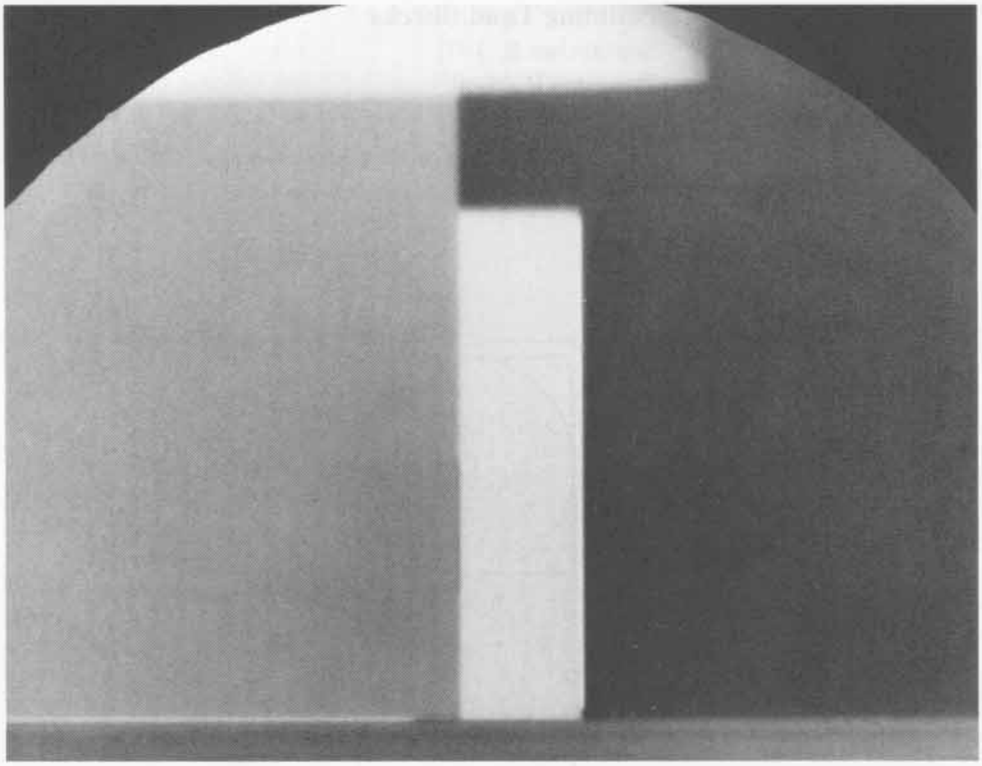


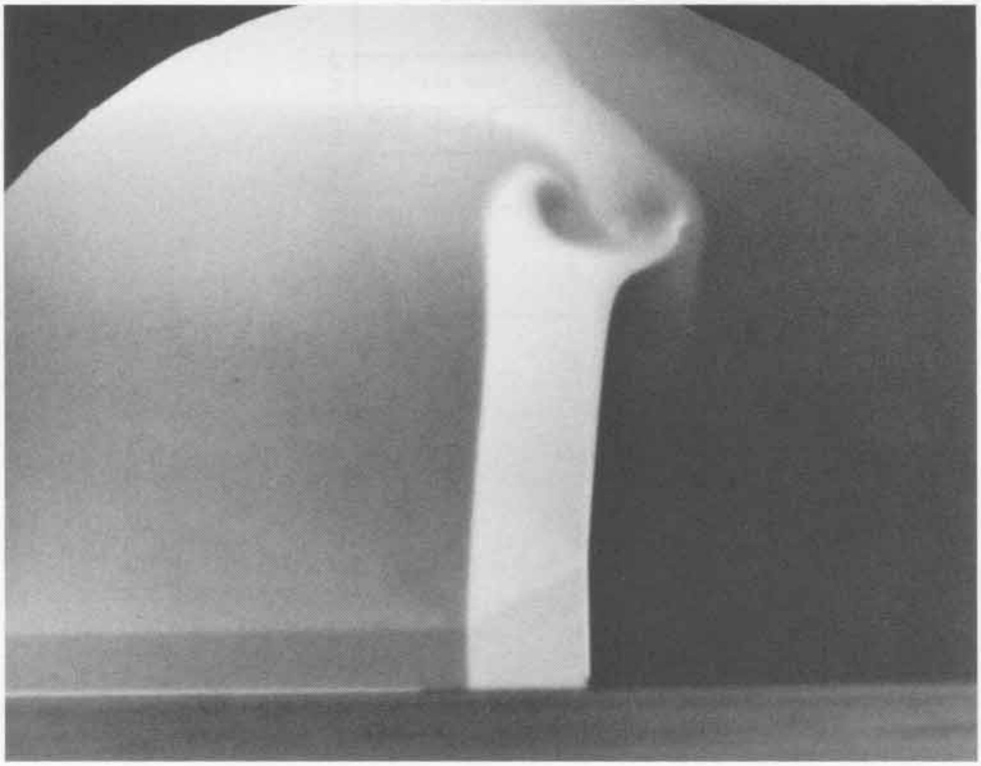


SHOT 1369: **Oblique Shock in Aluminum**
Date: June 22, 1971
Experimenter: Timothy R. Neal
Radiographic Time: 39.17 μs
Reference: Neal, 1976b

An oblique shock in 2024 aluminum was driven by 127.0 mm of TNT initiated by a P-081 lens.

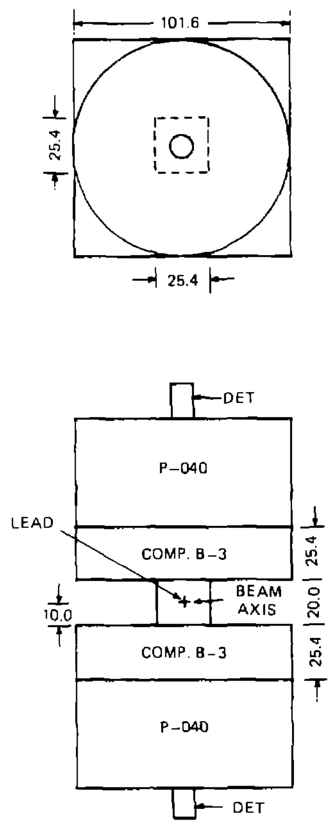


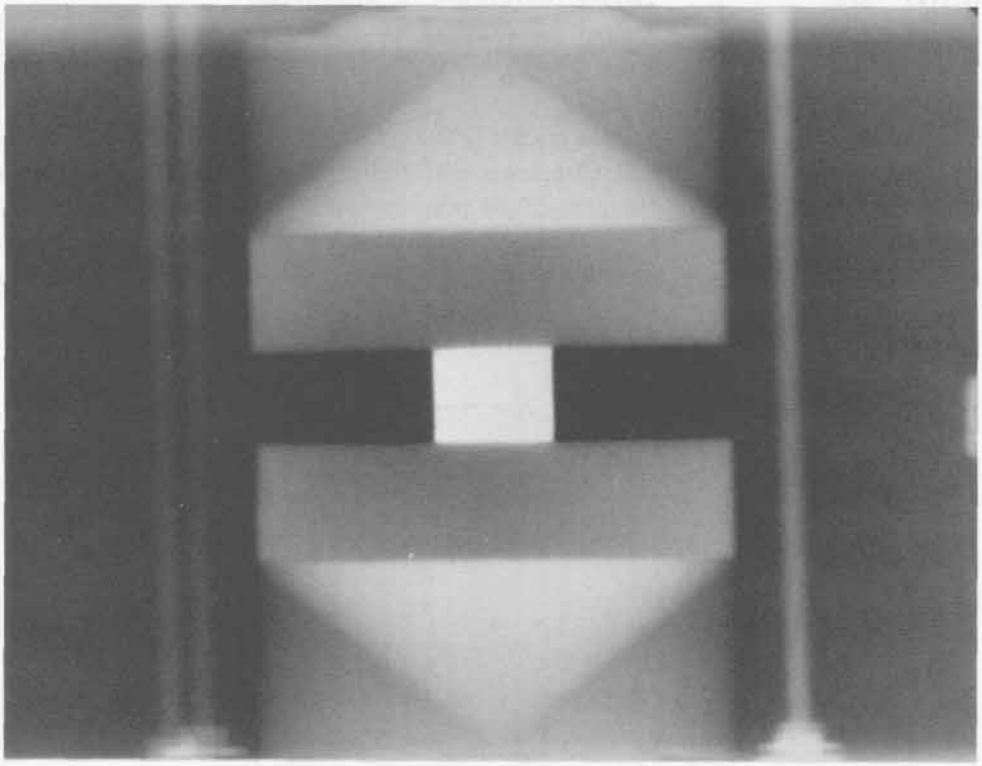


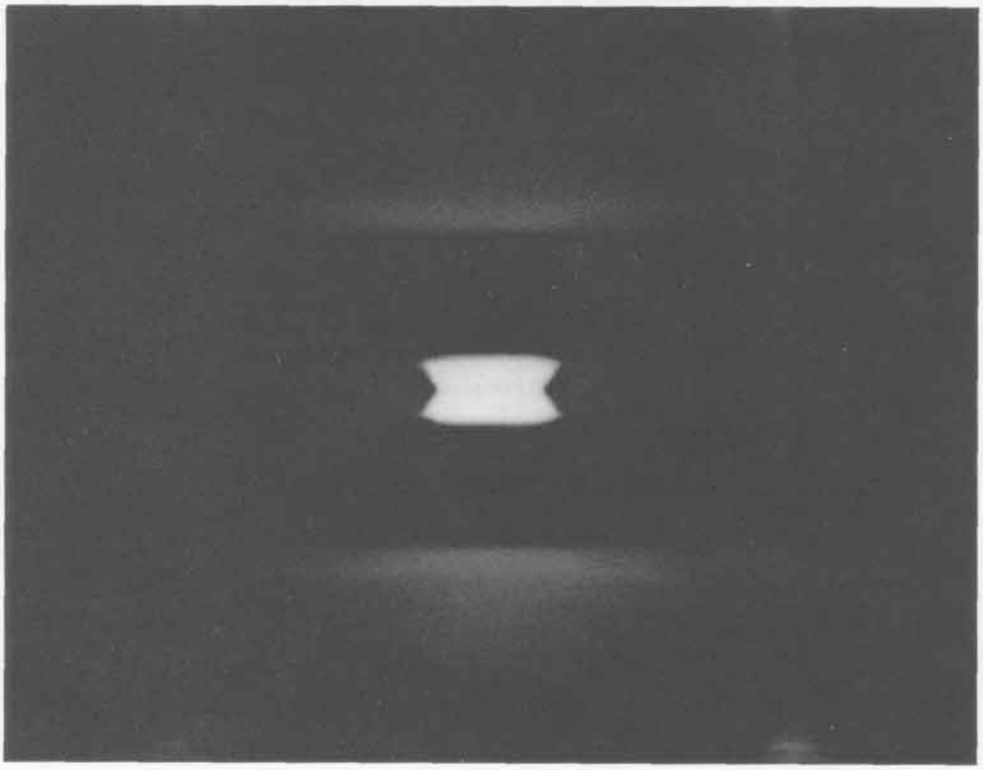


SHOT 1373: **Colliding Lead Shocks**
Date: September 2, 1971
Experimenter: Timothy R. Neal
Radiographic Time: 20.71 μs

Two 25.4-mm-thick slabs of Composition B-3 were simultaneously initiated by two P-040 lenses. The detonation waves interacted with a 25.4-mm-square, 20.0-mm-high lead block.

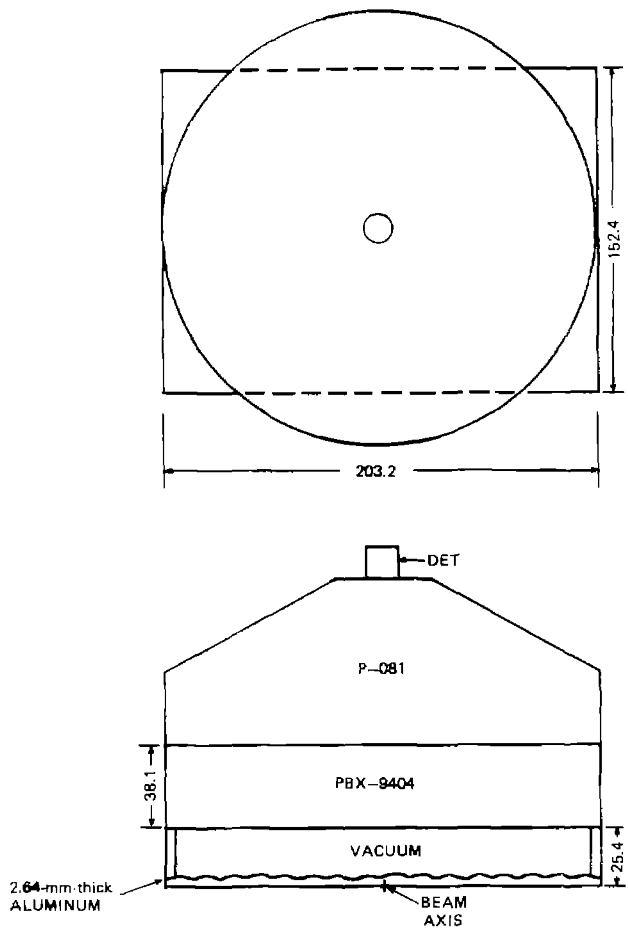


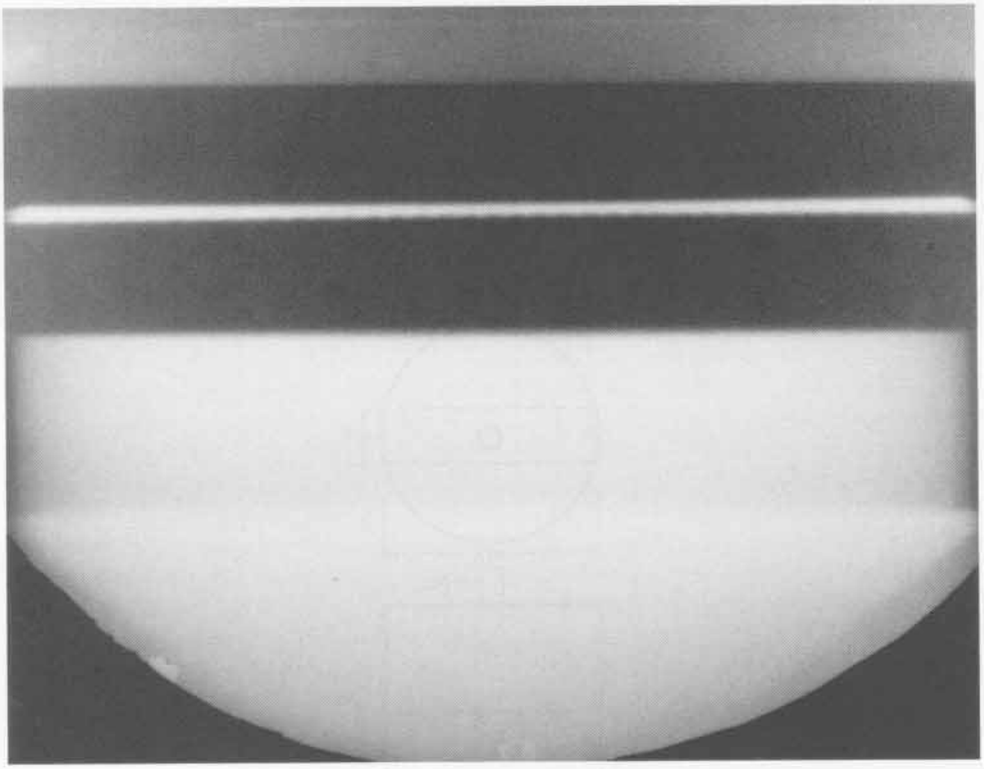


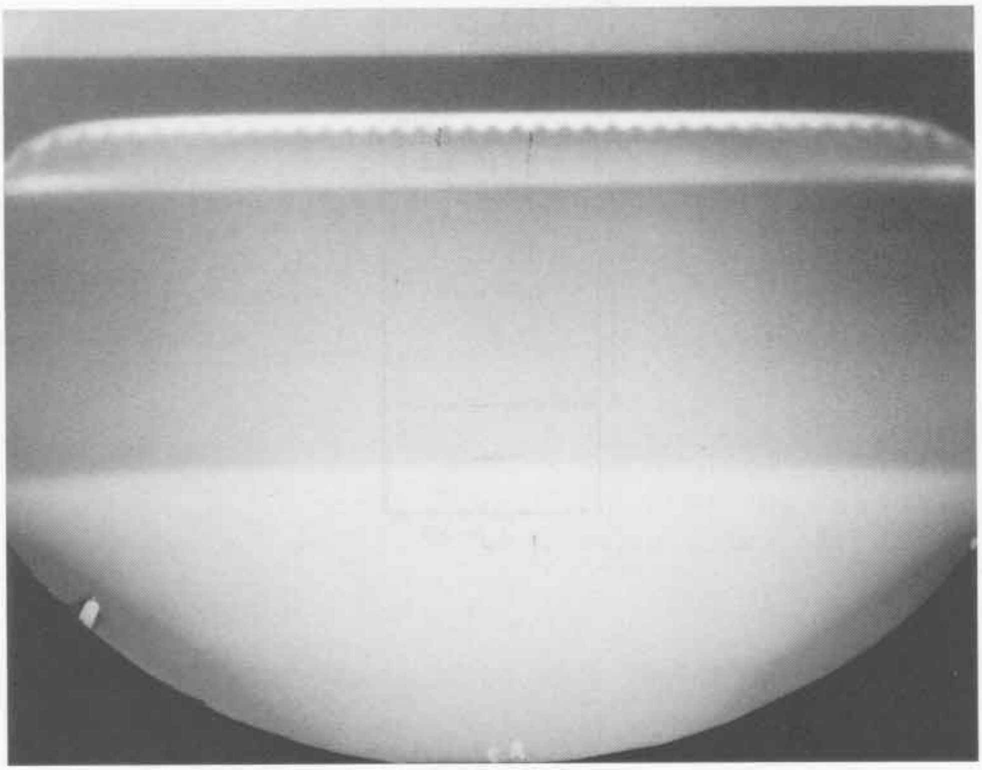


SHOT 1374:	**Taylor Instability in Aluminum**
Date:	August 26, 1971
Experimenter:	Roger W. Taylor
Radiographic Time:	35.08 μs
Reference:	Barnes et al., 1974

A 2.64-mm-thick plate of 6061 aluminum with uniform sinusoidal surface grooves 0.203 mm deep and a wavelength of 5.08 mm was driven by detonation products from 38.1 mm of PBX-9404 initiated by a P-081 lens. The detonation products expanded 25.4 mm in a vacuum for 8.1 μs. The observed amplitude of the wave was 1.127 mm.

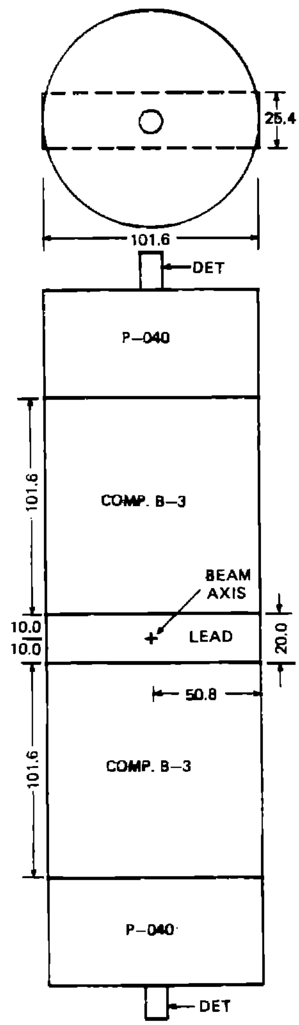


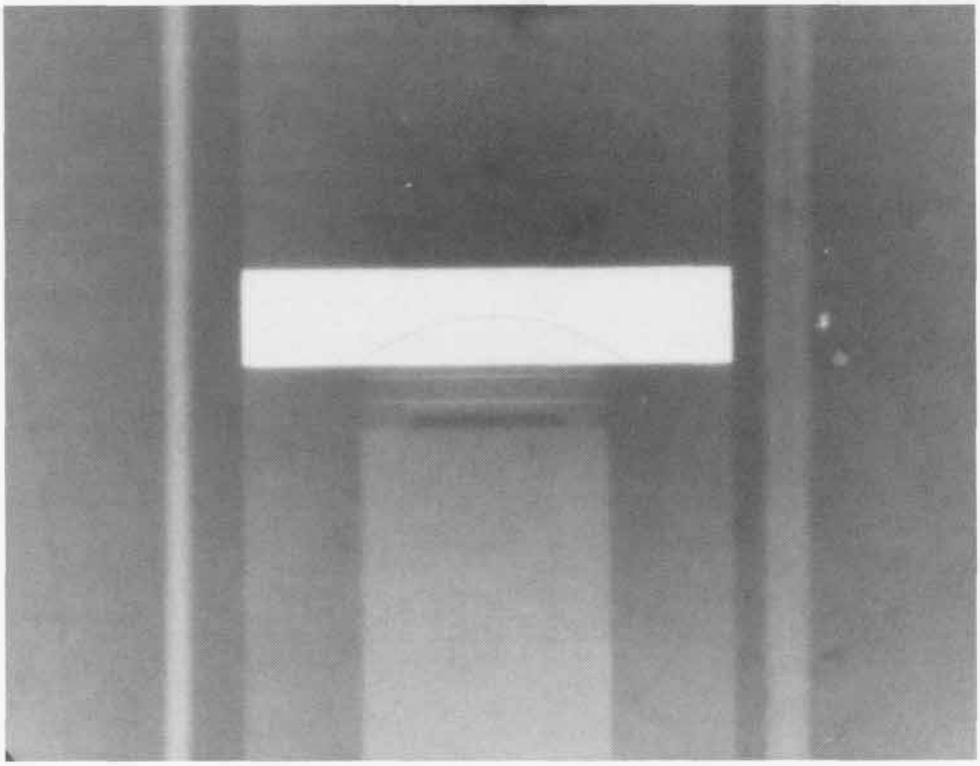


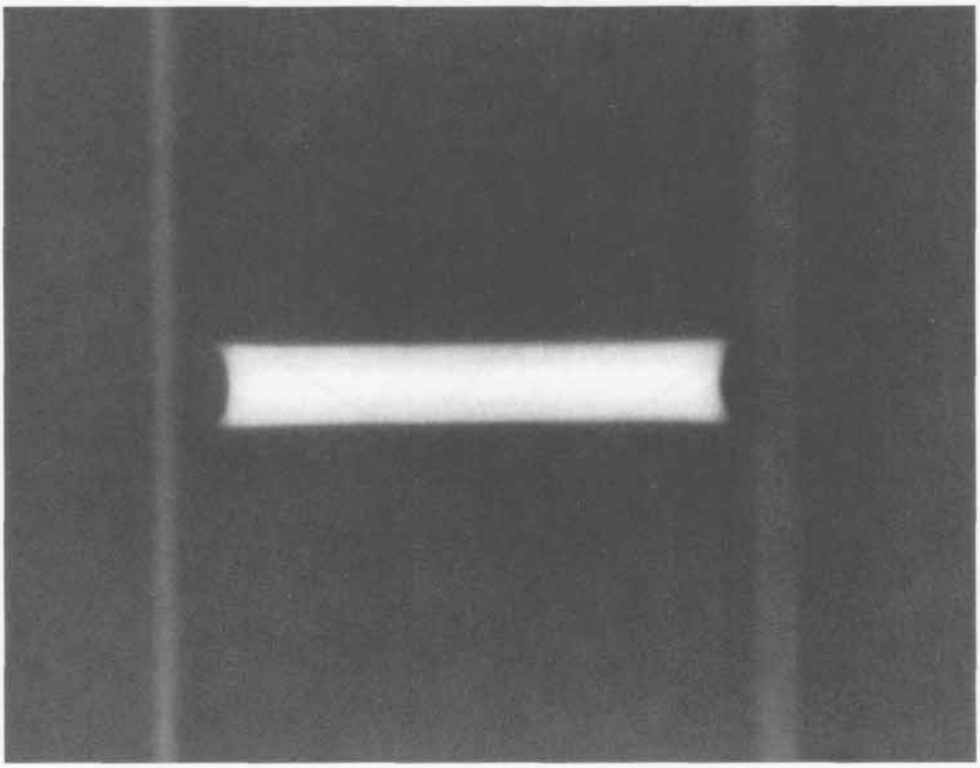


SHOT 1389: **Colliding Lead Shocks**
Date: June 1, 1972
Experimenter: Timothy R. Neal
Radiographic Time: 30.35 μs

Two 101.6-mm-square by 25.4-mm-wide slabs of Composition B-3 were initiated by P-040 lenses. The detonation waves interacted with 20.0 mm of lead. The reflected shock velocity was 3.11 mm/μs.

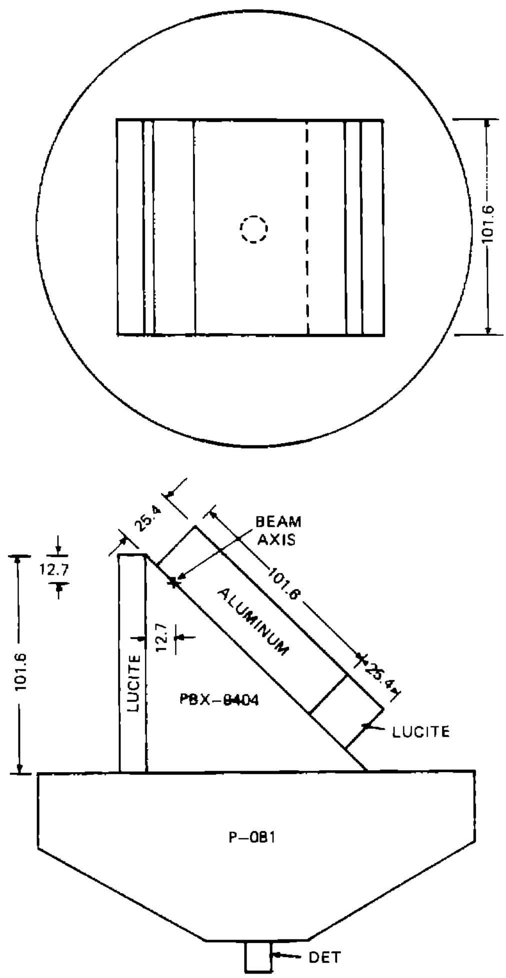


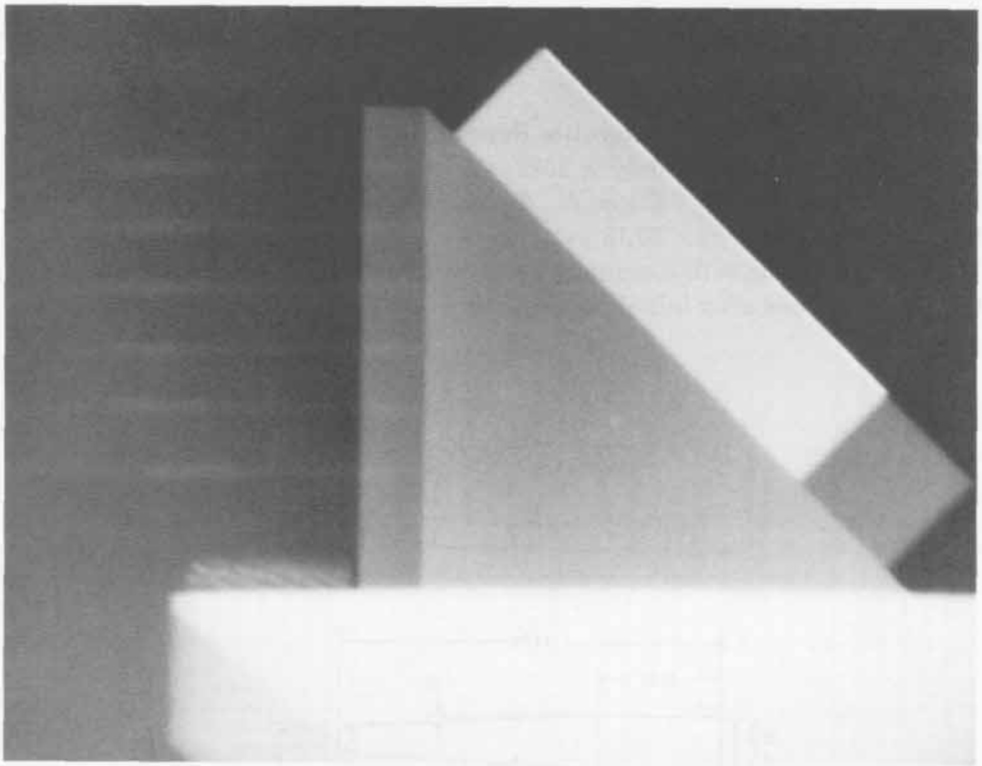


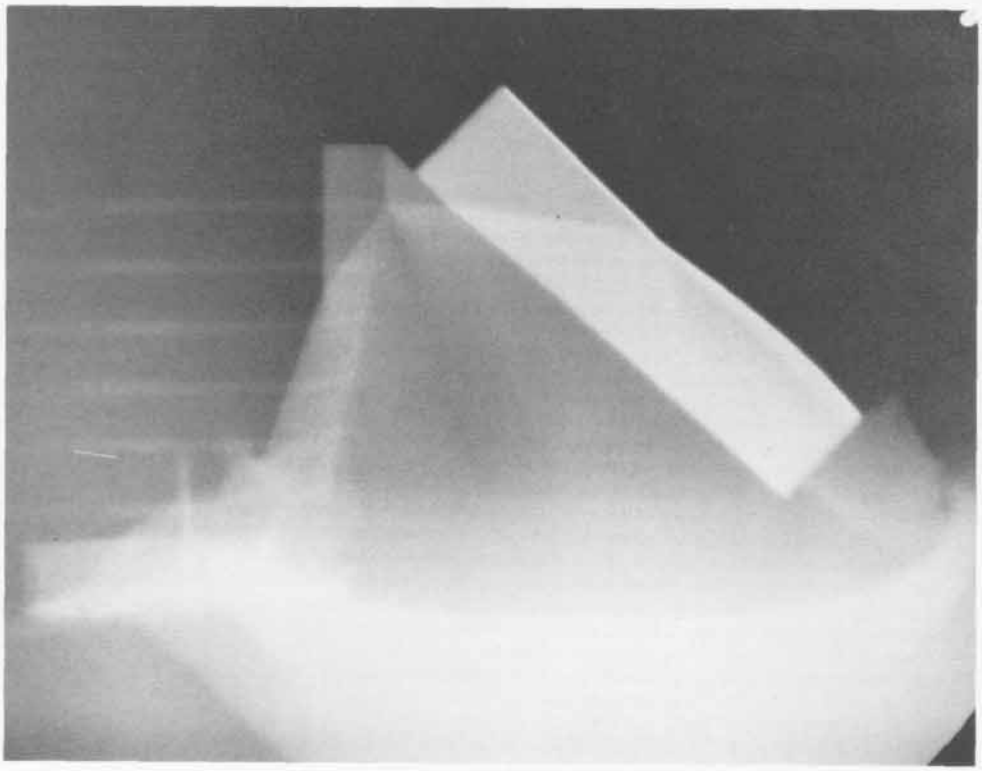


SHOT 1396: **Oblique Shock in Aluminum**
Date: June 27, 1973
Experimenter: Timothy R. Neal
Radiographic Time: 32.7 μs
reference: Neal, 1976b

An oblique shock in 2024 aluminum was driven by a 45° wedge of PBX-9404 initiated by a P-081 lens. An oblique shock is also driven into the Lucite sample.

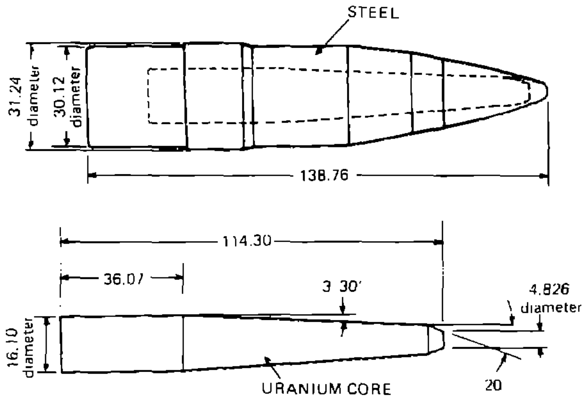


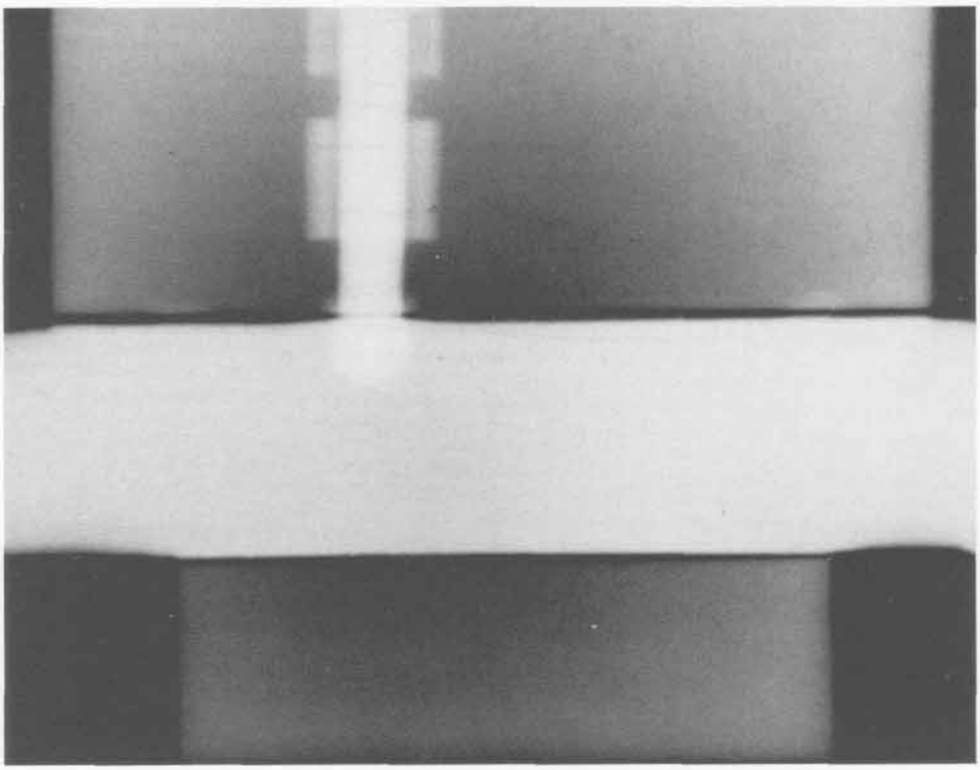




SHOT 1437: **Projectile Penetration of a Steel Plate**
Date: July 7, 1972
Experimenter: Roger W. Taylor
Radiographic Time: 30.13 μs

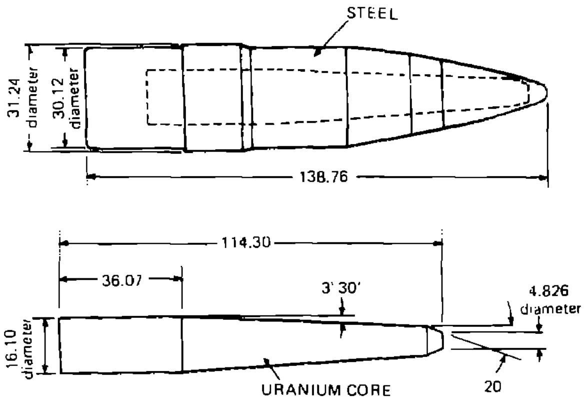
A 30-mm projectile with a uranium core impacted a 50.8-mm-thick plate at 2400 ft/s. The time was after initial impact. See also Shots 1438, 1439, 1443, and 1446.

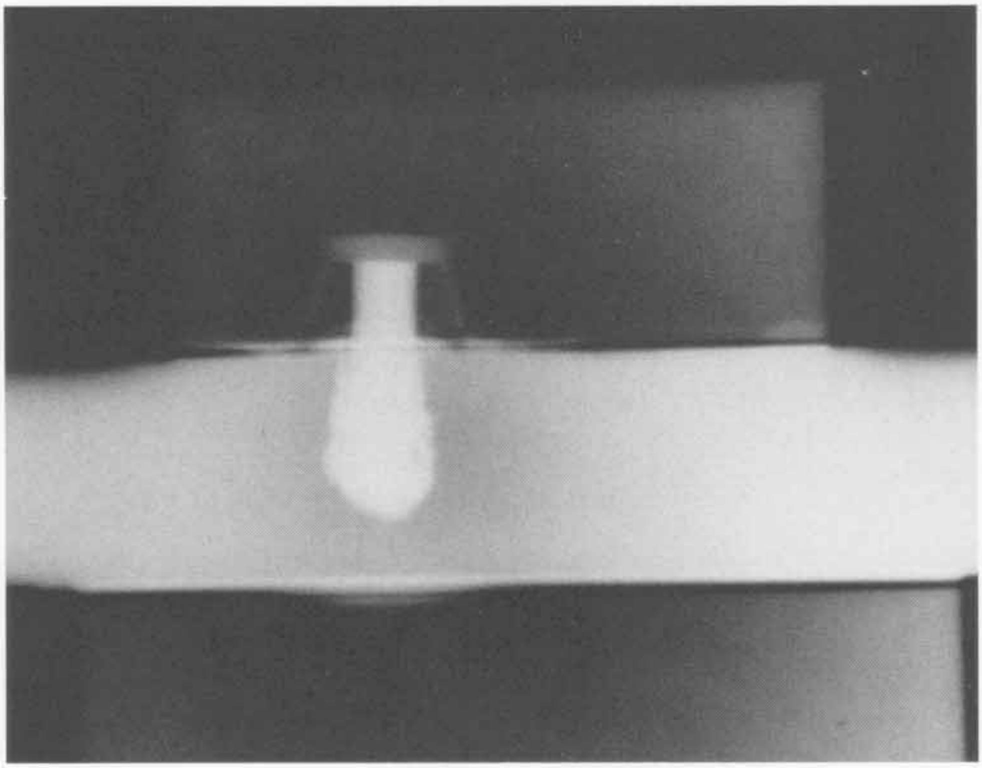




SHOT 1438: **Projectile Penetration of a Steel Plate**
Date: July 10, 1972
Experimenter: Roger W. Taylor
Radiographic Time: 100.18 μs

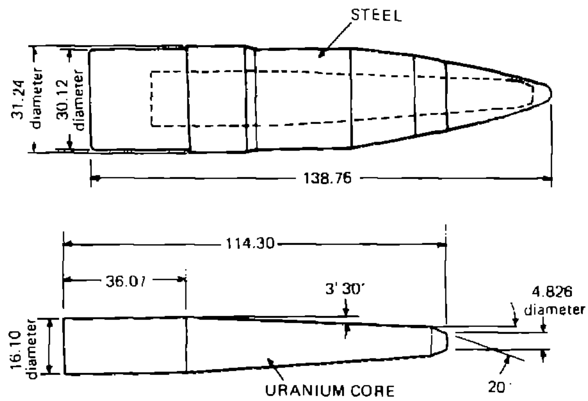
A 30-mm projectile with a uranium core impacted a 50.8-mm-thick steel plate at 2400 ft/s. The time was after initial impact. See also Shots 1437, 1439, 1443, and 1446.

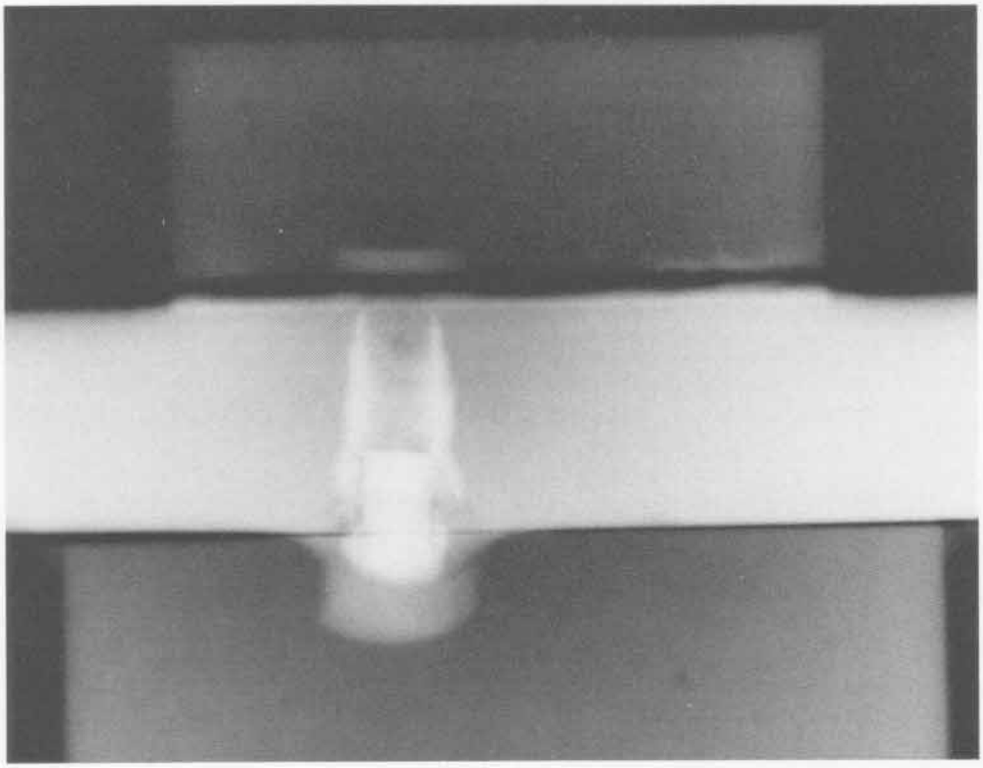




SHOT 1439: **Projectile Penetration of a Steel Plate**
Date: July 10, 1972
Experimenter: Roger W. Taylor
Radiographic Time: 225.10 μs

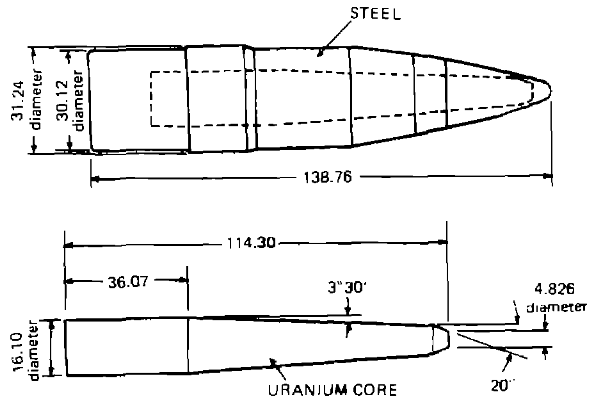
A 30-mm projectile with a uranium core impacted a 50.8-mm-thick steel plate at 2400 ft/s. The time was after initial impact. See also Shots 1437, 1438, 1443, and 1446.

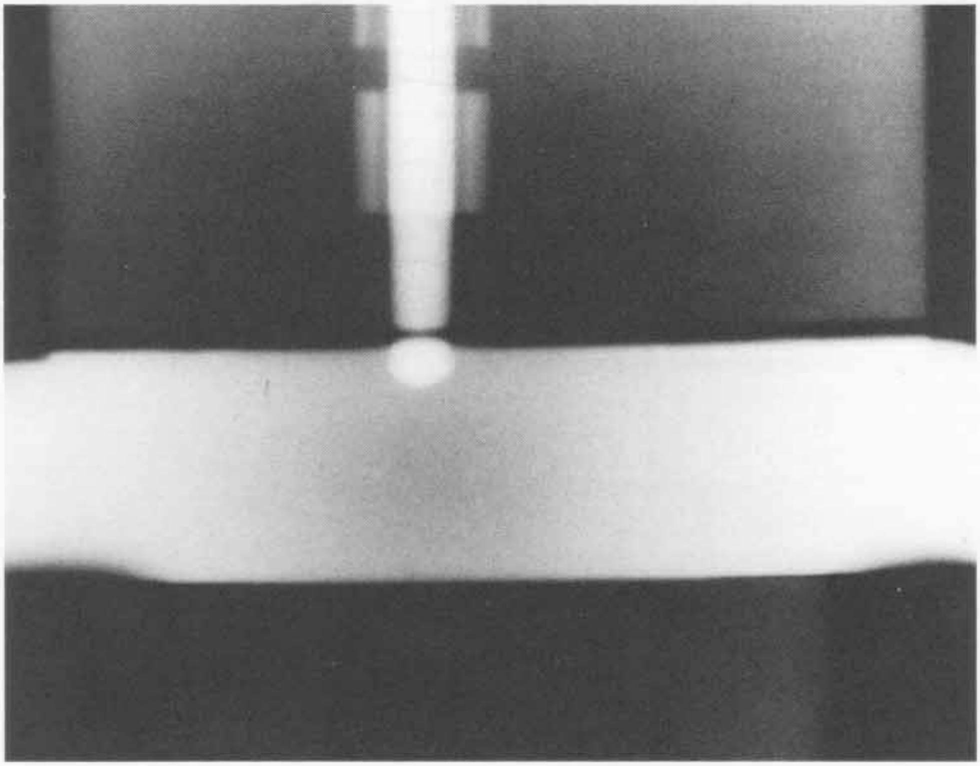




SHOT 1443: **Projectile Penetration of a Steel Plate**
Date: July 11, 1972
Experimenter: Roger W. Taylor
Radiographic Time: 15.15 μs

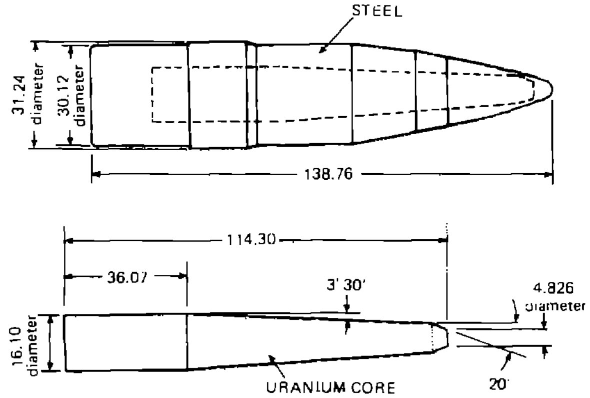
A 30-mm projectile with a uranium core impacted a 50.8-mm-thick steel plate at 2400 ft/s. The time was after initial impact. See also Shots 1437-1439, and 1446.

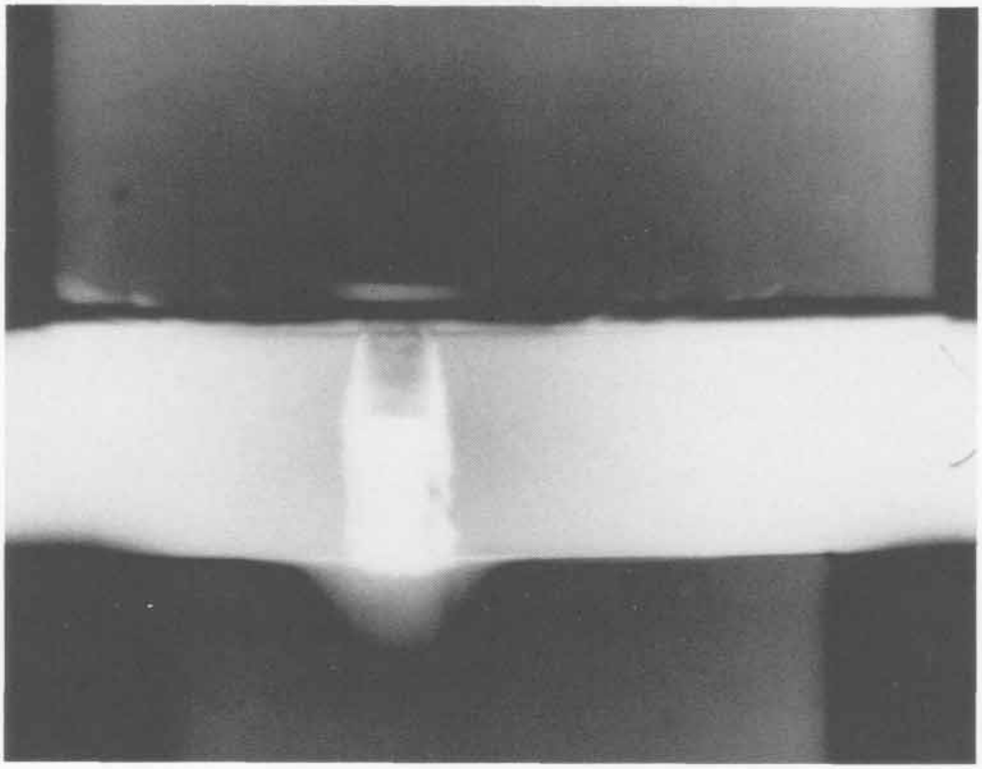




SHOT 1446: **Projectile Penetration of a Steel Plate**
Date: July 11, 1972
Experimenter: Roger W. Taylor
Radiographic Time: 180.10 μs

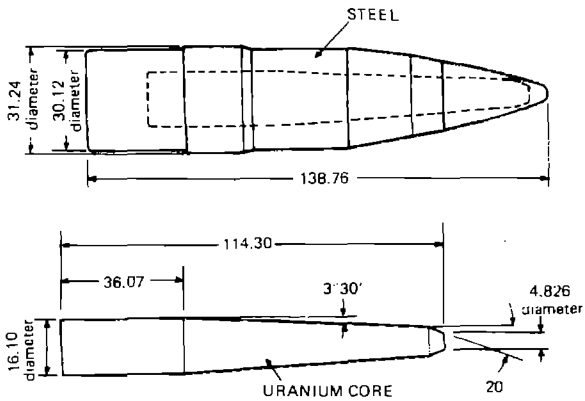
A 30-mm projectile with a uranium core impacted a 50.8-mm-thick steel plate at 2400 ft/s. The time was after initial impact. See also Shots 1437-1439, and 1443.

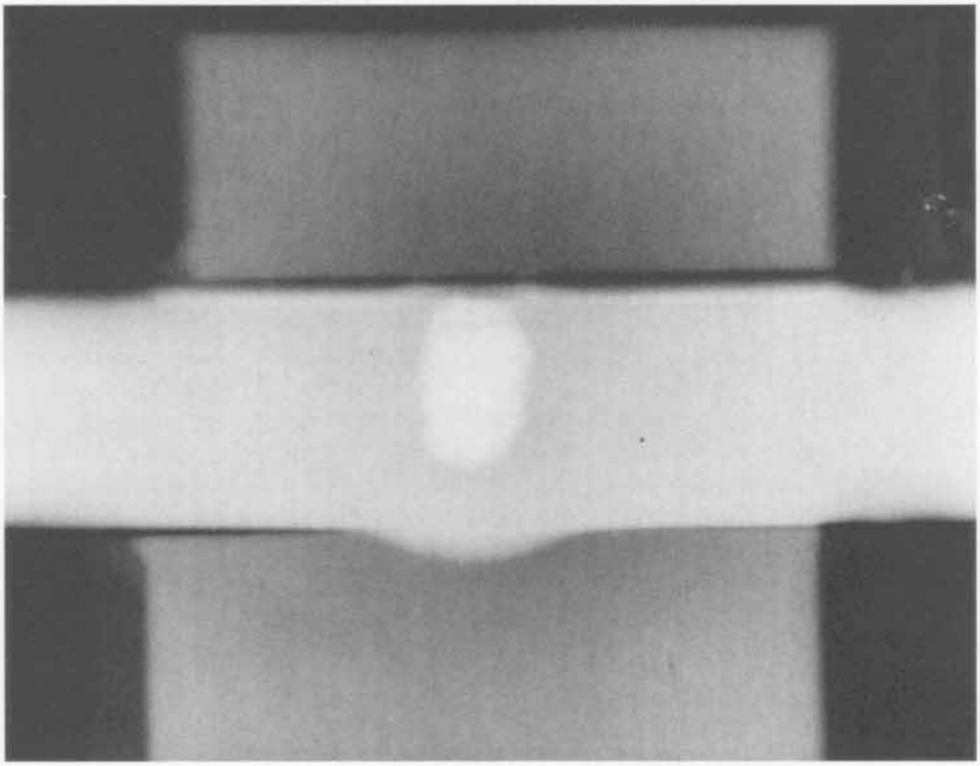




SHOT 1448: **Projectile Penetration of a Steel Plate**
Date: July 11, 1972
Experimenter: Roger W. Taylor
Radiographic Time: Static

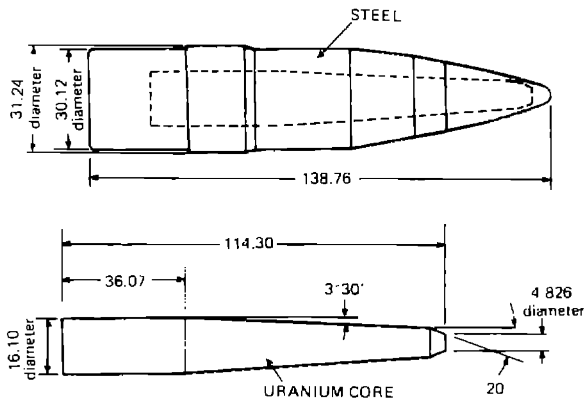
A 30-mm projectile with a uranium core impacted a 50.8-mm-thick steel plate at 2140 ft/s. See also Shots 1449 and 1450. The static shot shows the projectile core embedded in the steel plate.

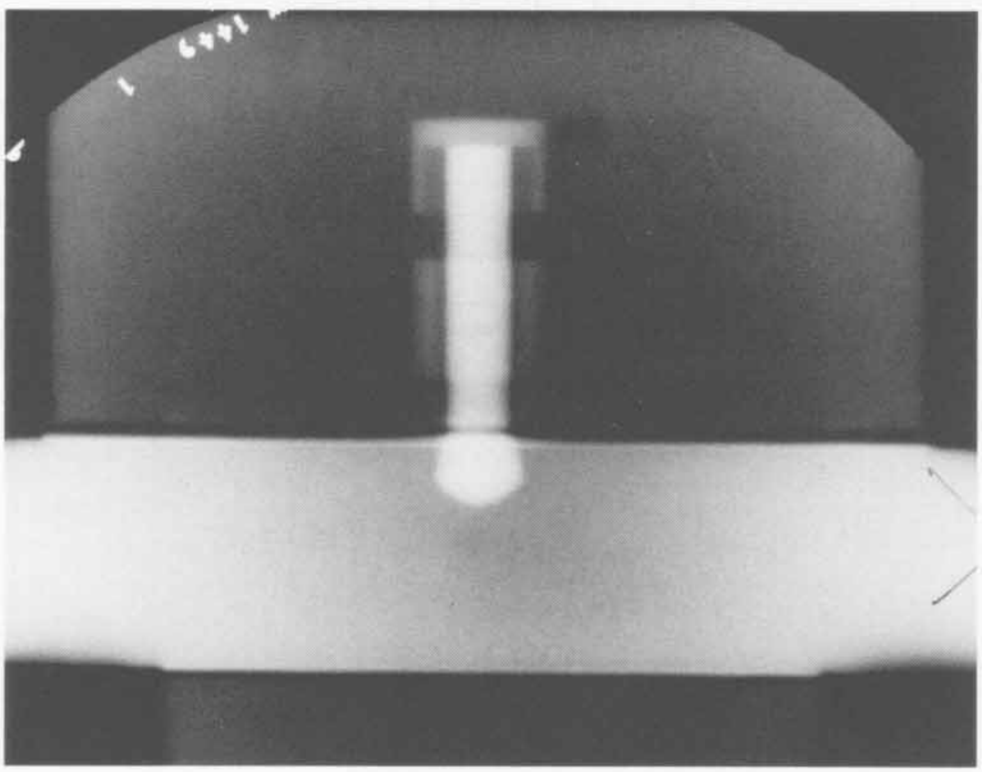




SHOT 1449: **Projectile Penetration of a Steel Plate**
Date: July 12, 1972
Experimenter: Roger W. Taylor
Radiographic Time: 35.06 μs

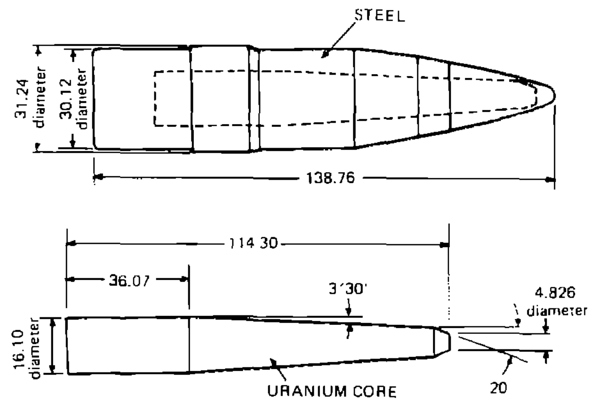
A 30-mm projectile with a uranium core impacted a 50.8-mm-thick steel plate at 2140 ft/s. The time was after initial impact. See also Shots 1448 and 1450.

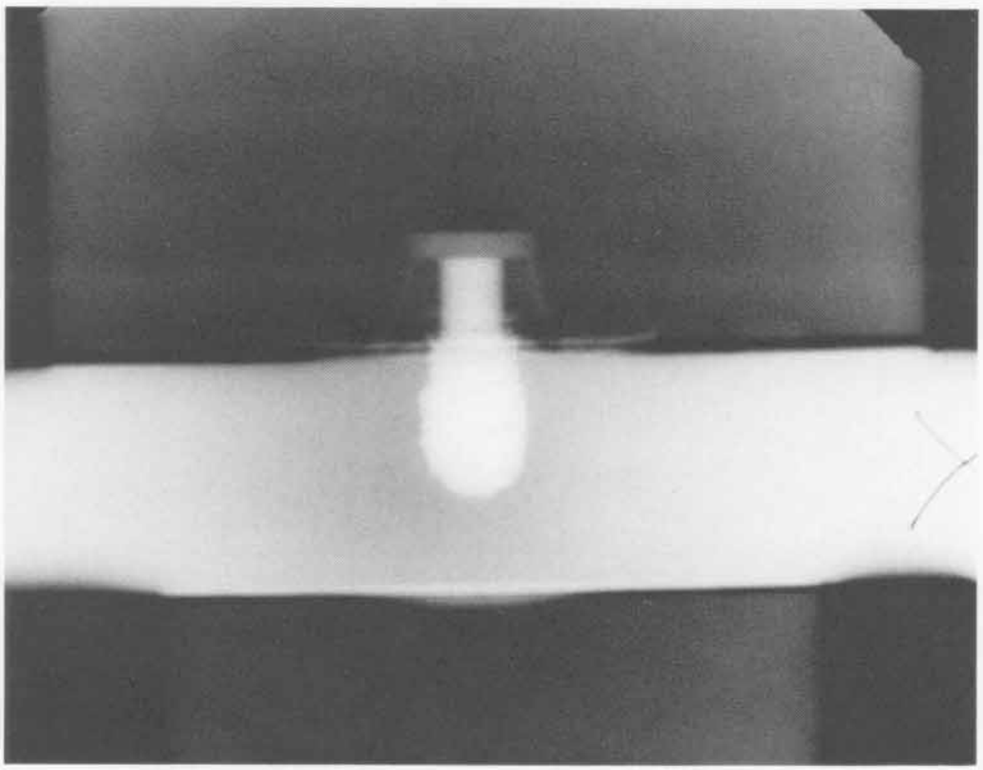




SHOT 1450: **Projectile Penetration of a Steel Plate**
Date: July 12, 1972
Experimenter: Roger W. Taylor
Radiographic Time: 115.19 μs

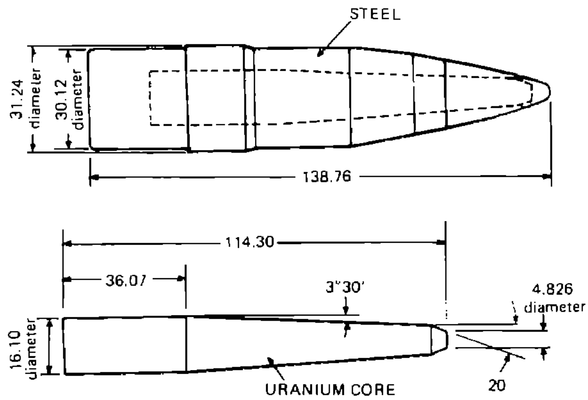
A 30-mm projectile with a uranium core impacted a 50.8-mm-thick steel plate at 2140 ft/s. The time was after initial impact. See also Shots 1448 and 1449.

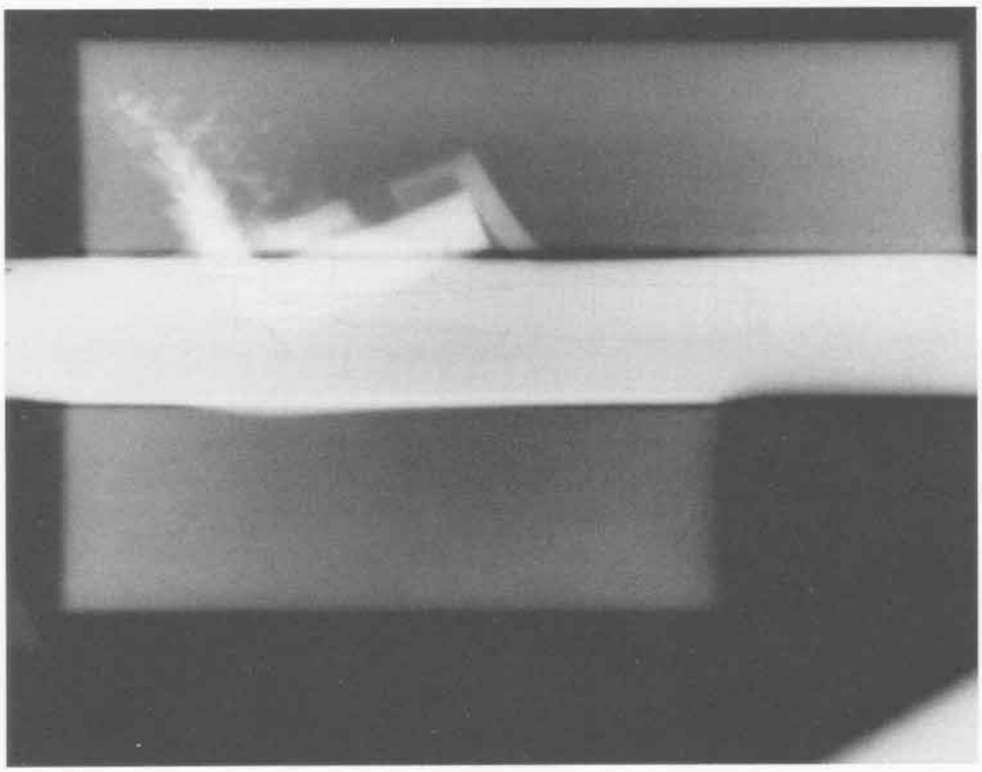




SHOT 1453: **Projectile Penetration of a Steel Plate**
Date: July 12, 1972
Experimenter: Roger W. Taylor
Radiographic Time: 80.12 μs

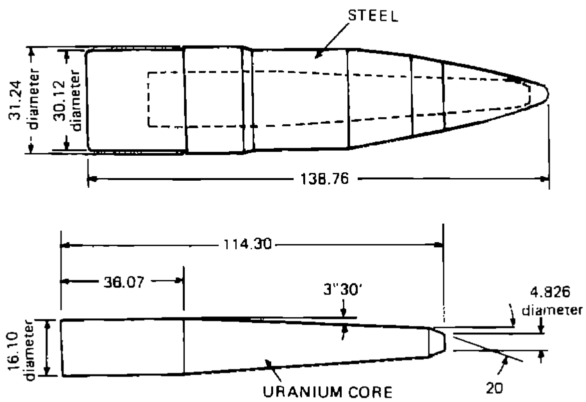
A 30-mm projectile with a uranium core impacted a 31.75-mm-thick steel plate at 3250 ft/s. The time was after initial impact. The projectile impacted the steel plate at 60° obliquity. See also Shots 1454-1456, and 1458.

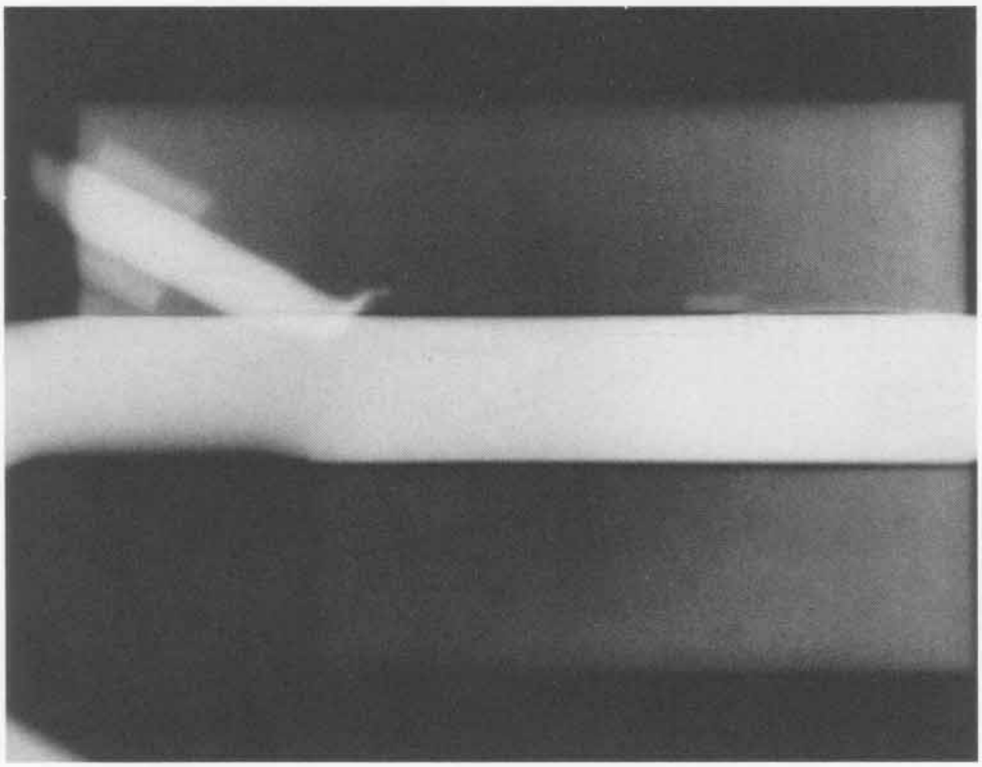




SHOT 1454: **Projectile Penetration of a Steel Plate**
Date: July 12, 1972
Experimenter: Roger W. Taylor
Radiographic Time: 15.11 μs

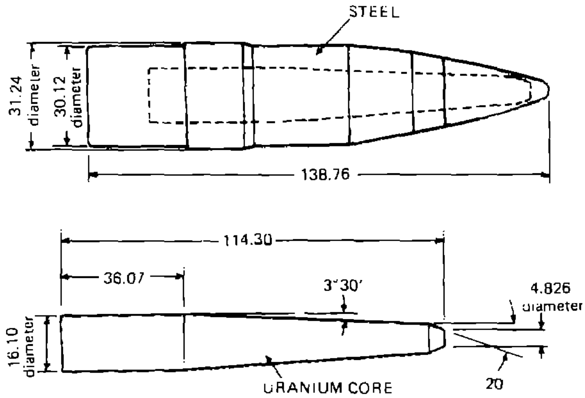
A 30-mm projectile with a uranium core impacted a 31.75-mm-thick steel plate at 3250 ft/s. The time was after initial impact. The projectile impacted the steel plate at 60° obliquity. See also Shots 1453, 1455, 1456, and 1458.

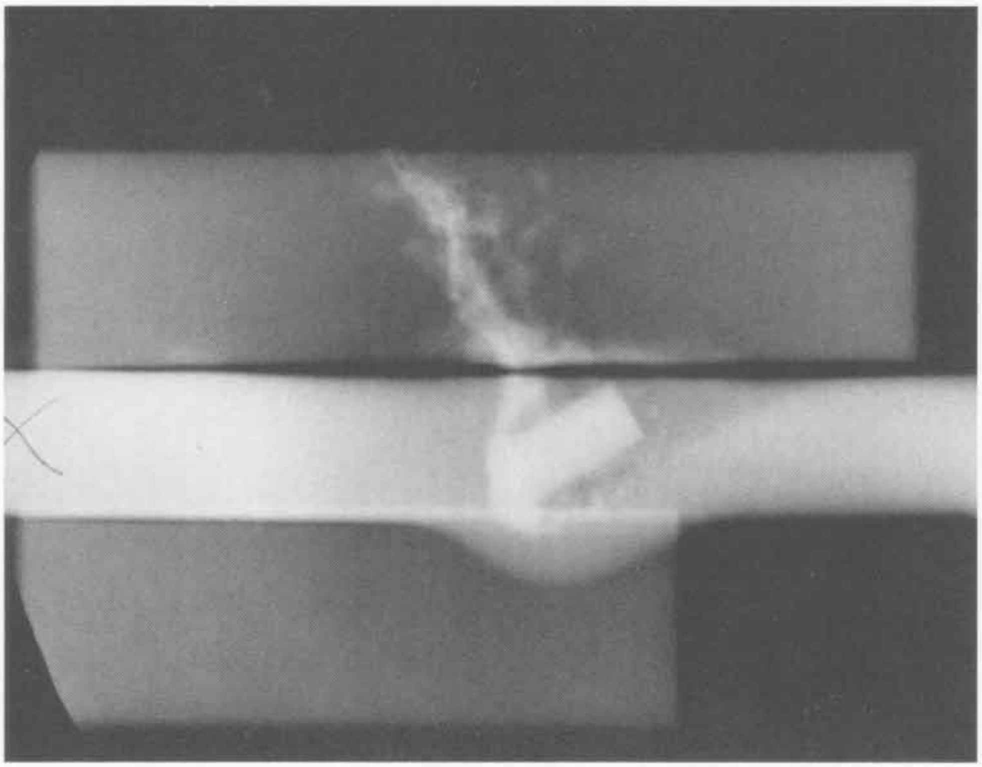




SHOT 1455: **Projectile Penetration of a Steel Plate**
Date: July 12, 1972
Experimenter: Roger W. Taylor
Radiographic Time: 140.11 μs

A 30-mm projectile with a uranium core impacted a 31.75-mm-thick steel plate at 3250 ft/s. The time was after initial impact. The projectile impacted the steel plate at 60° obliquity. See also Shots 1453, 1454, 1456, and 1458.





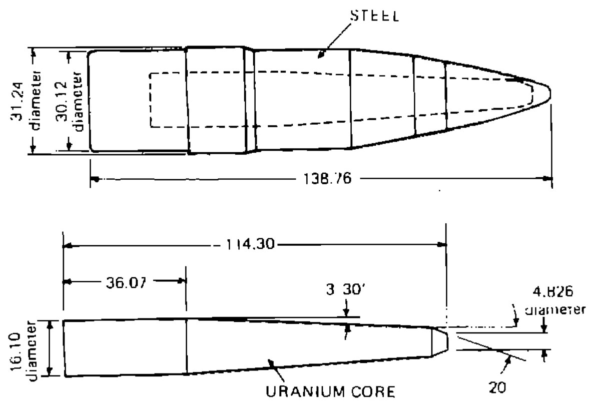
SHOT 1456: **Projectile Penetration of a Steel Plate**

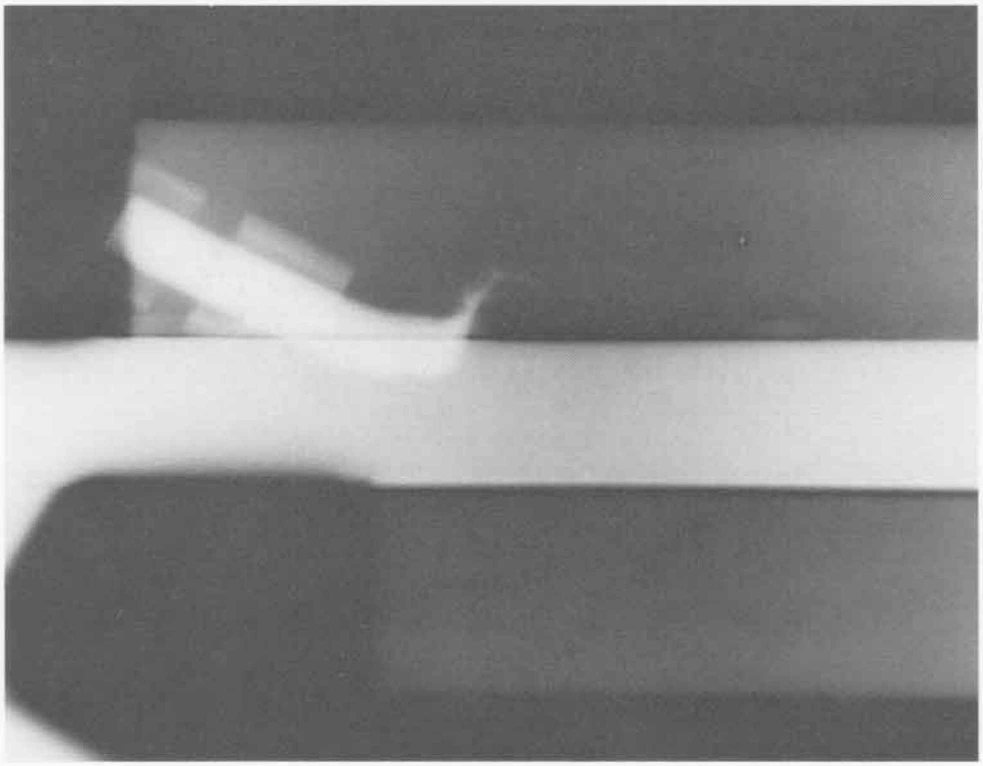
Date: July 12, 1972

Experimenter: Roger W. Taylor

Radiographic Time: 40.12 μs

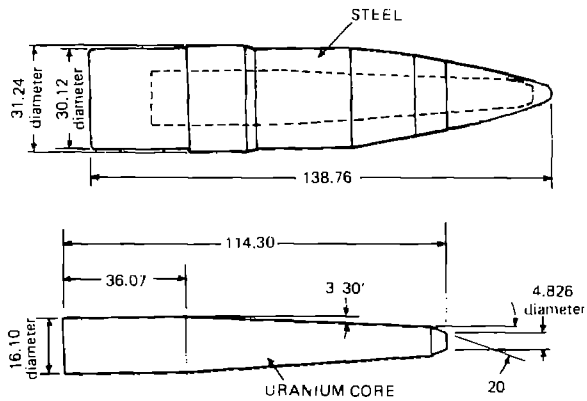
A 30-mm projectile with a uranium core impacted a 31.75-mm-thick steel plate at 3250 ft/s. The time was after initial impact. The projectile impacted the steel plate at 60° obliquity. See also Shots 1453-1455, and 1458.

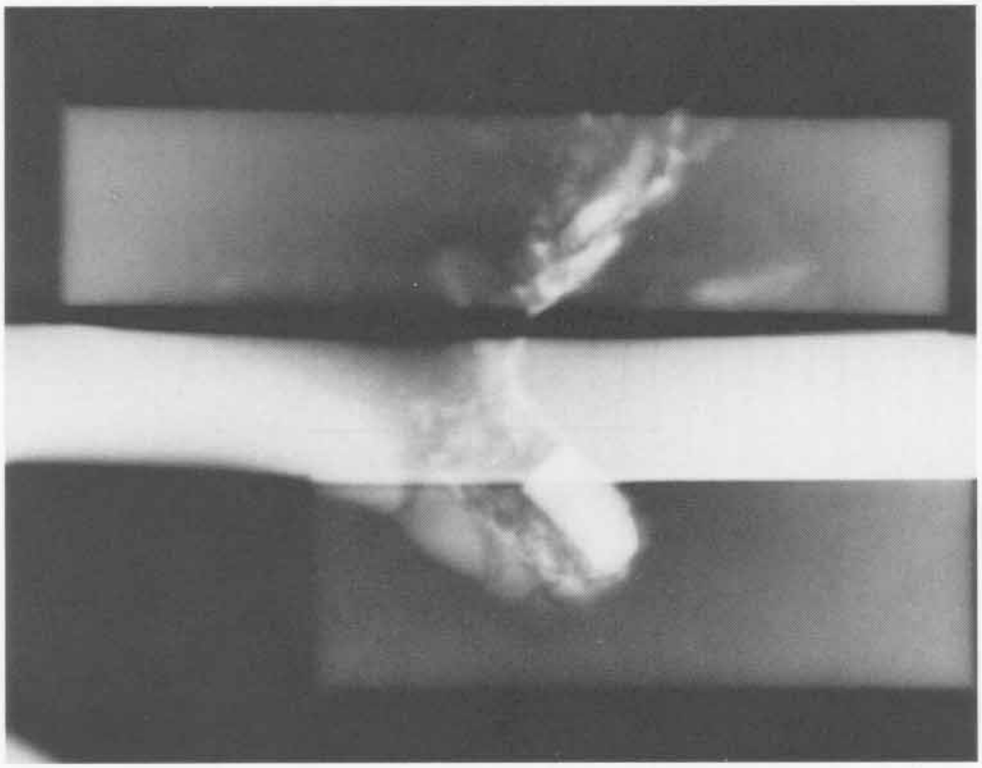




SHOT 1458: **Projectile Penetration of a Steel Plate**
Date: July 13, 1972
Experimenter: Roger W. Taylor
Radiographic Time: 200.25 μs

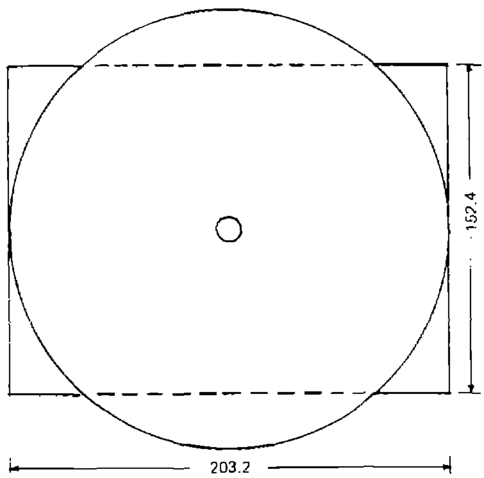
A 30-mm projectile with a uranium core impacted a 31.75-mm-thick steel plate at 3250 ft/s. The time was after initial impact. The projectile impacted the steel plate at 60° obliquity. See also Shots 1453-1456.

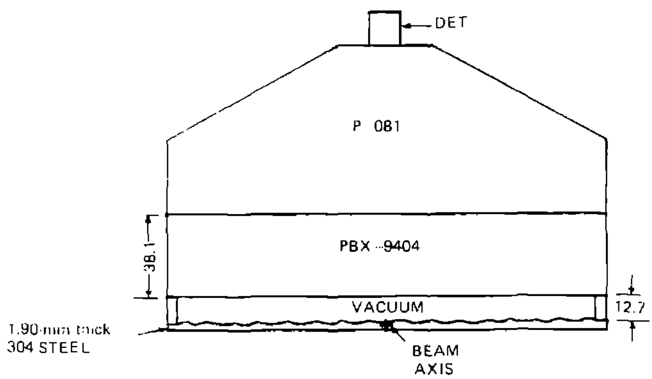


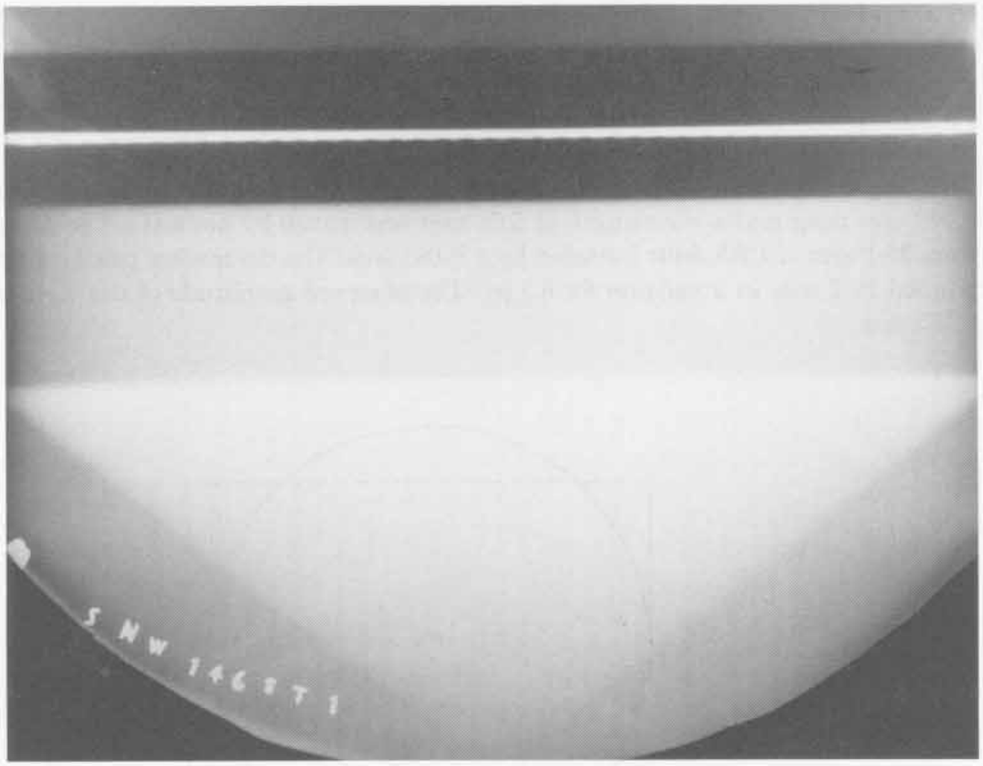


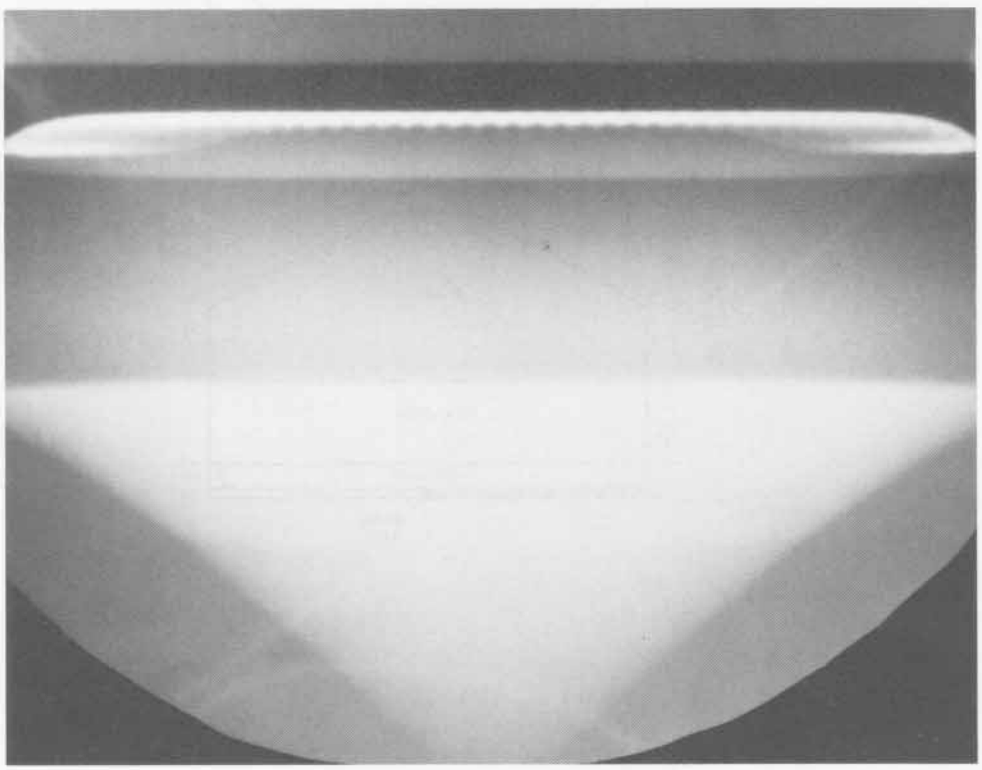
SHOT 1468: **Taylor Instability in Steel**
Date: October 25, 1972
Experimenter: Roger W. Taylor
Radiographic Time: 32.53 μs
Reference: Barnes et al., 1974

A 1.90-mm-thick plate of 304 stainless steel with uniform sinusoidal surface grooves 0.203 mm deep and a wavelength of 5.08 mm was driven by detonation products from 38.1 mm of PBX-9404 initiated by a P-081 lens. The detonation products expanded 12.7 mm in a vacuum for 5.5 μs. The observed amplitude of the wave is 0.476 mm.






S NW 1468 T 1



SHOT 1469: **Taylor Instability in Steel**

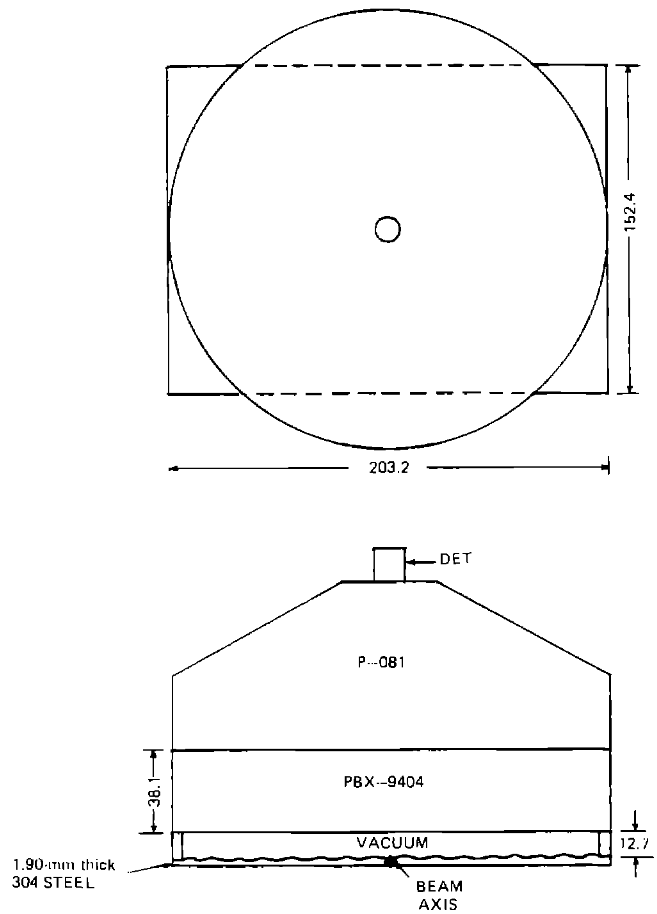
Date: October 26, 1972

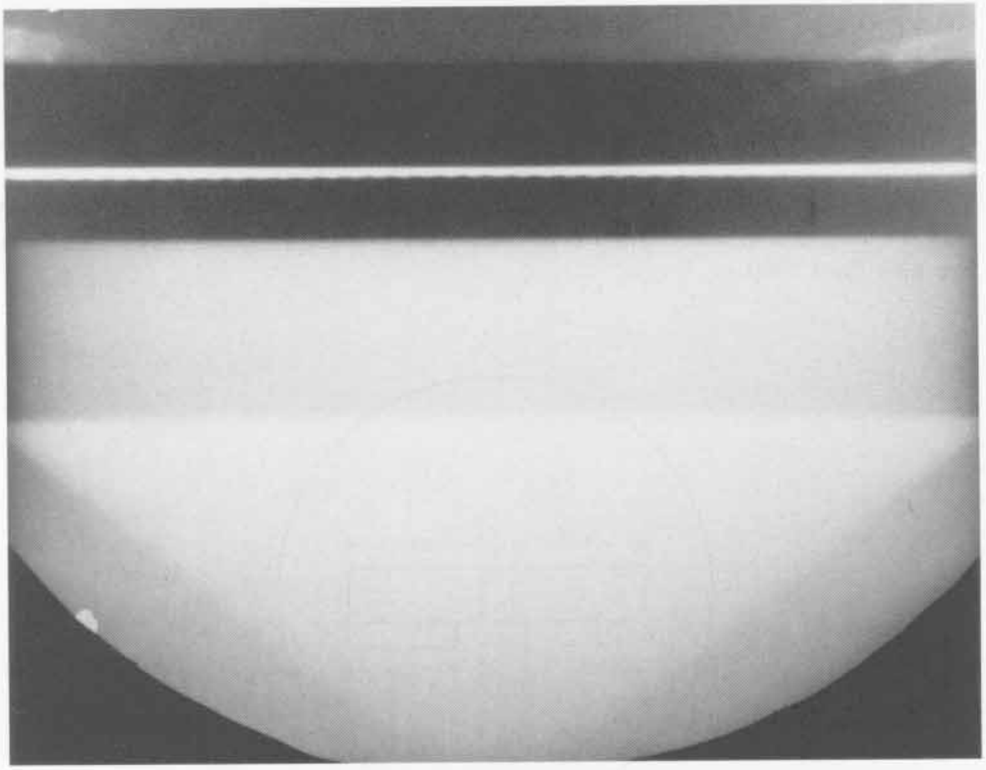
Experimenter: Roger W. Taylor

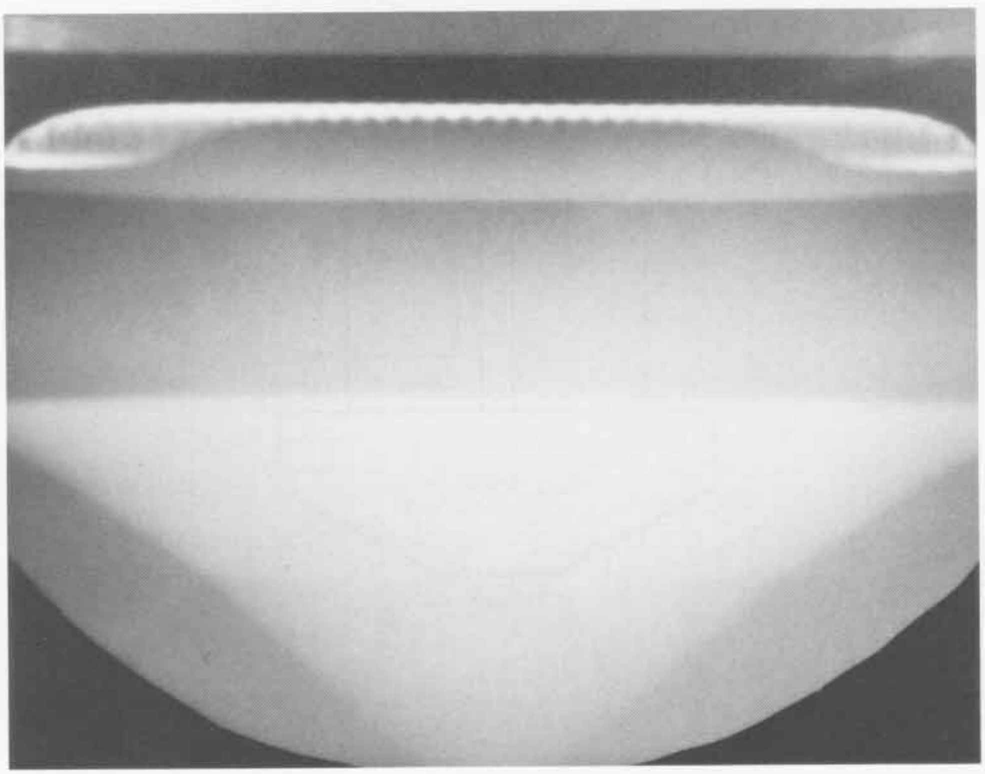
Radiographic Time: 34.09 μs

Reference: Barnes et al., 1974

A 1.90-mm-thick plate of 304 stainless steel with uniform sinusoidal surface grooves 0.203 mm deep and a wavelength of 5.08 mm was driven by detonation products from 38.1 mm of PBX-9404 initiated by a P-081 lens. The detonation products expanded 12.7 mm in a vacuum for 6.5 μs. The observed amplitude of the wave is 0.725 mm.

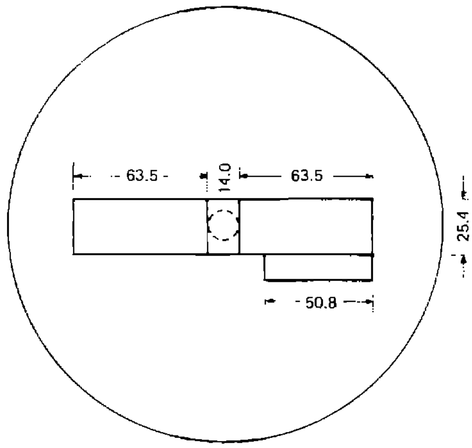


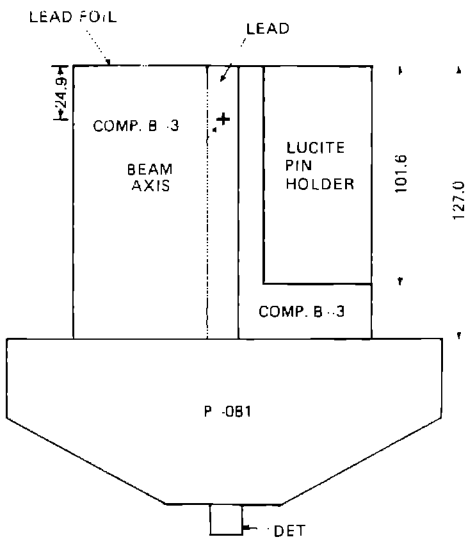


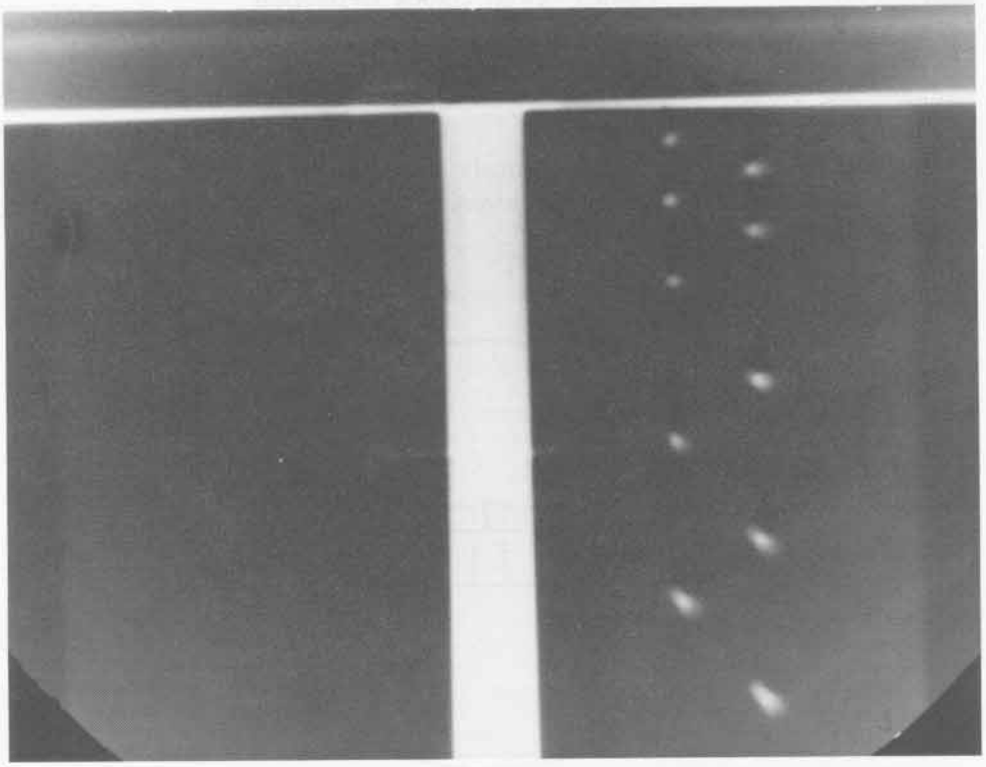


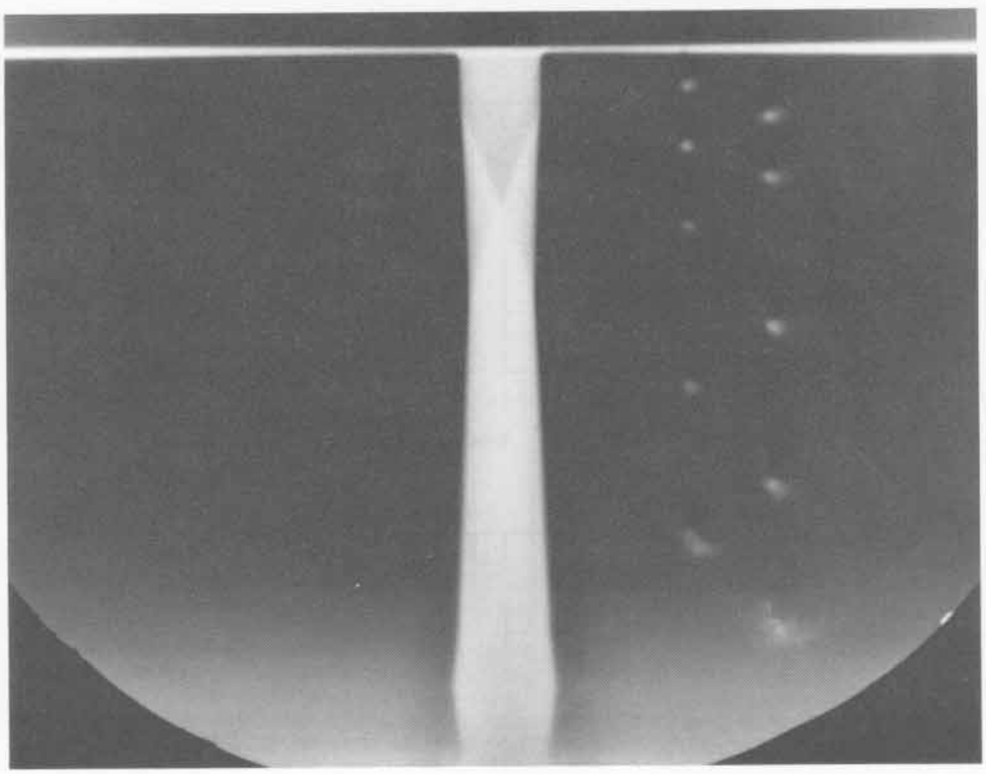
SHOT 1488: **Lead Regular Shock Reflection**
Date: June 26, 1973
Experimenter: Timothy R. Neal
Radiographic Time: 37.84 μs
Reference: Neal, 1977

Two blocks of Composition B-3 simultaneously initiated by a P-081 lens obliquely shocked 14.0 mm of lead. The shocks interacted to form a regular shock reflection. See also Shot 1489.



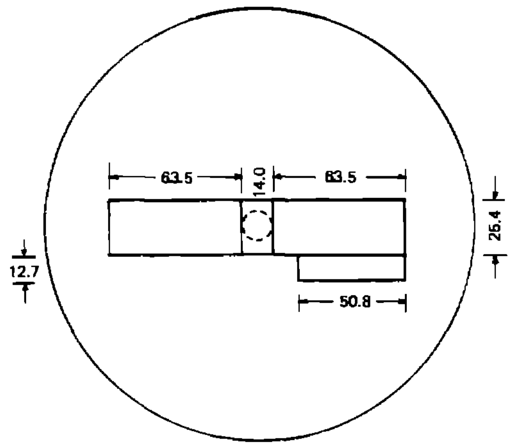


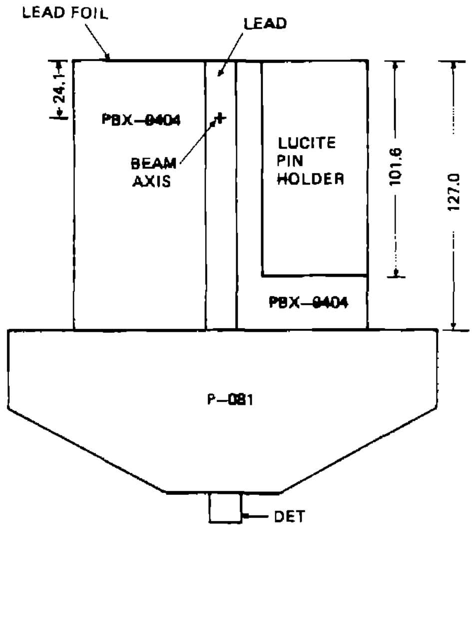


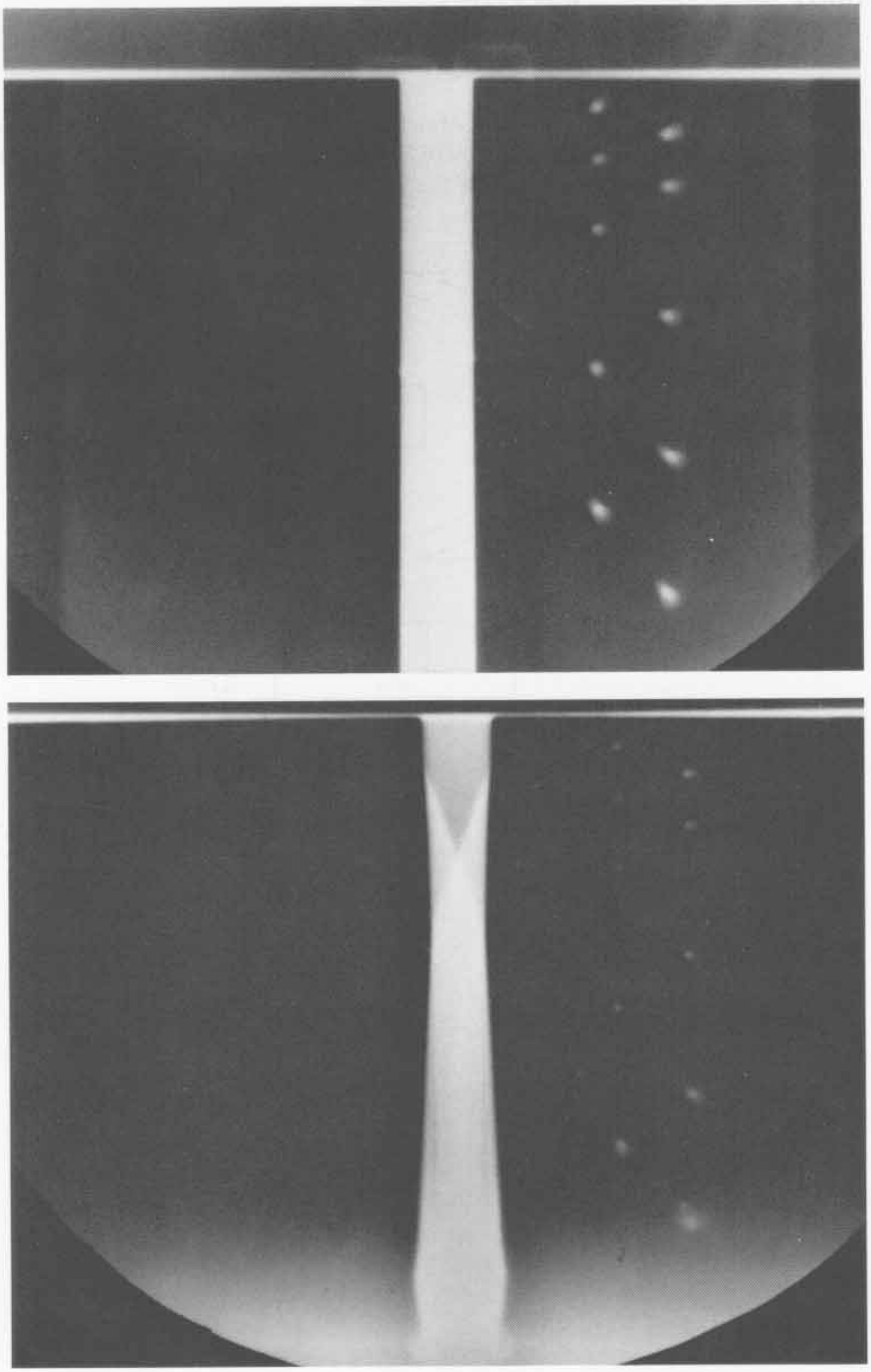


SHOT 1489: **Lead Regular Shock Reflection**
Date: June 26, 1973
Experimenter: Timothy R. Neal
Radiographic Time: 36.29 μs
Reference: Neal, 1977

Two blocks of PBX-9404 simultaneously initiated by a P-081 lens obliquely shocked 14.0 mm of lead. The shocks interacted to form a regular shock reflection. See Shot 1488.

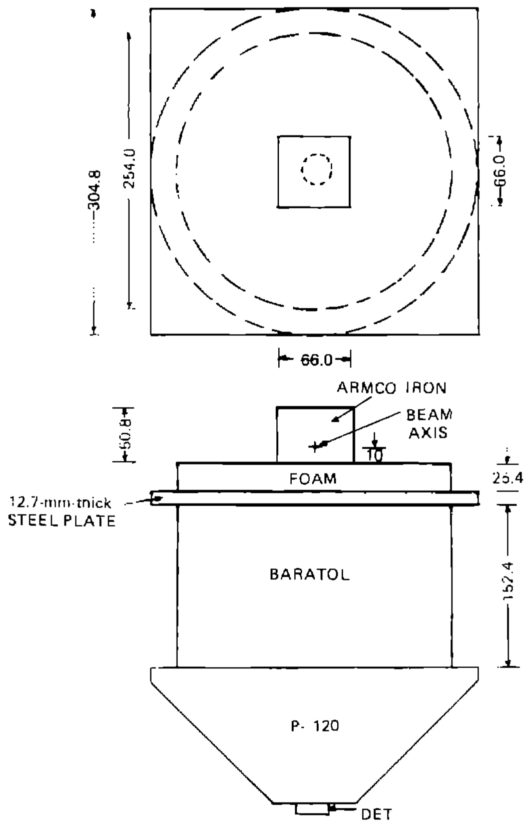


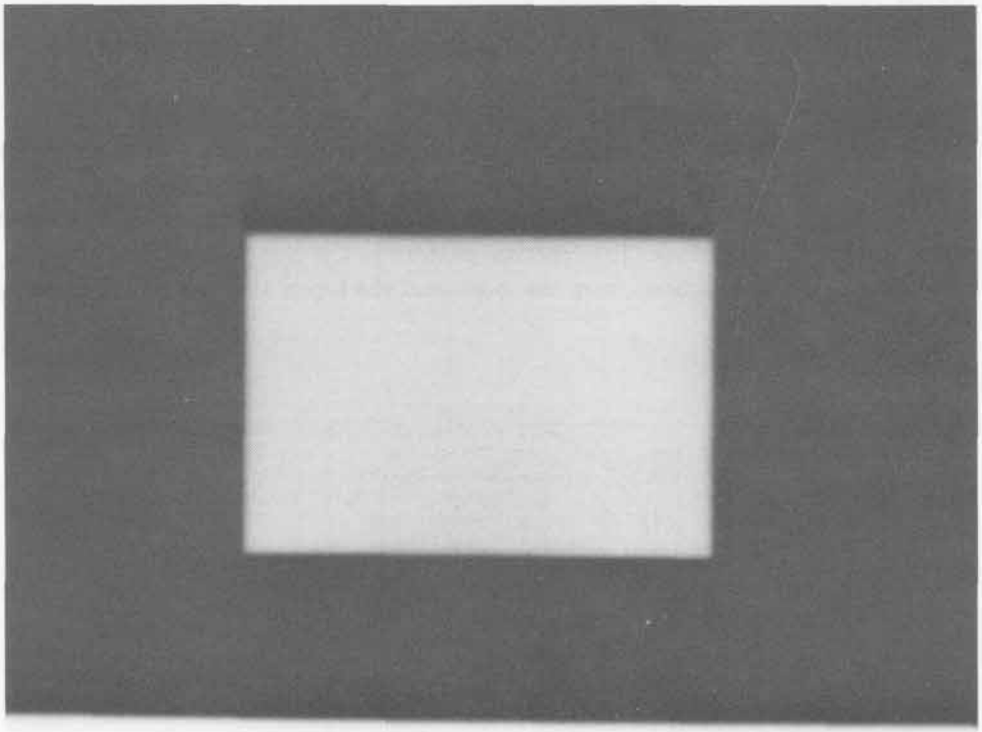


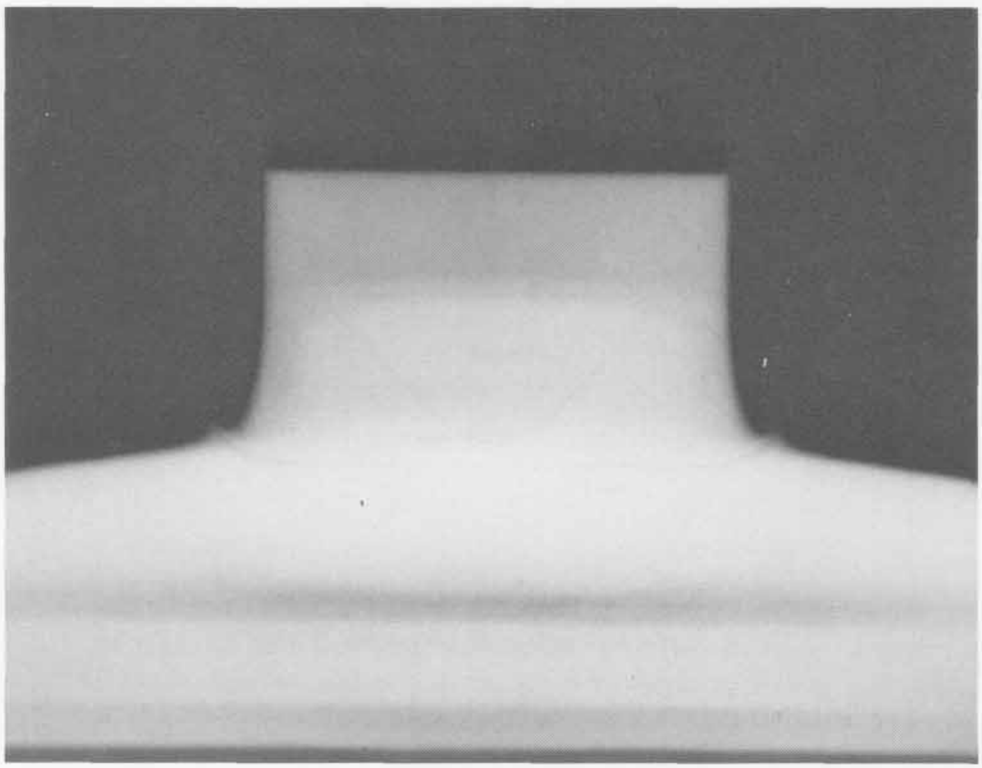


SHOT 1497:	**Iron Phase Change**
Date:	May 10, 1973
Experimenter:	Gary W. Rodenz
Radiographic Time:	90.28 μs

A 66.0- by 66.0- by 50.8-mm block of Armco iron was shocked by a 12.7-mm-thick stainless steel plate driven by 152.4 mm of Baratol and a P-120 lens. The two shock and rarefaction profiles resulted from the iron phase change.

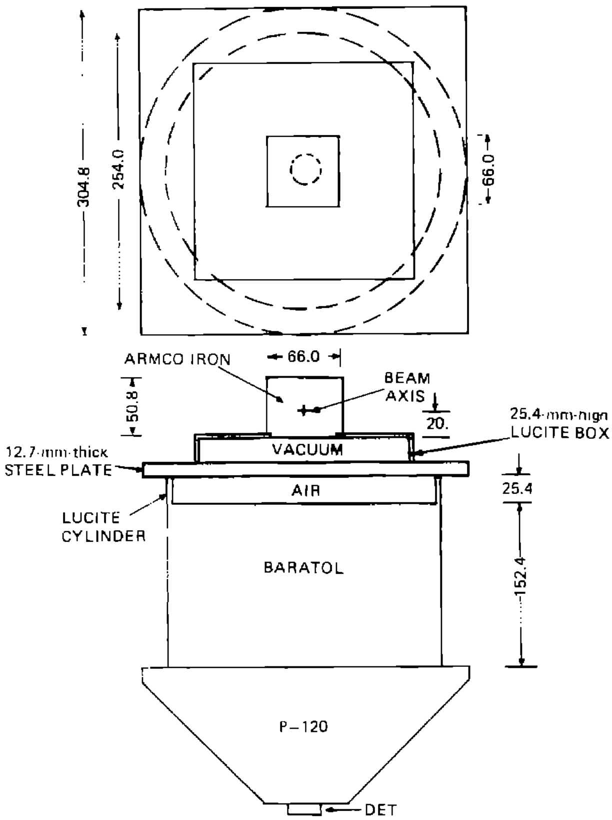


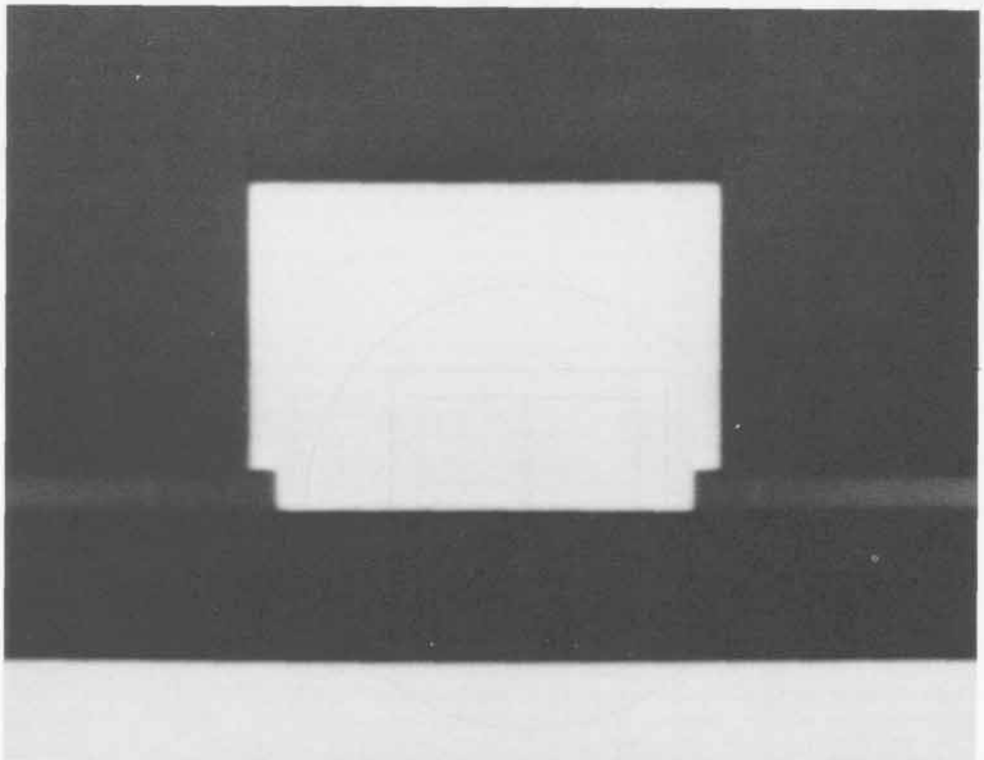


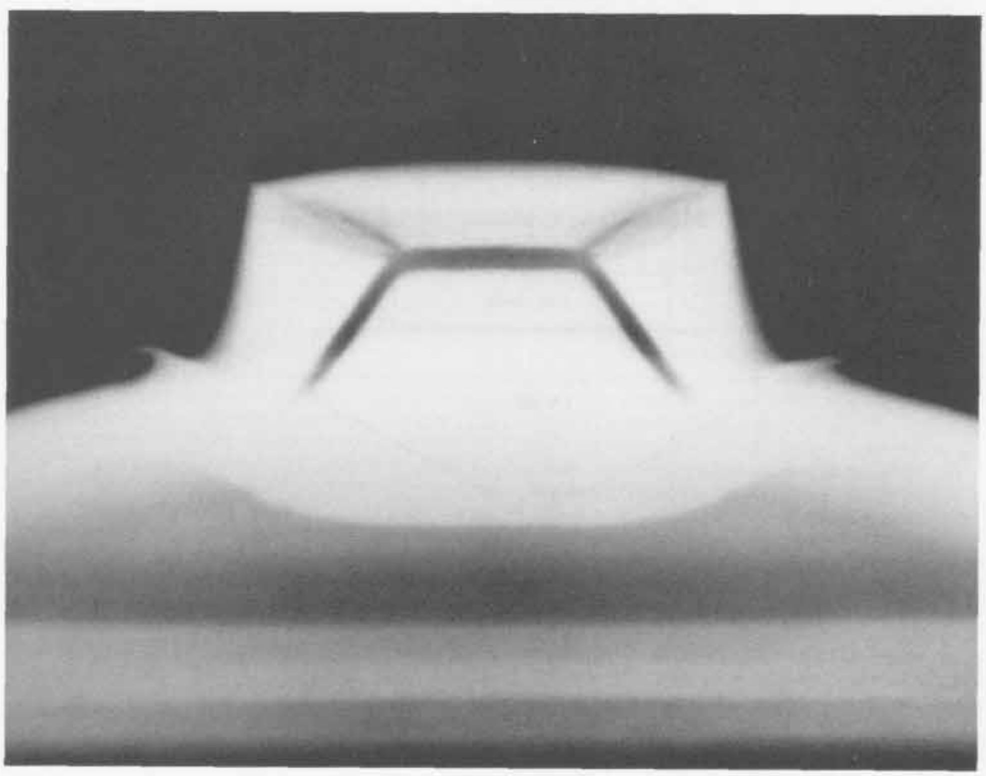


SHOT 1515: **Dynamic Fracture of Iron**
Date: August 1, 1973
Experimenter: Gary W. Rodenz
Radiographic Time: 114.58 μs

A 66.0- by 66.0- by 50.8-mm block of Armco iron was shocked by a 12.7-mm-thick steel plate driven by 152.4 mm of Baratol and a P-120 lens with a 25.4-mm air gap between the Baratol and the steel plate. The steel plate traveled 25.4 mm before it collided with the iron block. The fracture pattern in the iron was a result of the interactions of the rarefactions from the sides and the top of the iron block. See also Shot 1627.

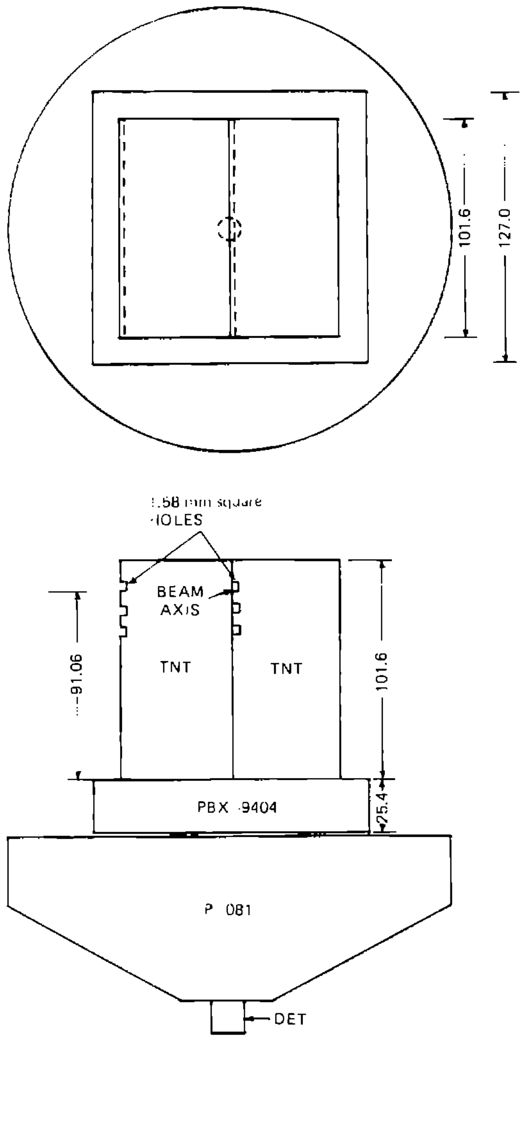


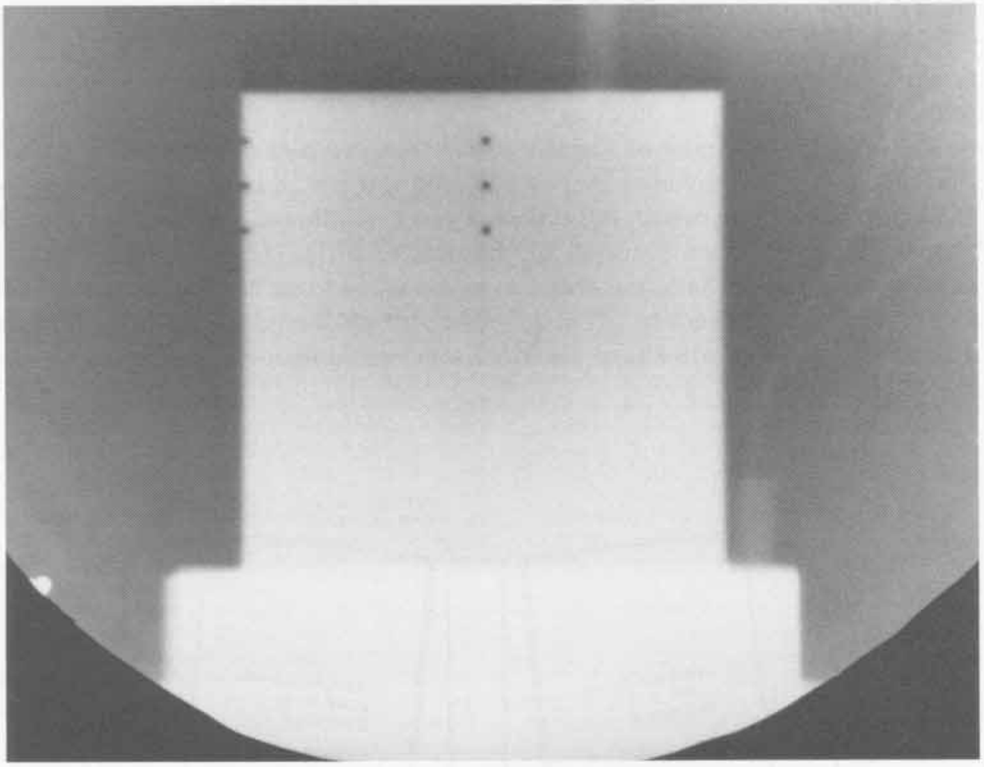


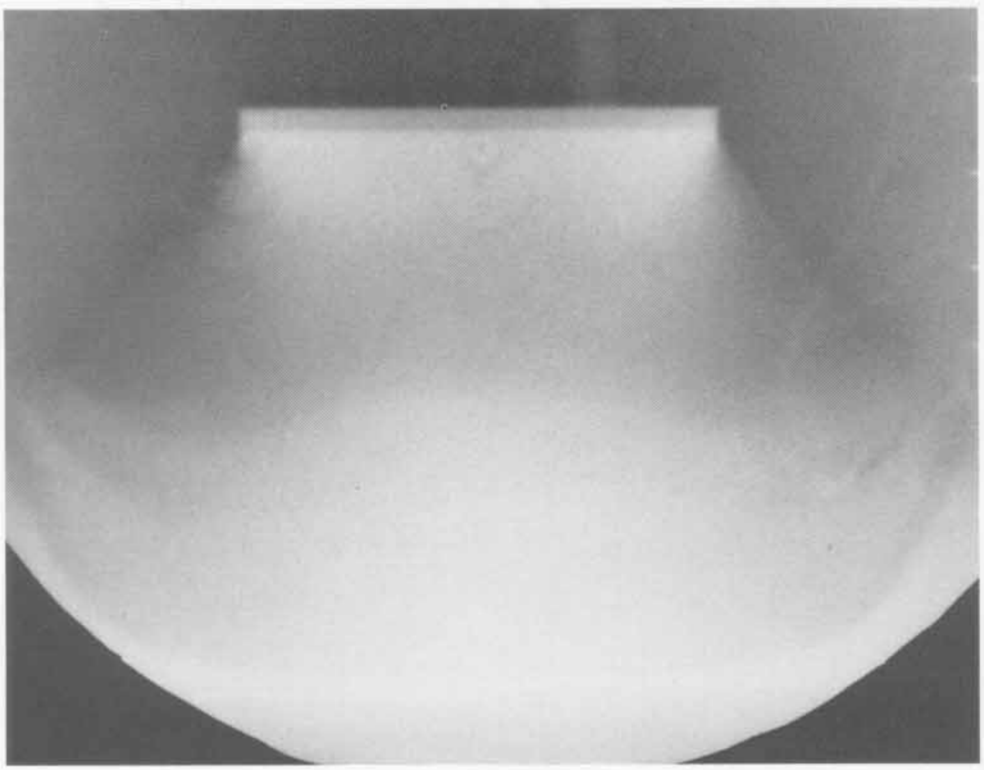


SHOT 1519: **Perturbation Waves in TNT**
Date: June 14, 1973
Experimenter: William C. Davis
Radiographic Time: 39.34 μs

Two 50.8-mm-wide by 101.6-mm-high blocks of TNT with 1.5875-mm-square holes were initiated by 25.4 mm of PBX-9404 and a P-081 lens.

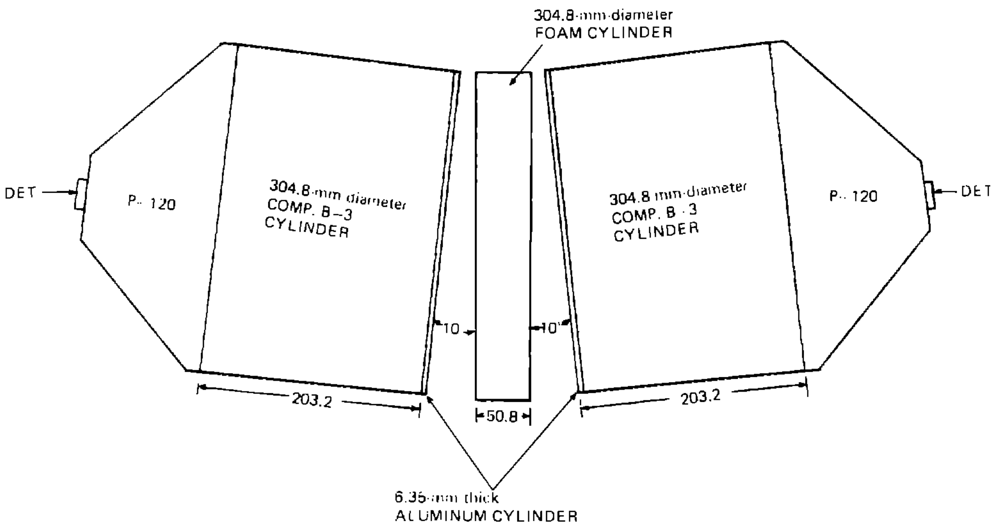


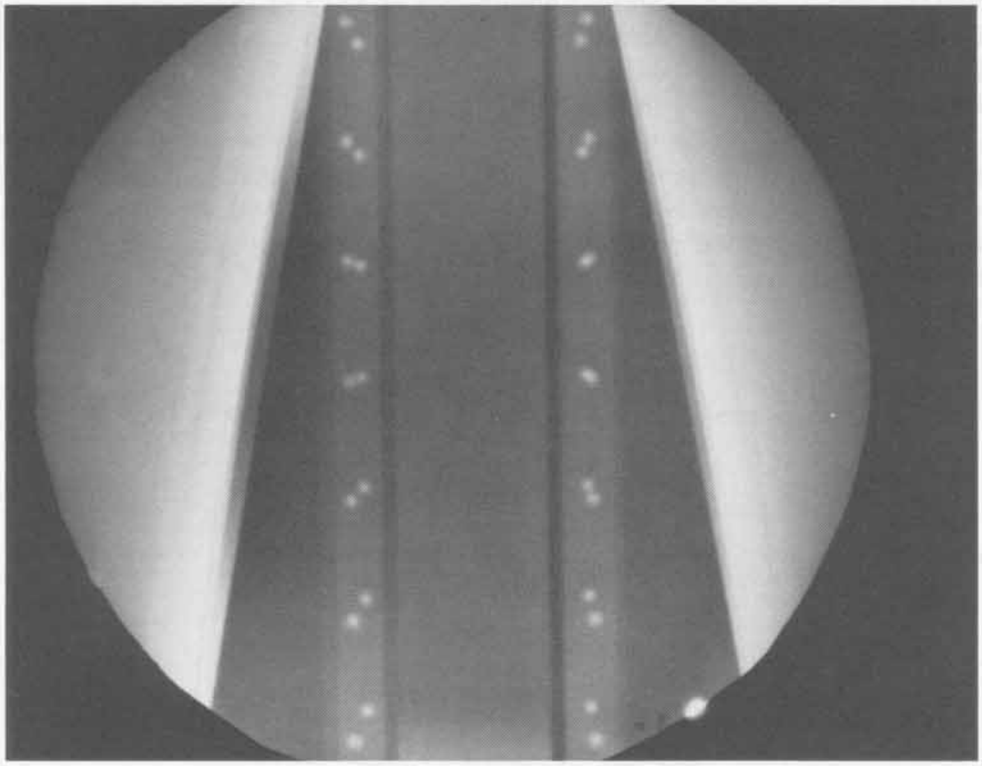


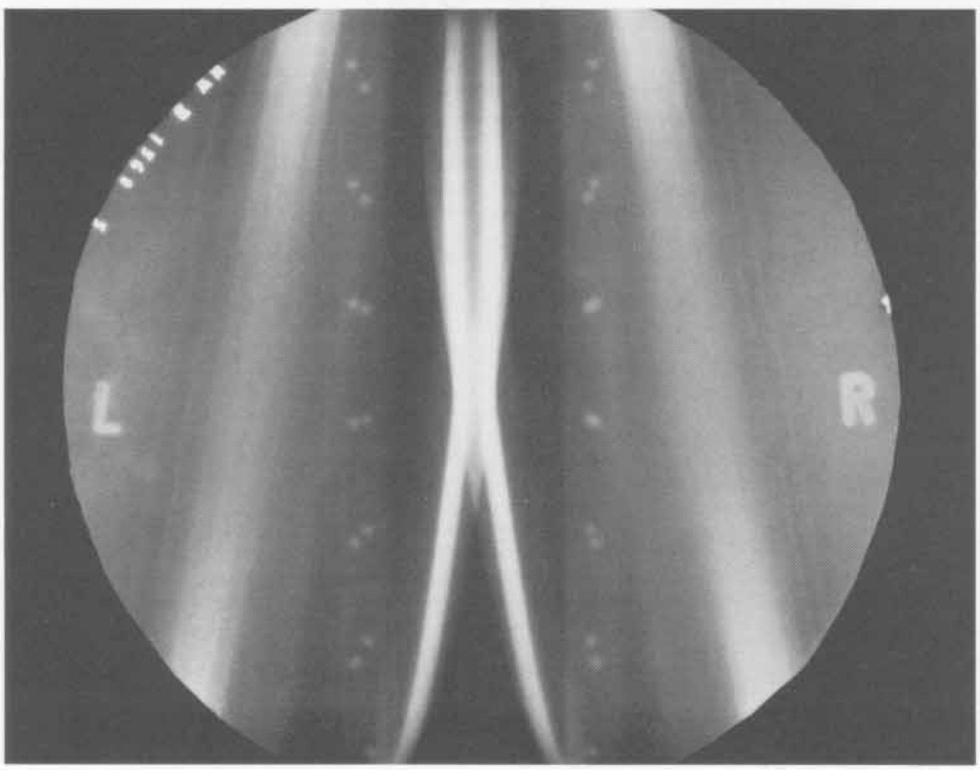


SHOT 1568: **Shock Compression of Foamed Polystyrene**
Date: February 11, 1975
Experimenter: John W. Taylor
Radiographic Time: 73.47 μs

A 50.8-mm-thick cylinder of foamed polystyrene (average density of 0.25 g/cm^3) was symmetrically impacted by two 6.35-mm-thick aluminum plates driven by 203.2-mm-thick Composition B-3 cylinders and P-120 lenses. See also Shot 1569. A regular shock reflection occurred in the decomposition products of the shock-heated polystyrene. The initial shock compresses the foam to 1.0 g/cm^3 and about 59 kbars, the second shock to 1.71 g/cm^3 and about 496 kbars, and the third shock to 2.12 g/cm^3 and about 819 kbars. The final compressed foam density was 2.8 g/cm^3 and about 1 Mbar.

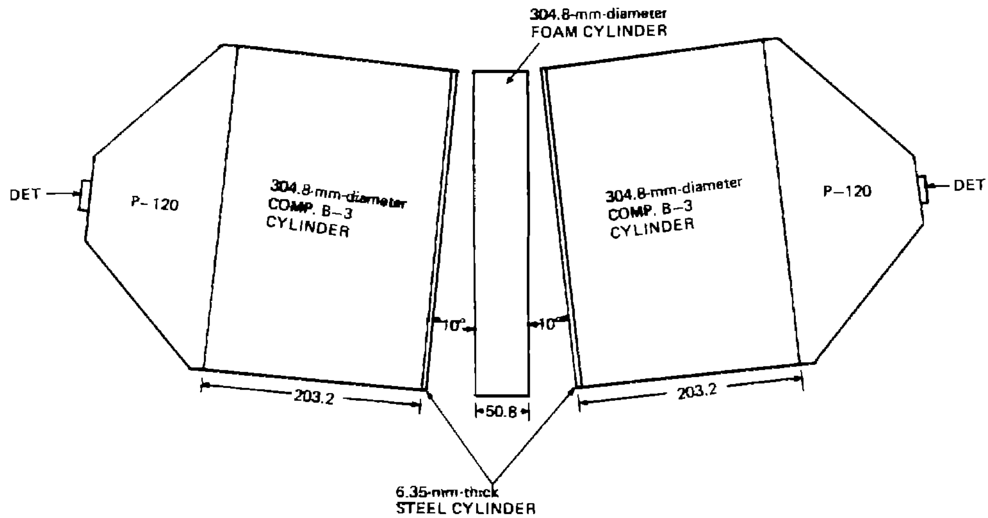


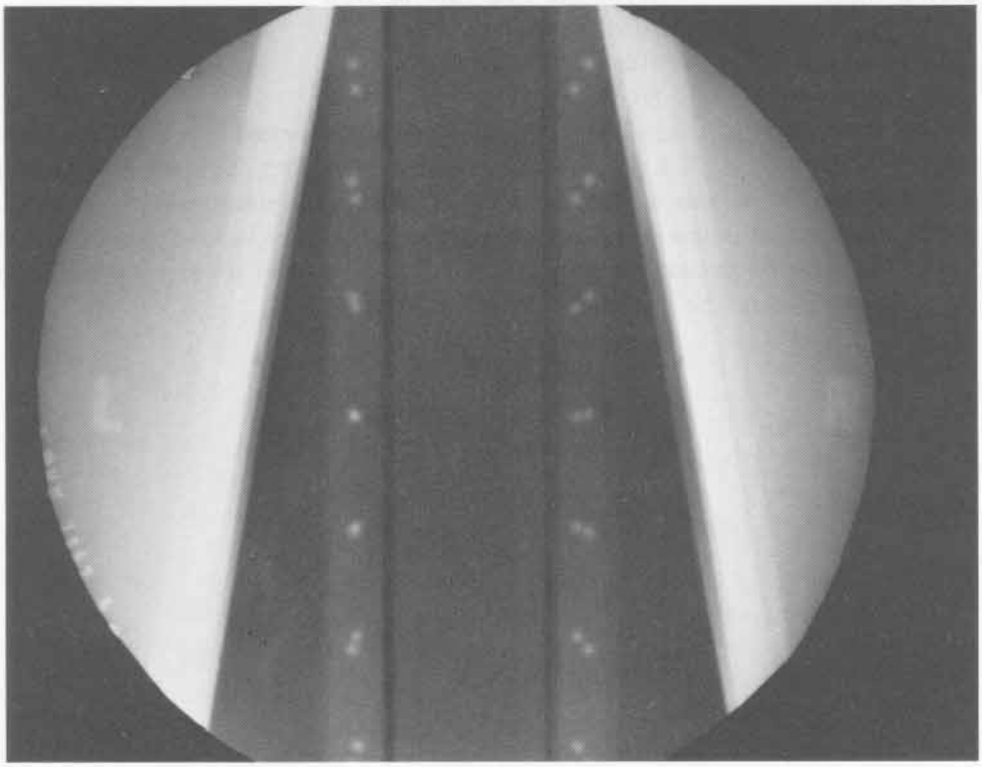



L
R

SHOT 1569: **Shock Compression of Foamed Polystyrene**
Date: March 26, 1975
Experimenter: John W. Taylor
Radiographic Time: 78.70 μs

A 50.8-mm-thick cylinder of foamed polystyrene (average density of 0.25 g/cm^3) was symmetrically impacted by two 6.35-mm-thick steel plates driven by 203.2-mm-thick Composition B-3 cylinders and P-120 lenses. See also Shot 1568. A regular shock reflection occurred in the decomposition products of the shocked heated polystyrene.

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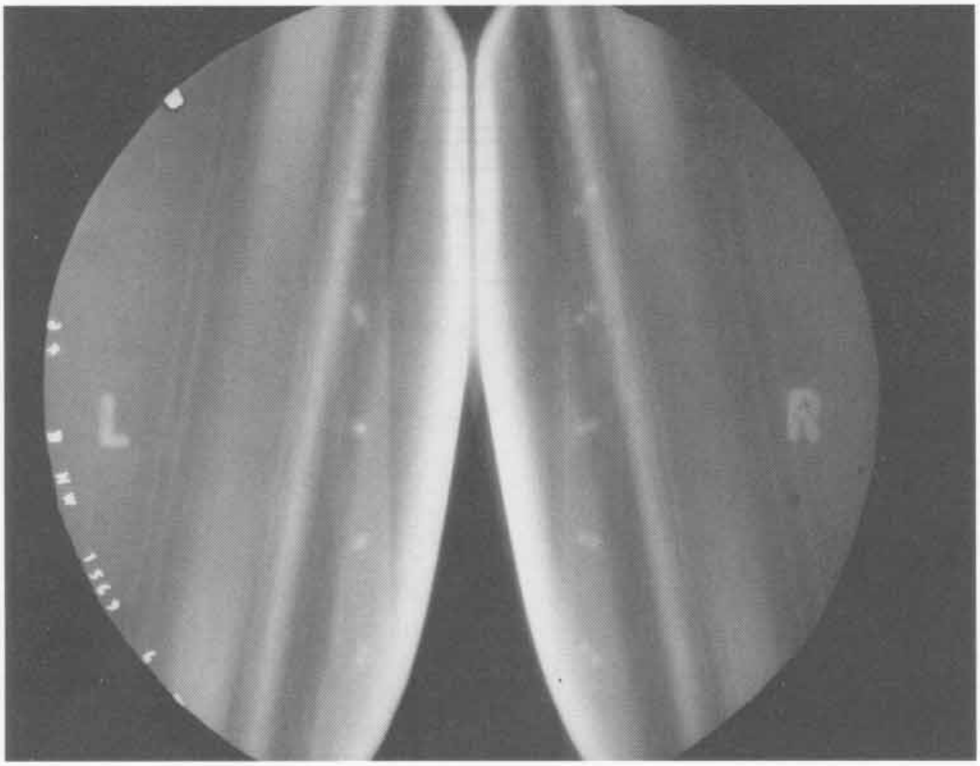
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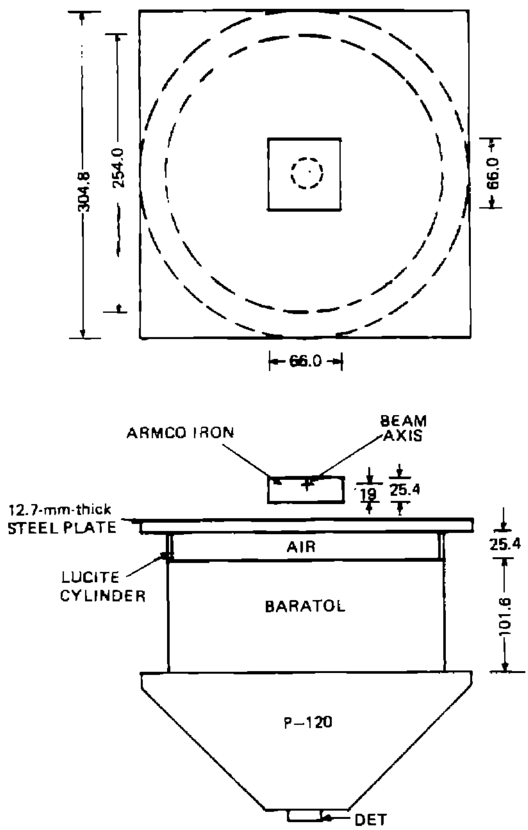
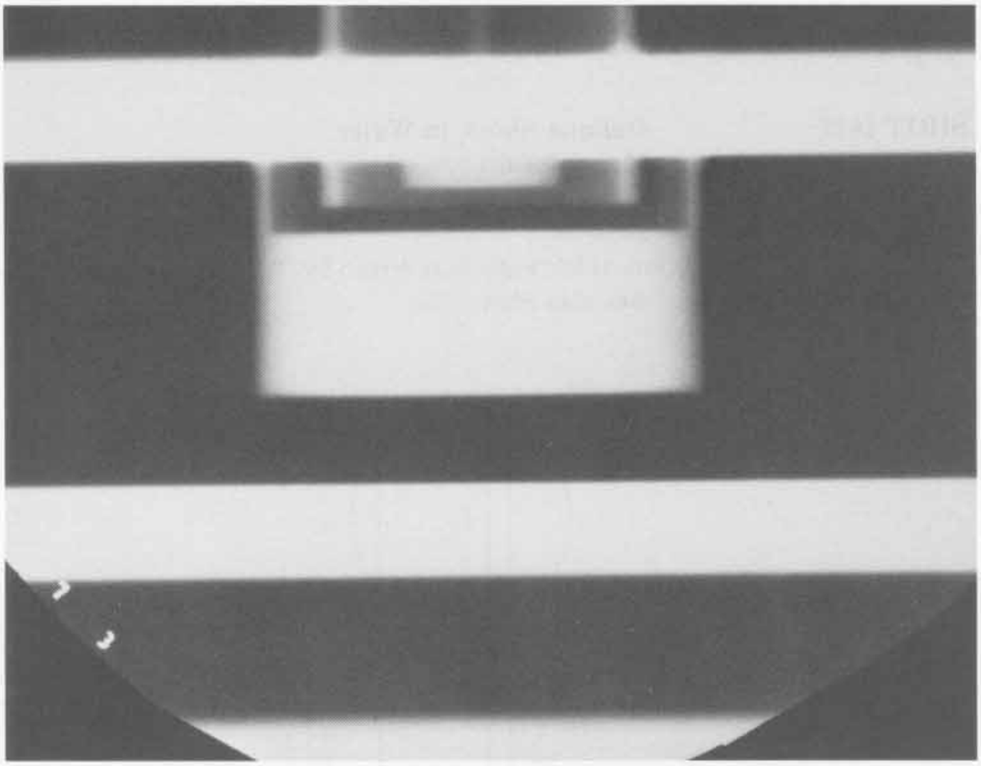
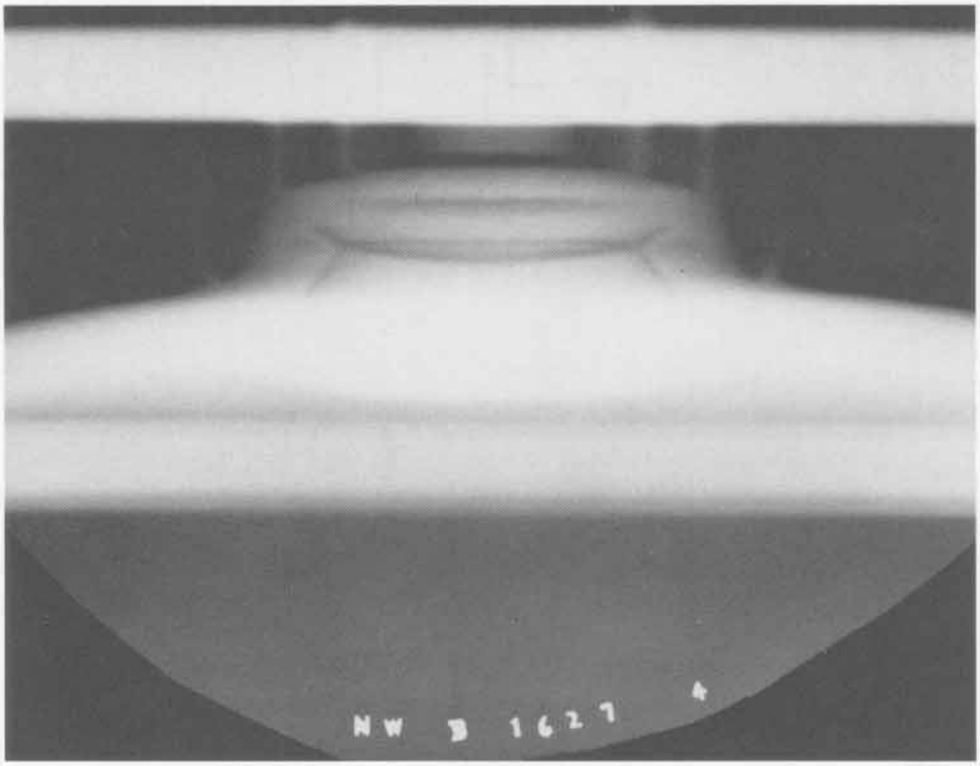
SHOT 1627: **Dynamic Fracture of Iron**
Date: April 8, 1975
Experimenter: Gary W. Rodenz
Radiographic Time: 86.60 μs

A 66.0- by 66.0- by 25.4-mm block of Armco iron was shocked by a 12.7-mm-thick steel plate driven by 101.6 mm of Baratol and a P-120 lens. Between the Baratol and the steel plate was a 25.4-mm air gap. The steel plate traveled 14.2 mm before it collided with the iron block. A capacitor gauge was located above the iron block. The fracture pattern was a result of the interaction of the rarefactions from the sides and top of the iron block. See also Shot 1515.







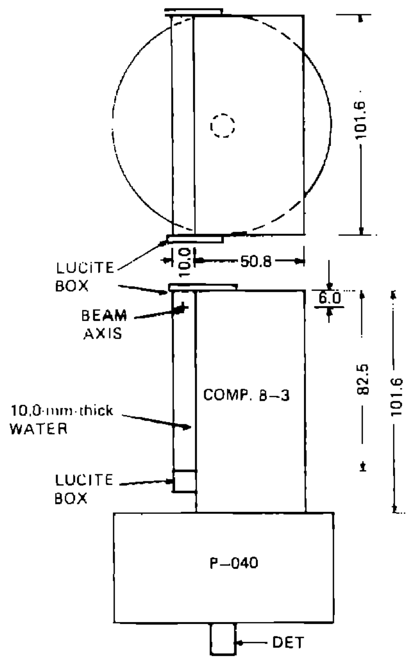
SHOT 1629: **Oblique Shock in Water**

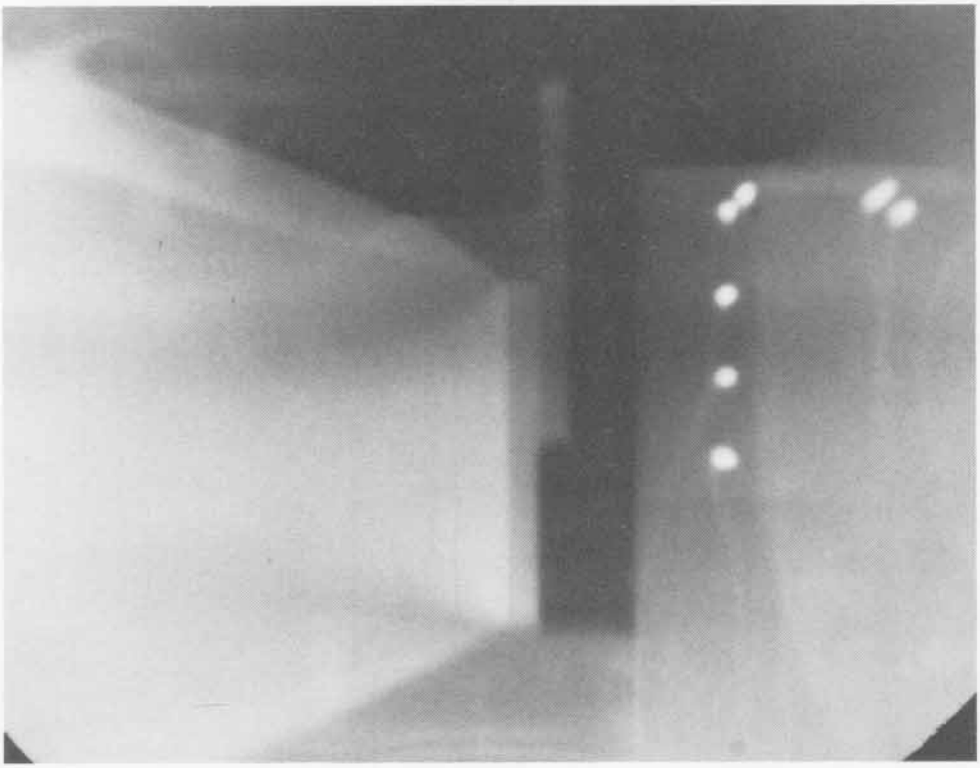
Date: May 6, 1976

Experimenter: Timothy R. Neal

Radiographic Time: 25.90 μs

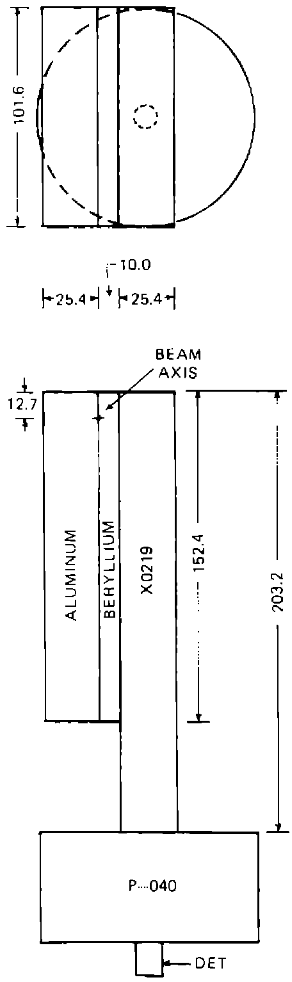
An oblique shock in 10.0-mm-thick water was driven by 50.8-mm Composition B-3 initiated by a P-040 lens. See also Shot 1739.

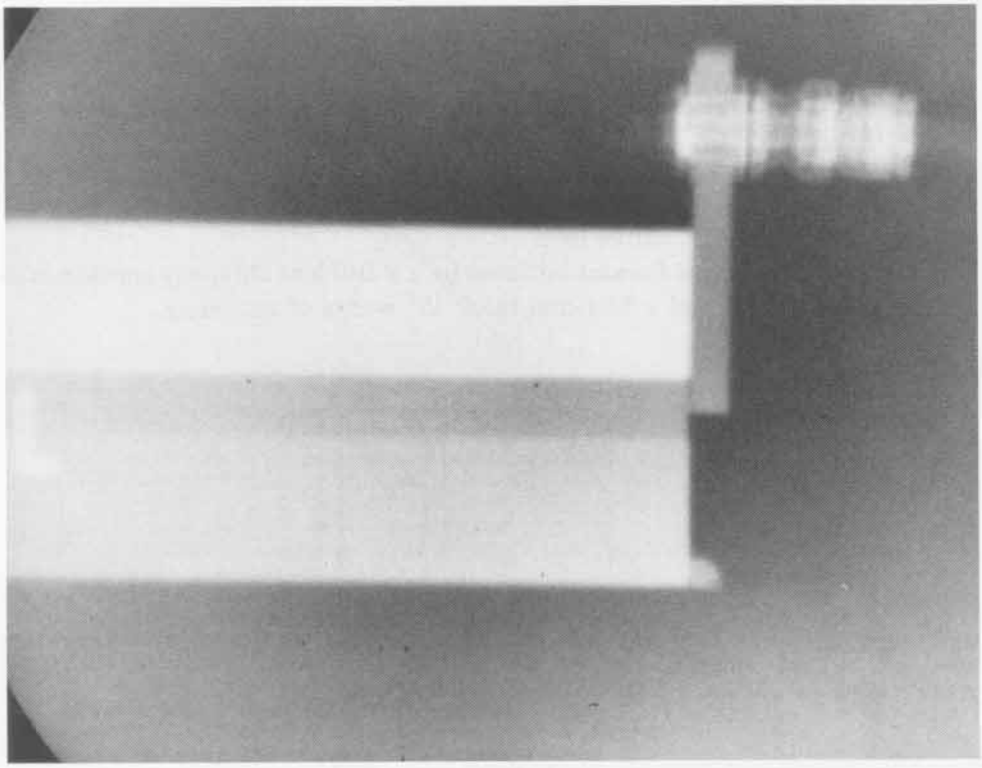


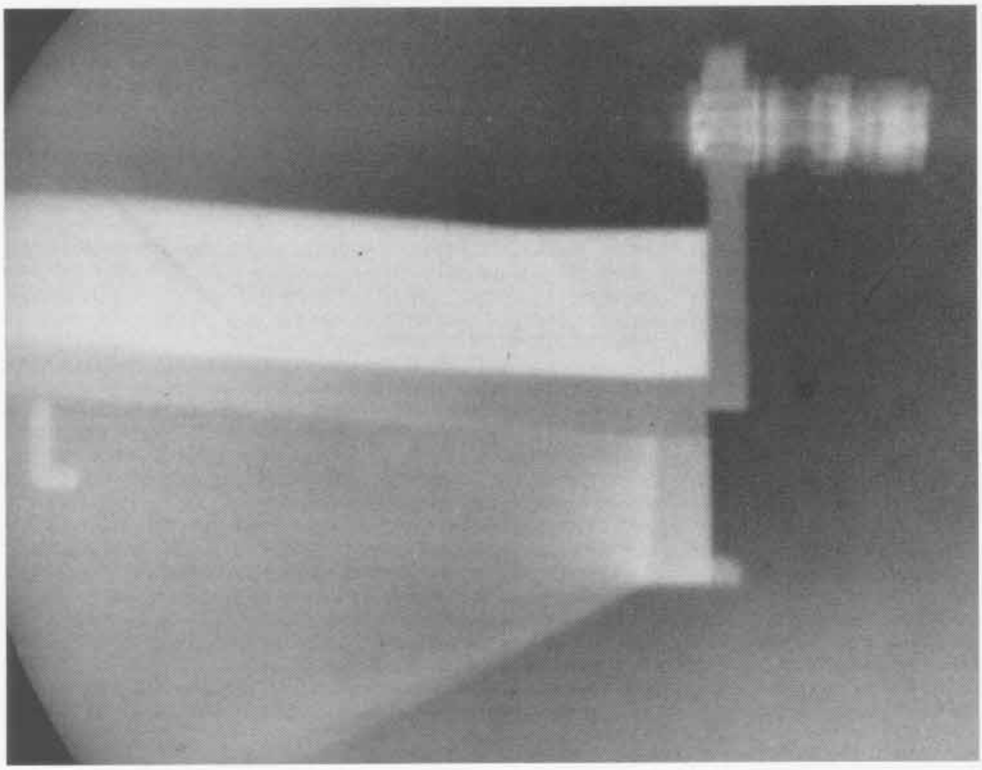


SHOT 1634:	**Oblique Shocks in Composite Systems**
Date:	June 11, 1975
Experimenter:	Timothy R. Neal
Radiographic Time:	39.1 μs

A 25.4-mm-wide block of X0219 (90/10 wt% TATB/Kel-F at 1.914 g/cm³) was initiated by a P-040 lens and obliquely shocked 10-mm-thick beryllium and 25.4-mm-thick aluminum.

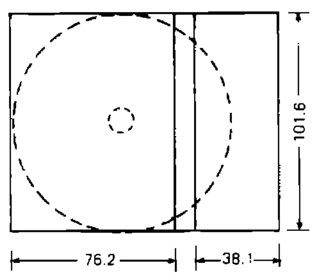


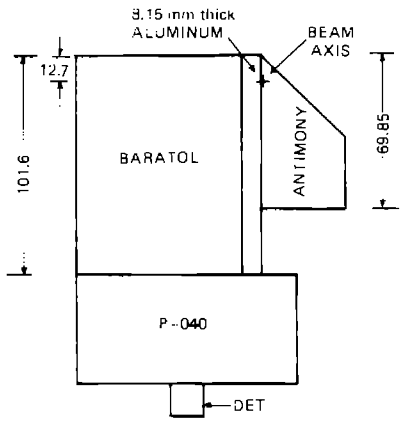


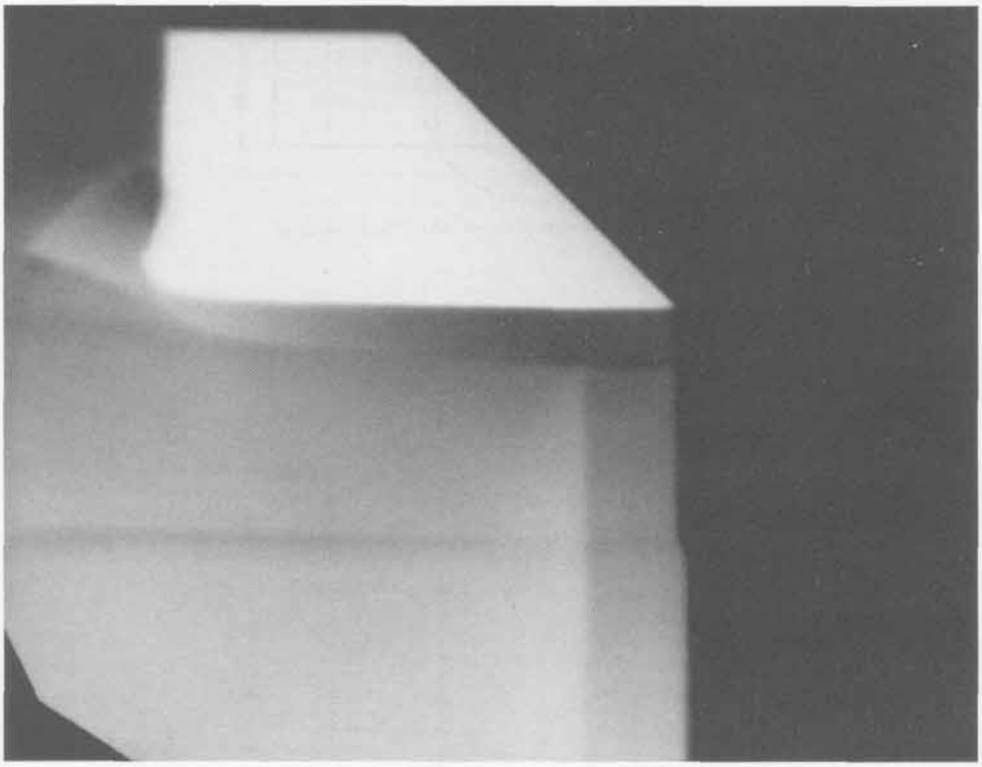


SHOT 1660: **Oblique Shocks in Composite Systems**
Date: November 13, 1975
Experimenter: Timothy R. Neal
Radiographic Time: 31.96 μs

A 76.2-mm-wide block of Baratol initiated by a P-040 lens obliquely shocked 8.15-mm-thick aluminum and a 38.1-mm-thick 45° wedge of antimony.

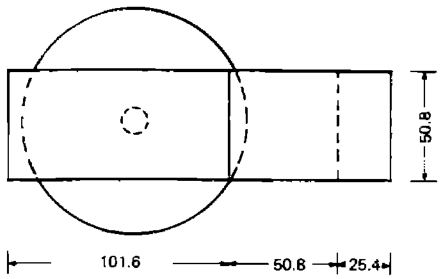


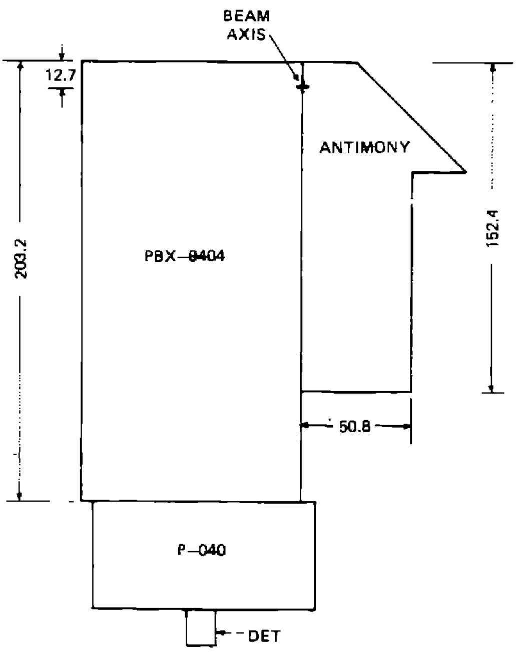


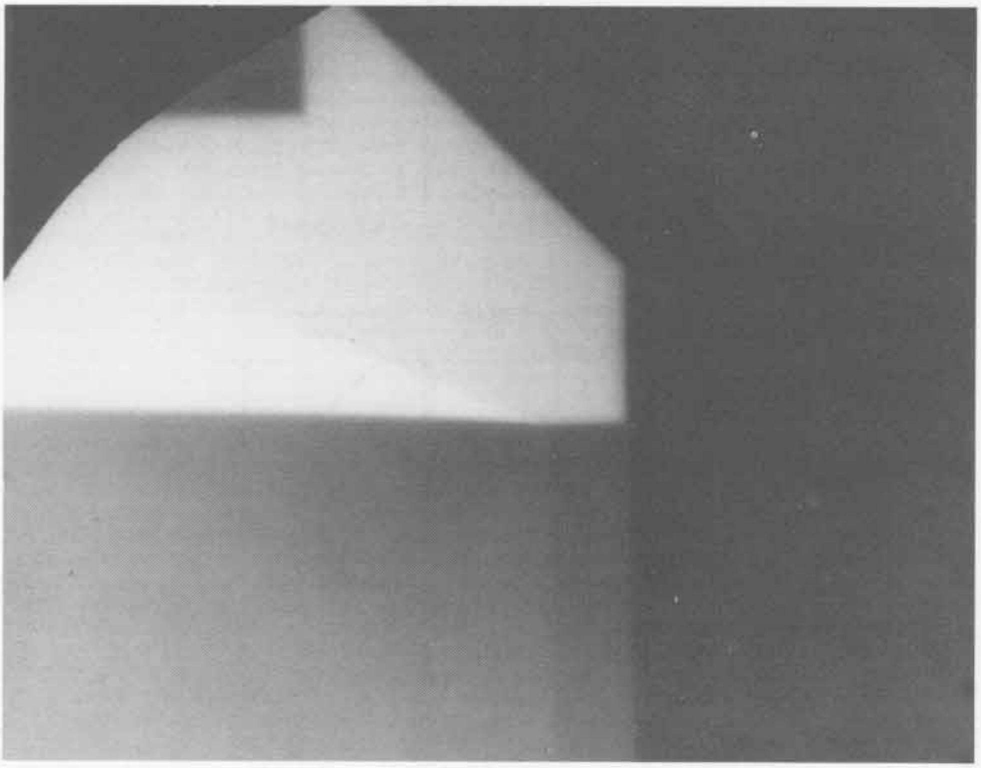


SHOT 1678: **Oblique Shock in Antimony**
Date: December 12, 1975
Experimenter: Timothy R. Neal
Radiographic Time: 35.29 μs
Reference: Neal, 1976b

A 203.2-mm-high block of PBX-9404 was initiated by a P-040 lens and obliquely shocked a 50.8-mm-thick slab of antimony.

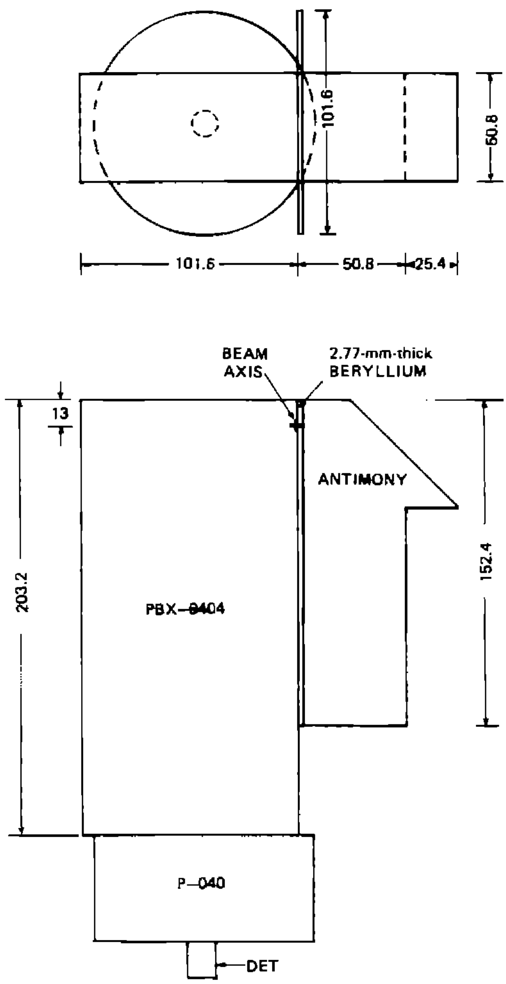


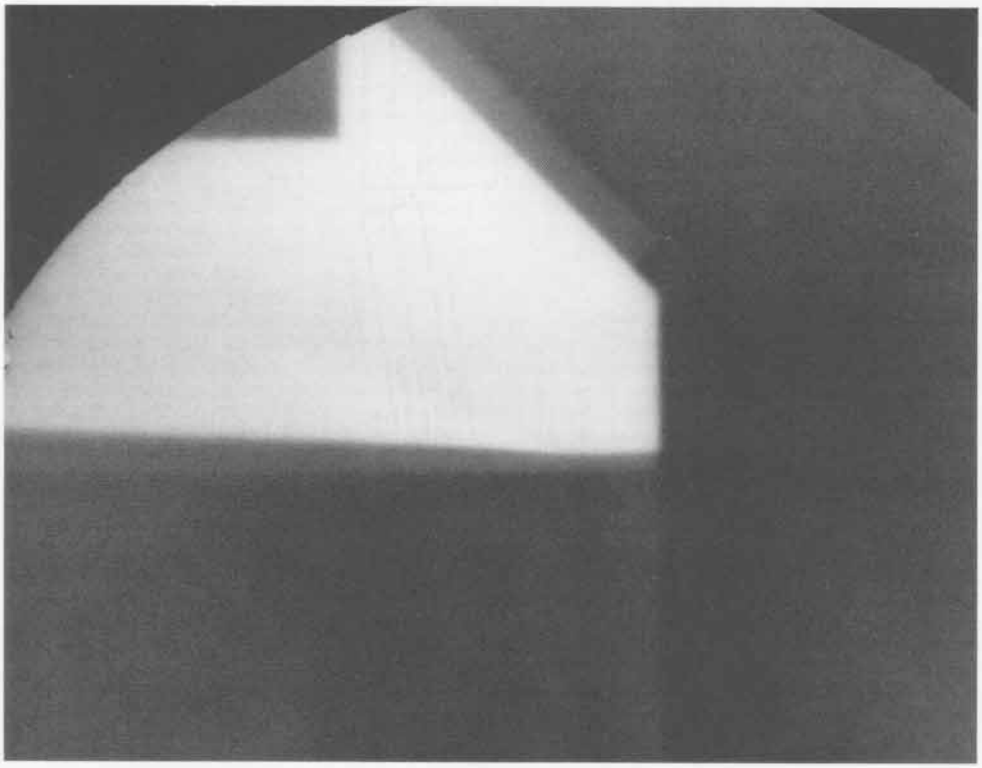




SHOT 1679: **Oblique Shocks in Composite Systems**
Date: December 18, 1975
Experimenter: Timothy R. Neal
Radiographic Time: 35.24 μs
Reference: Neal, 1976b

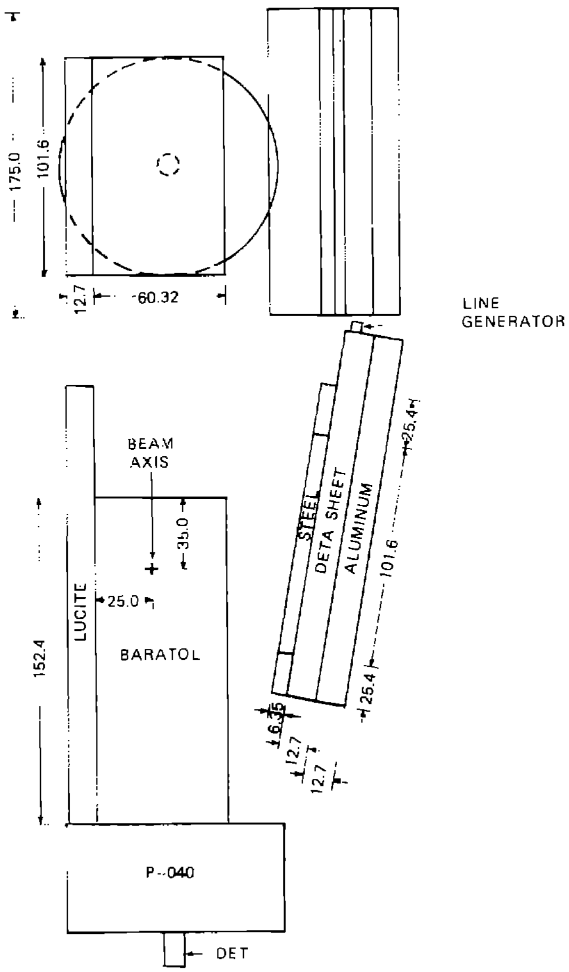
A 203.2-mm-high block of PBX-9404 was initiated by a P-040 lens and obliquely shocked 2.77-mm-thick beryllium and a 50.8-mm-thick slab of antimony.

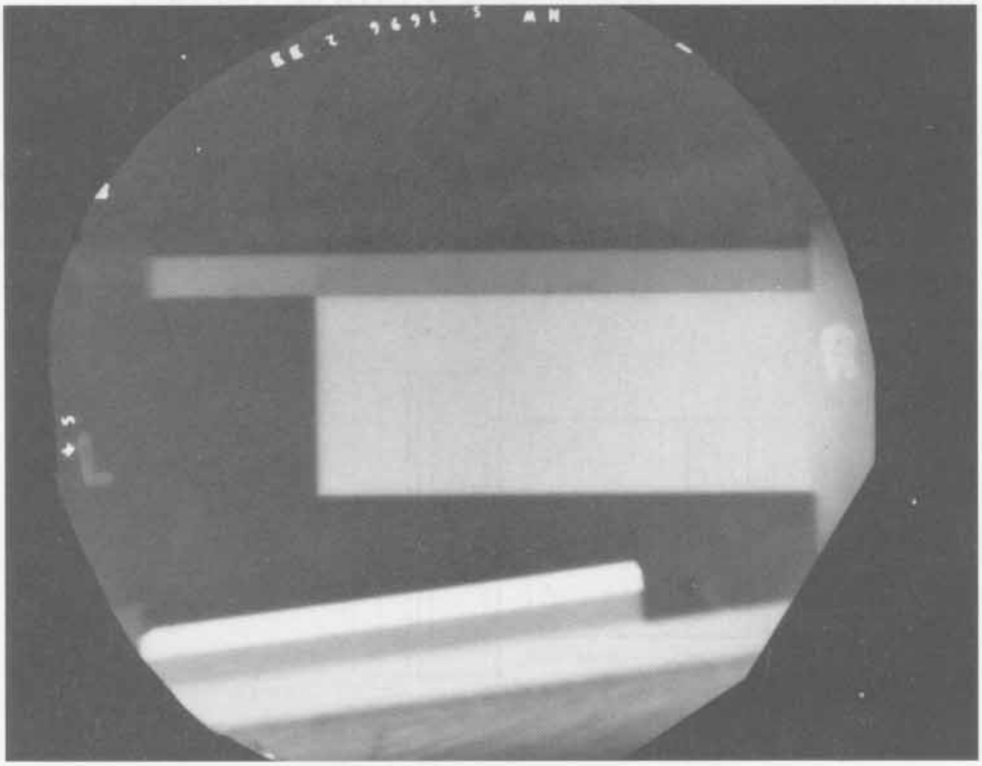




SHOT 1696: **Baratol Mach Reflection**
Date: December 15, 1976
Experimenter: Richard D. Dick
Radiographic Time: 87.7 μs
Reference: Mader and Dick, 1979

Baratol was shocked by a 6.35-mm-thick steel flying plate going 0.8 mm/μs and initiated by a P-040 lens after a delay of 50.51 μs. The resulting detonations interacted to form a Mach reflection.

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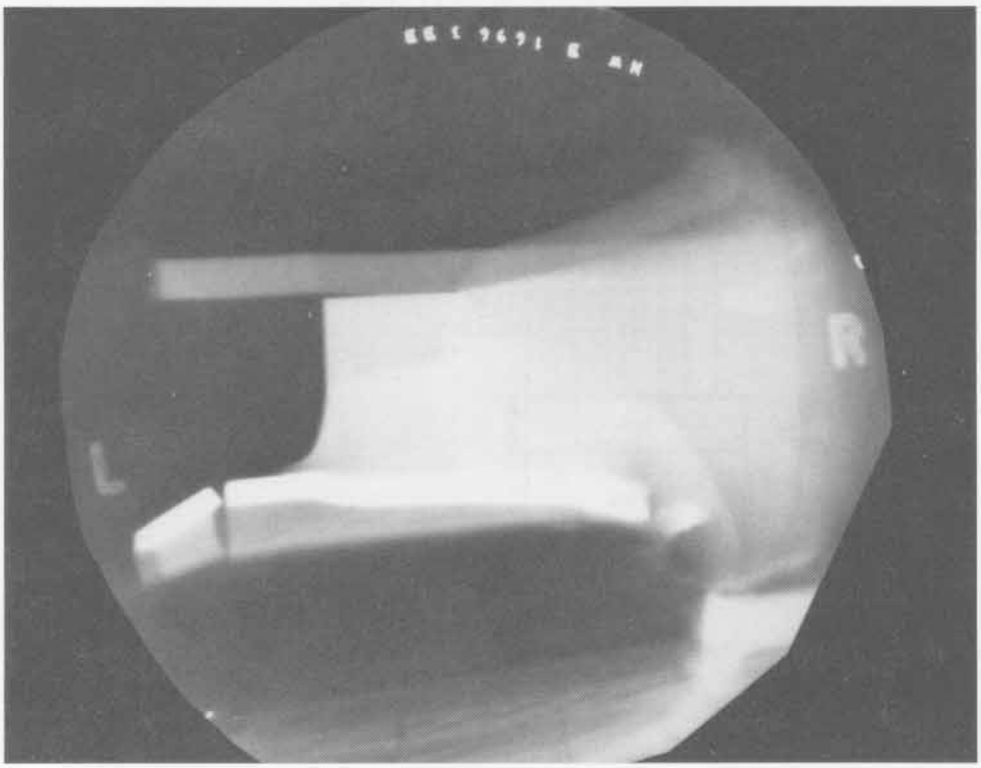
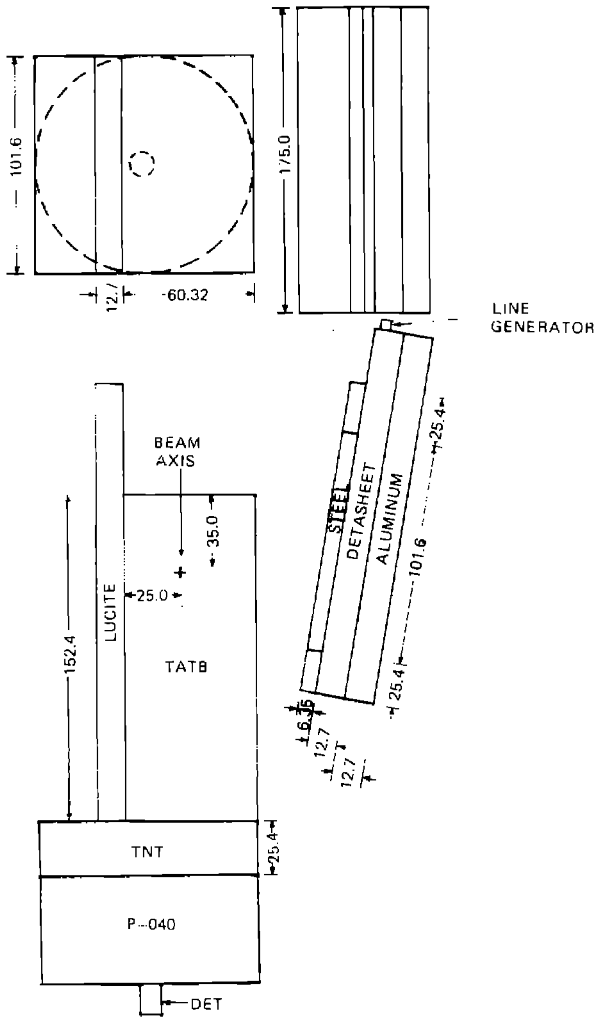
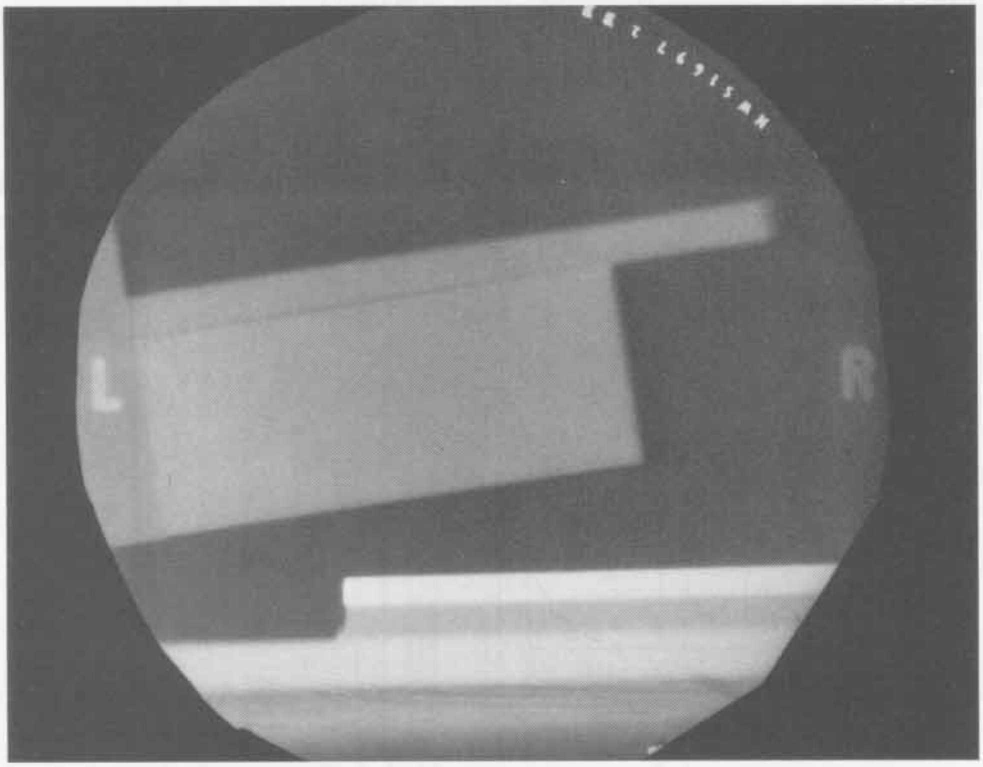
R

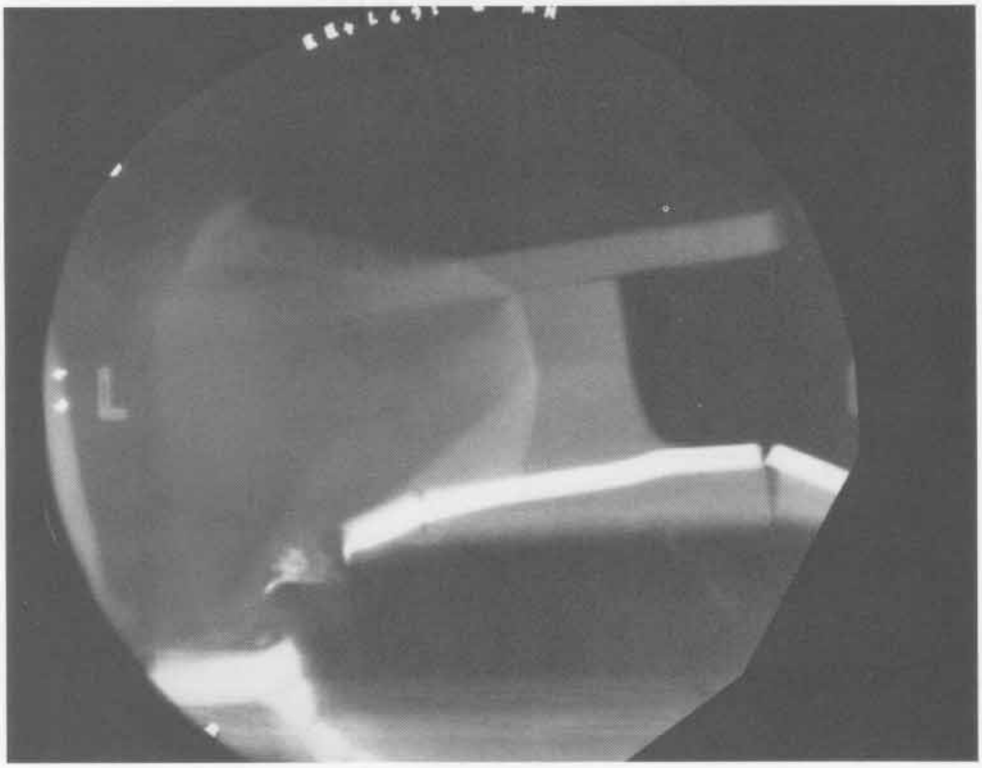

L
R

SHOT 1697: **Desensitization of TATB by Preshocking**
Date: January 6, 1977
Experimenter: Richard D. Dick
Radiographic Time: 86.11 μs
Reference: Mader and Dick, 1979

X0219 (90/10 wt% TATB/Kel-F at 1.914 g/cm^3) was shocked by a 6.35-mm-thick steel flying plate going 0.8 mm/μs and initiated by 25.4 mm of TNT and a P-040 lens after a delay of 53.8 μs. The resulting detonation failed to propagate in the preshocked explosive.

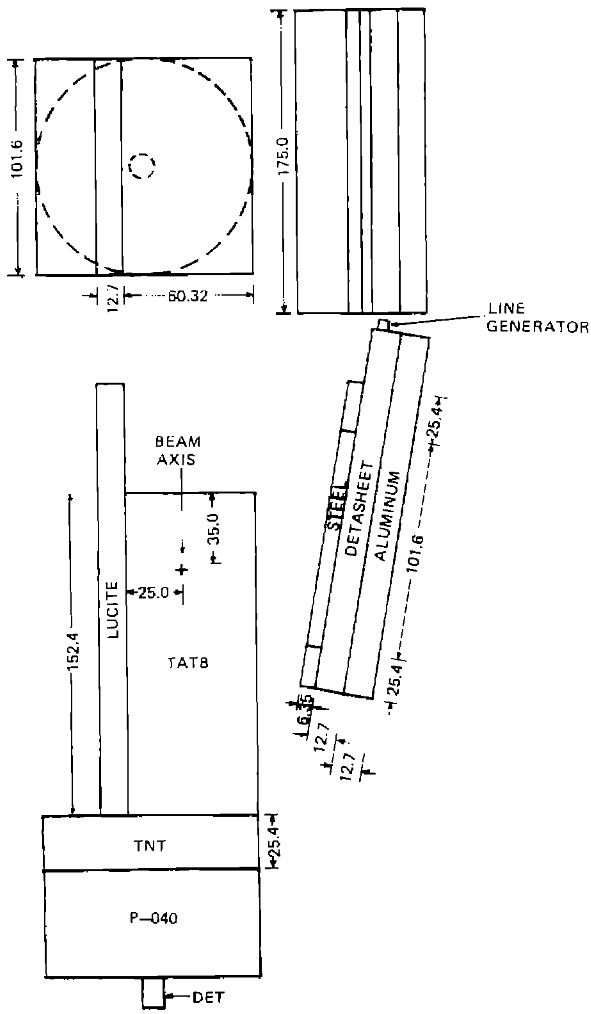


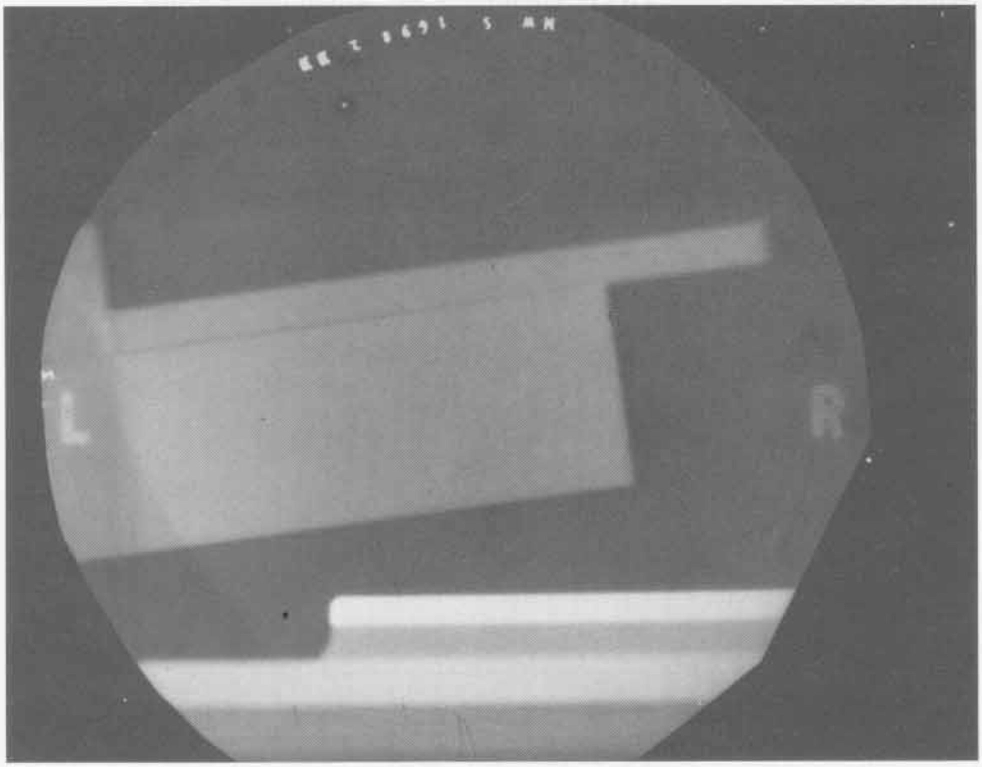




SHOT 1698: **Desensitization of TATB by Preshocking**
Date: January 6, 1977
Experimenter: Richard D. Dick
Radiographic Time: 86.12 μs
Reference: Mader and Dick, 1979

PBX-9502 (95/5 wt% TATB/Kel-F at 1.894 g/cm^3) was shocked by a 6.35-mm-thick steel plate going 0.8 mm/μs and initiated by 25.4 mm of TNT and a P-040 lens after a delay of 53.58 μs. The resulting detonation failed to propagate in the preshocked explosive. See also Shot 1914.

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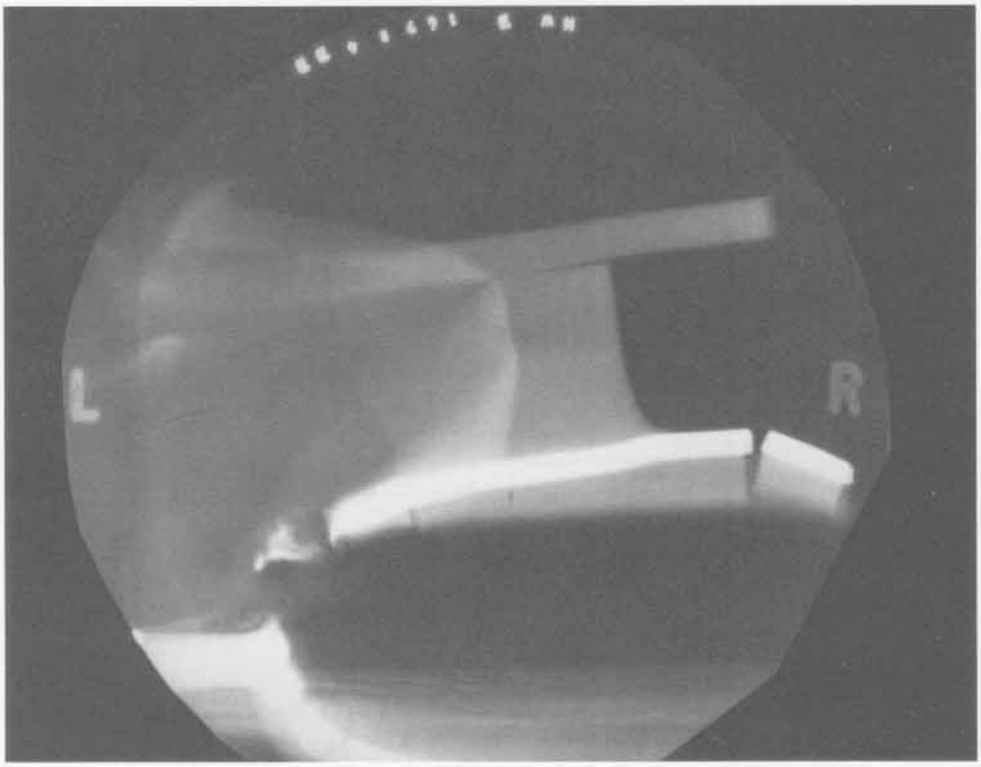
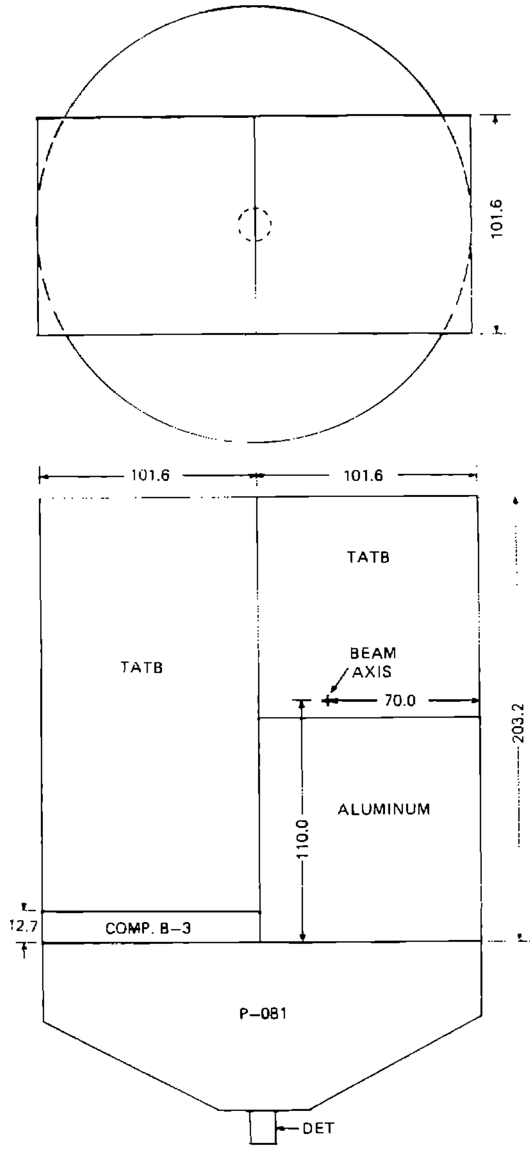
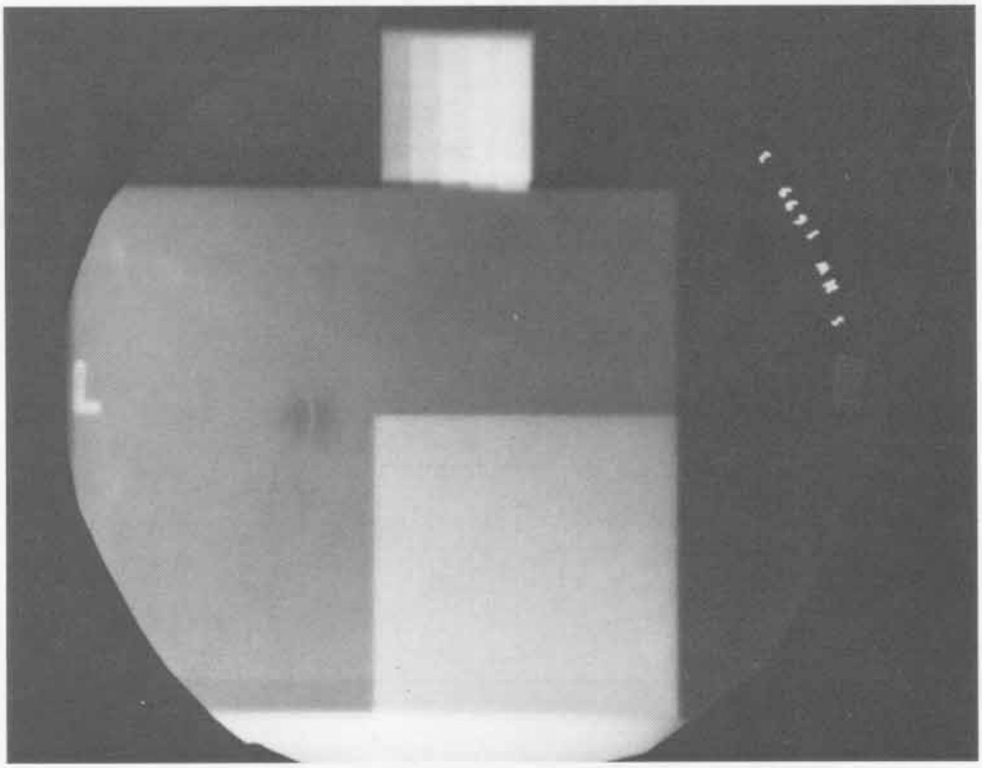

L
R

SHOT 1699: **TATB Turning a 90° Aluminum Corner**
Date: April 14, 1976
Experimenter: Richard D. Dick
Radiographic Time: 42.93 μs

An X0219 (90/10 wt% TATB/Kel-F at 1.914 g/cm³) detonation wave initiated by 12.7 mm of Composition B-3 and a P-081 lens turned an embedded aluminum corner. See also Shot 1745. A step wedge used for density calibration is shown on top of the shot.

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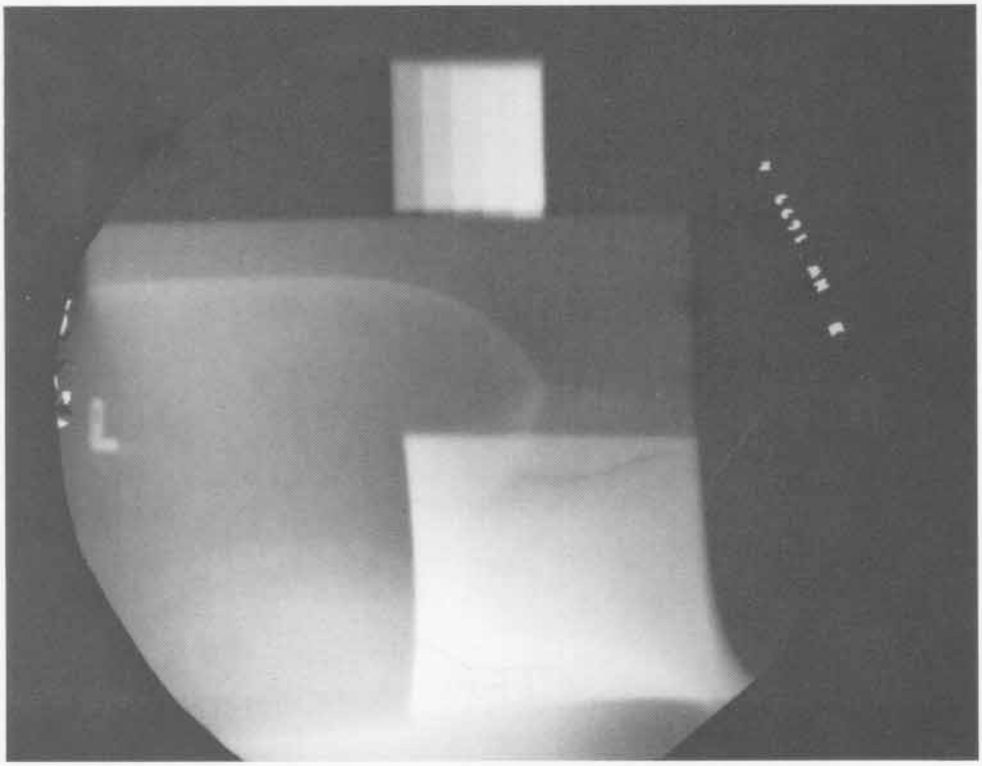
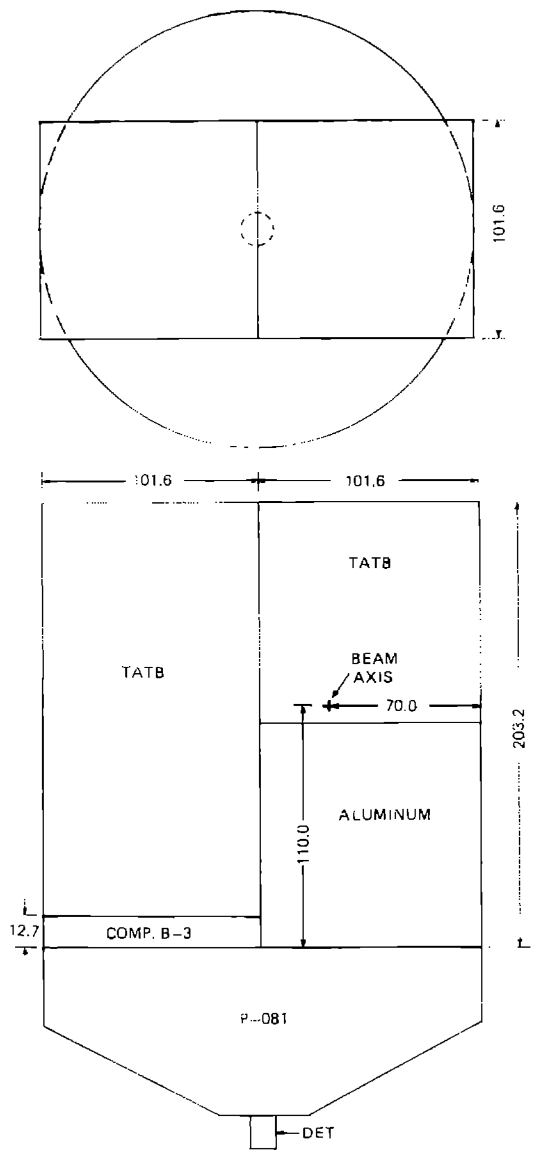
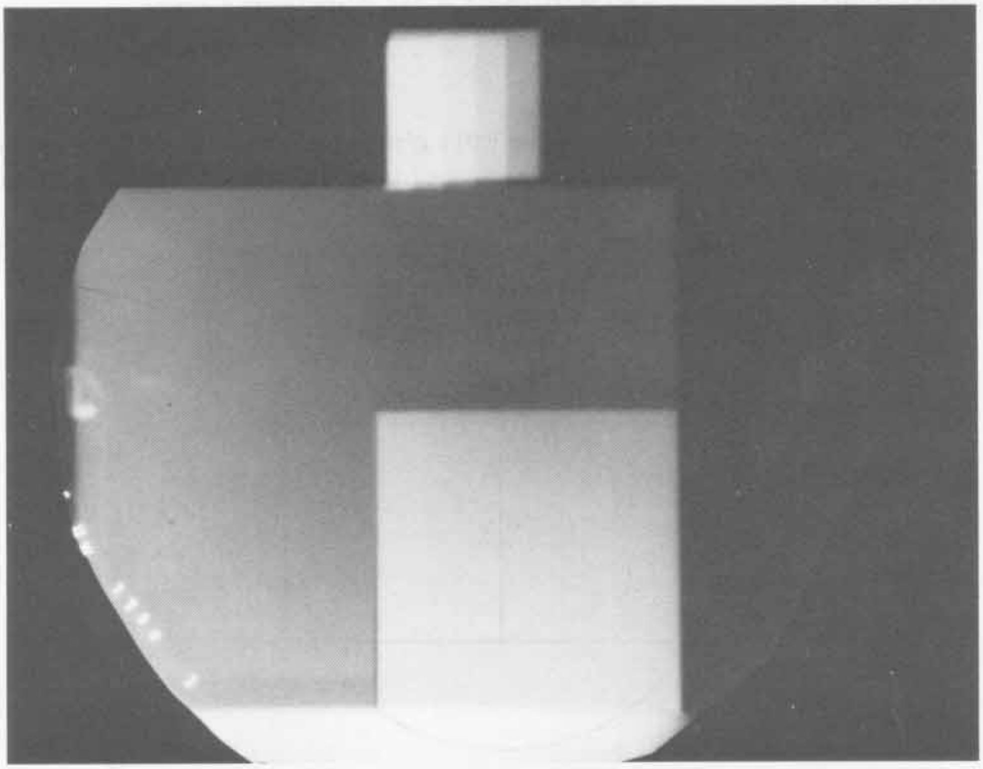
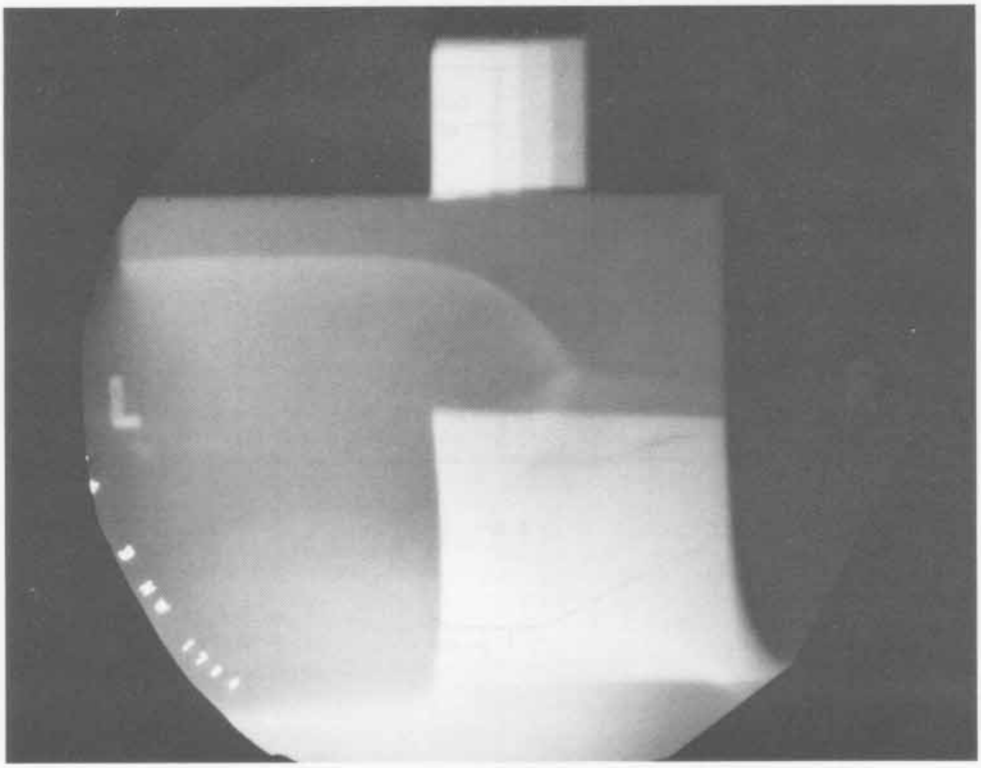

L

SHOT 1700: **TATB Turning a 90° Aluminum Corner**
Date: April 14, 1976
Experimenter: Richard D. Dick
Radiographic Time: 42.64 μs

A PBX-9502 (95/5 wt% TATB/Kel-F at 1.894 g/cm³) detonation wave initiated by 12.7 mm of Composition B-3 and a P-081 lens turned an embedded aluminum corner. See also Shot 1746. A step wedge used for density calibration is shown on top of the shot.







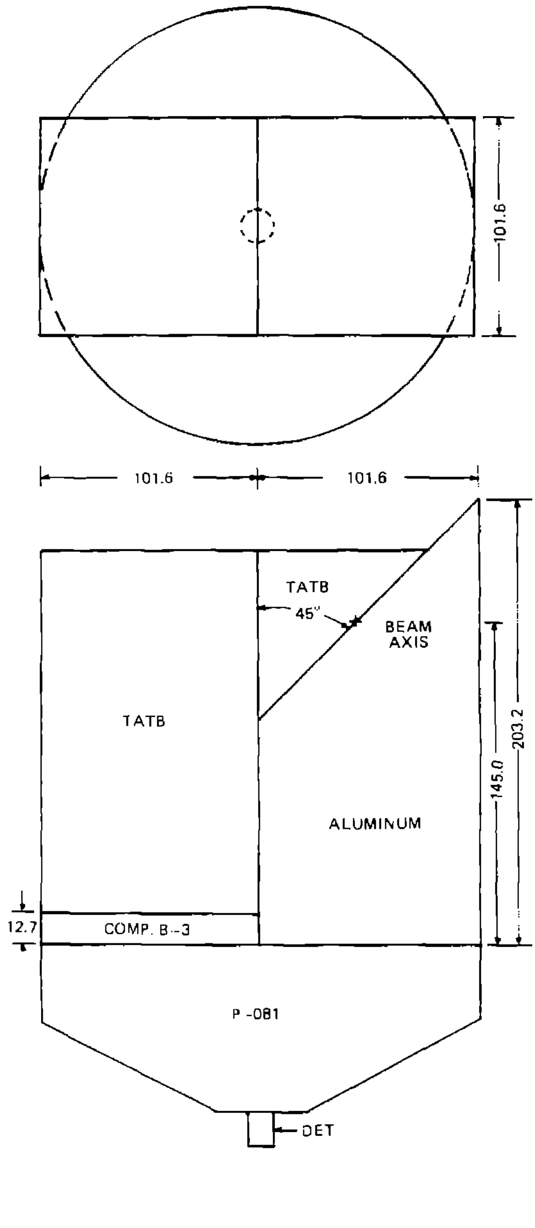
SHOT 1701: **TATB Turning a 45° Aluminum Corner**

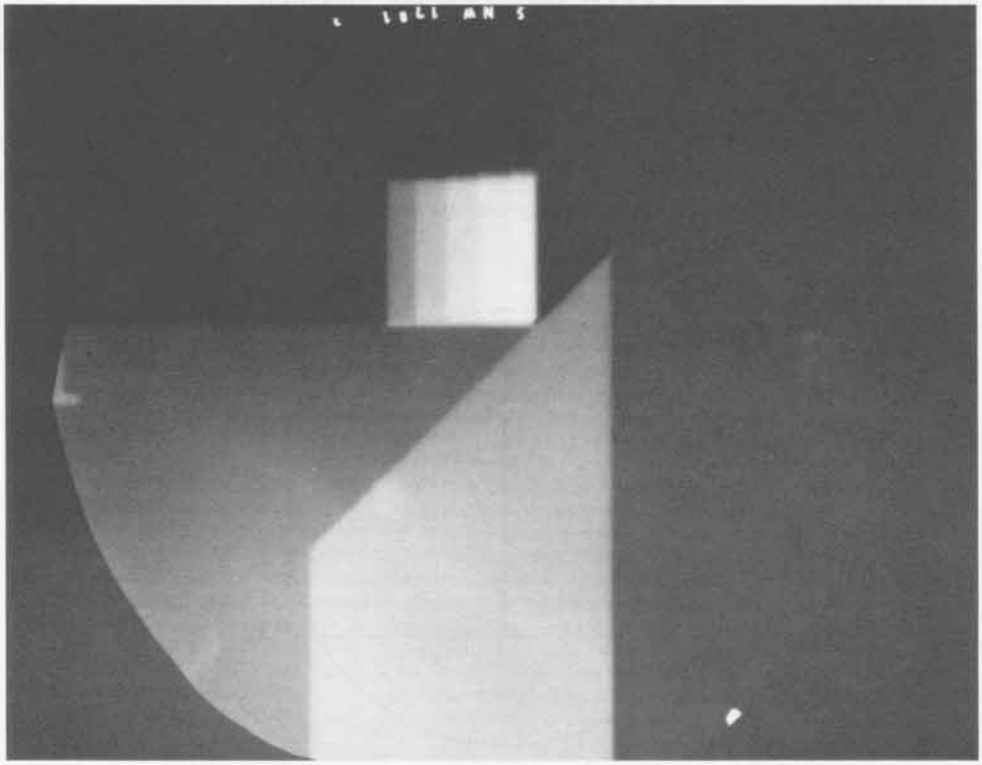
Date: April 29, 1976

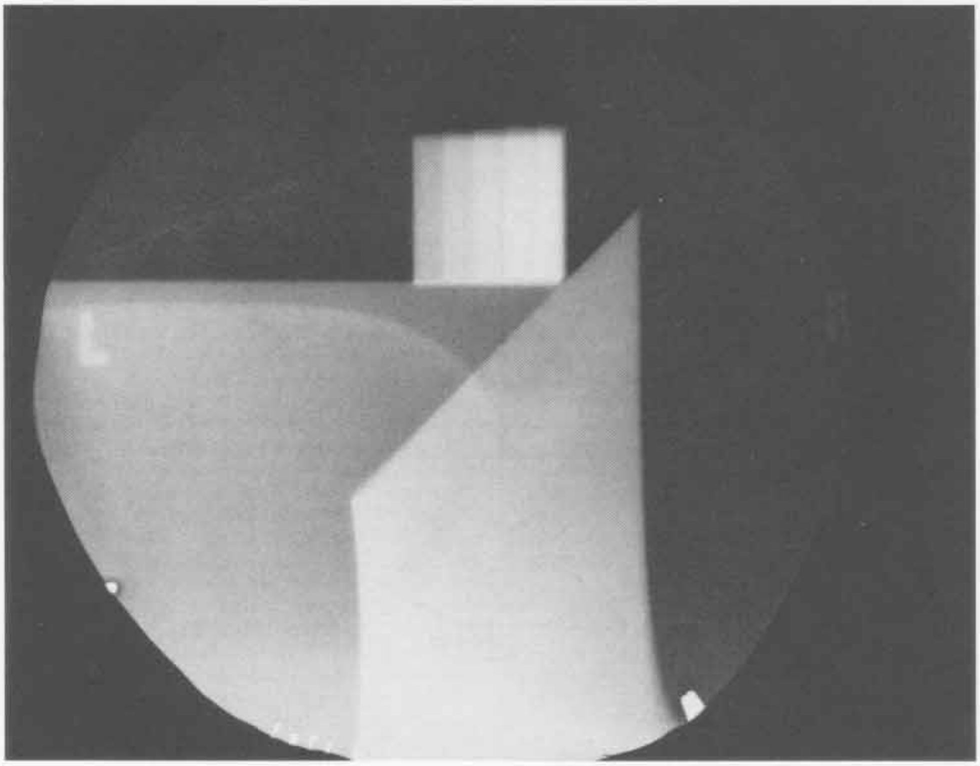
Experimenter: Richard D. Dick

Radiographic Time: 44.44 μs

An X0219 (90/10 wt% TATB/Kel-F at 1.914 g/cm³) detonation wave initiated by 12.7 mm of Composition B-3 and a P-081 lens turned an embedded 45° aluminum corner. A step wedge used for density calibration is shown on top of the shot.







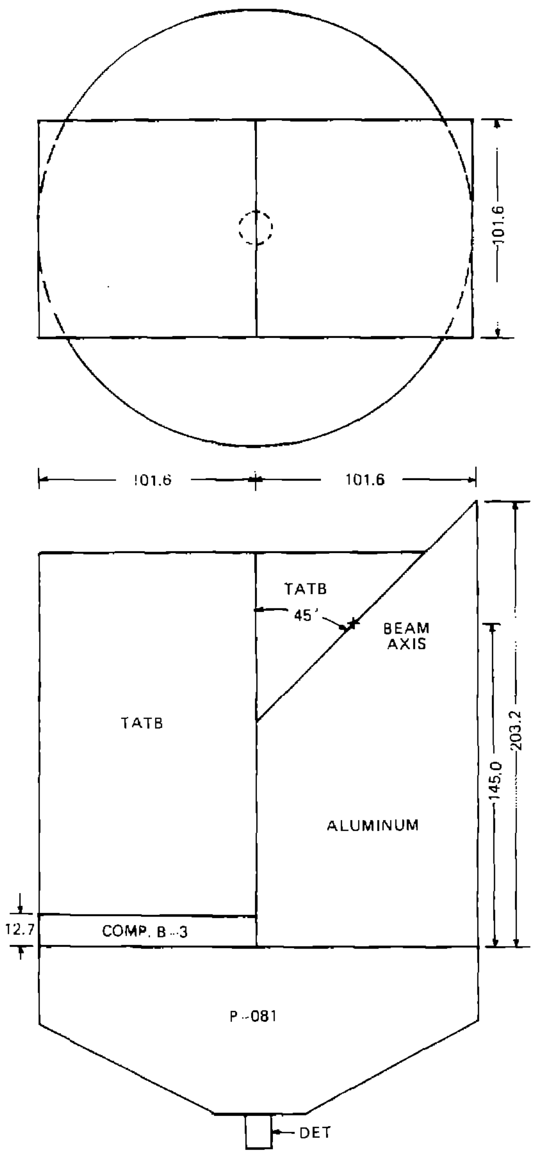
SHOT 1702: **TATB Turning a 45° Aluminum Corner**

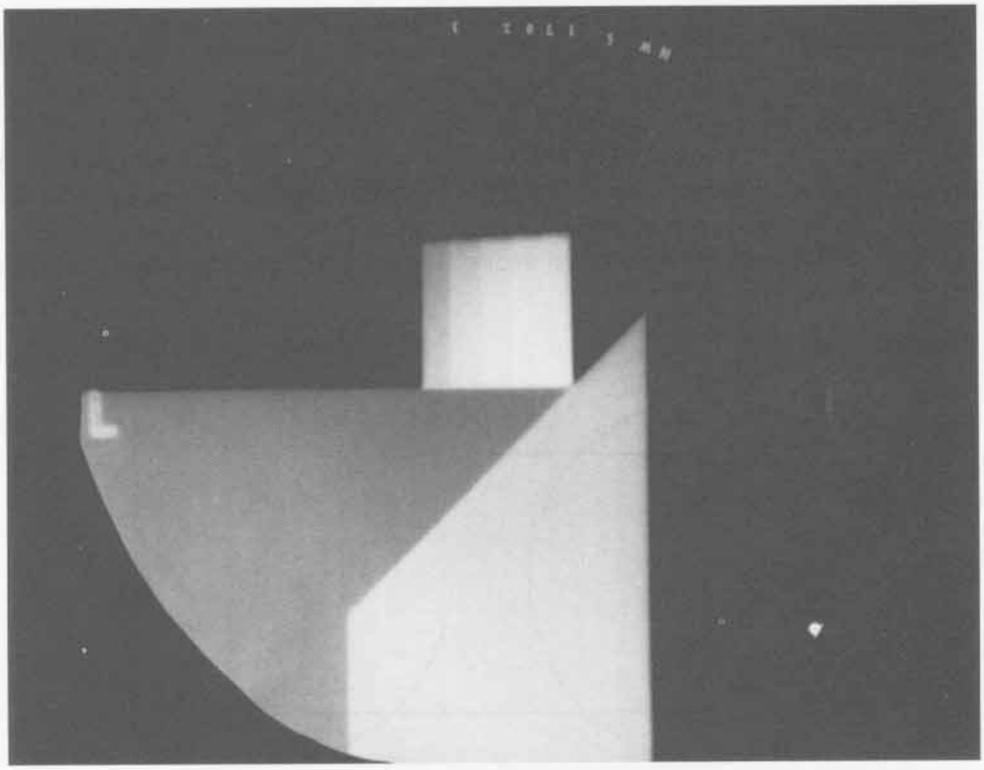
Date: May 4, 1976

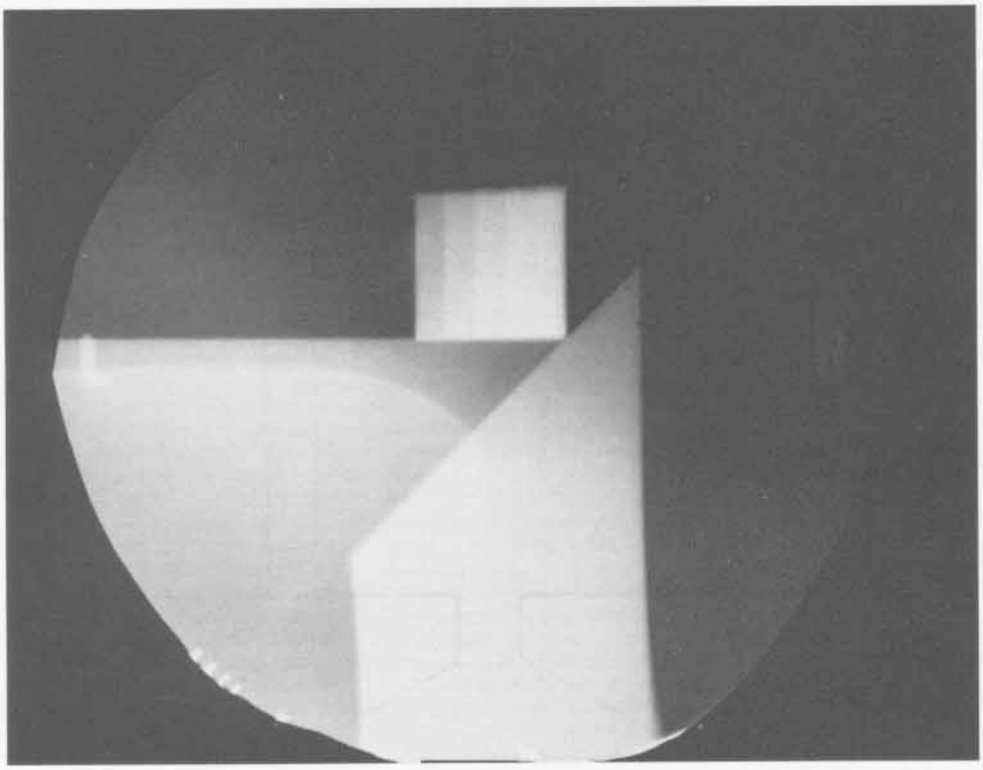
Experimenter: Richard D. Dick

Radiographic Time: 44.07 μs

A PBX-9502 (95/5 wt% TATB/Kel-F at 1.894 g/cm³) detonation wave initiated by 12.7 mm of Composition B-3 and a P-081 lens turned an embedded 45° aluminum corner. A step wedge used for density calibration is shown on top of the shot.

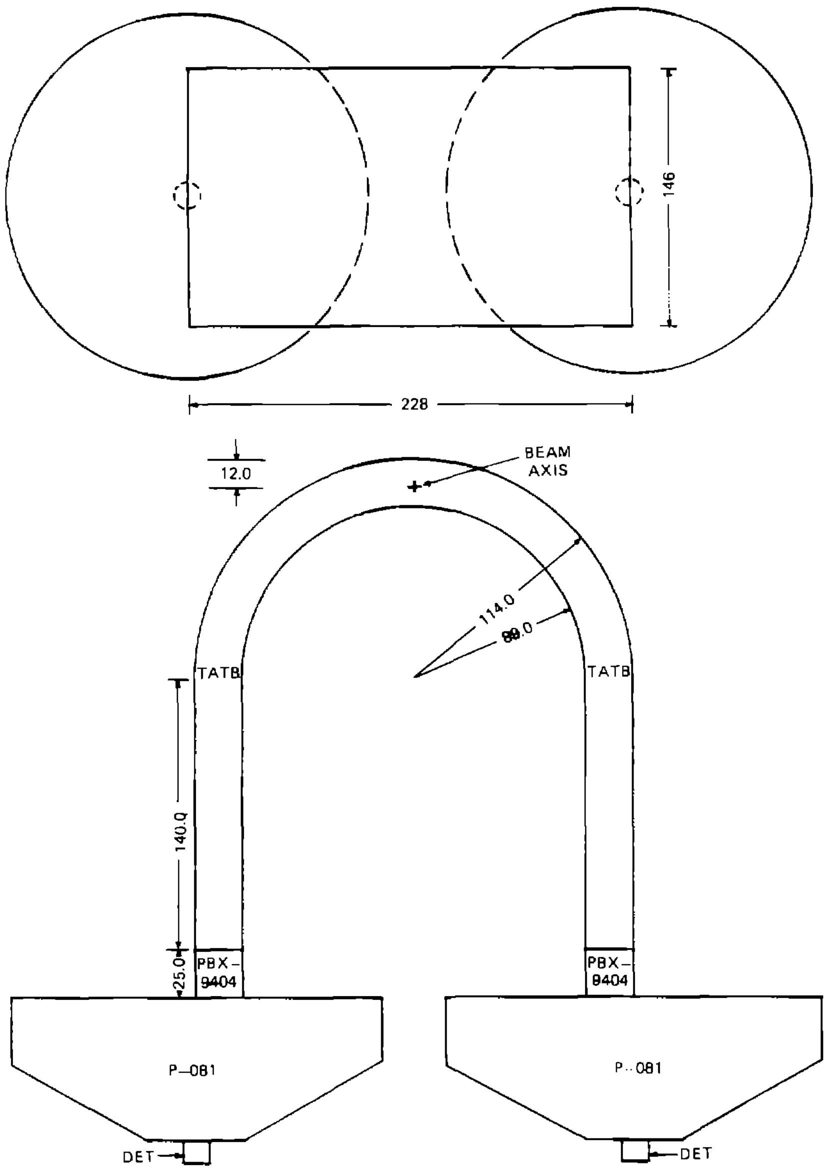


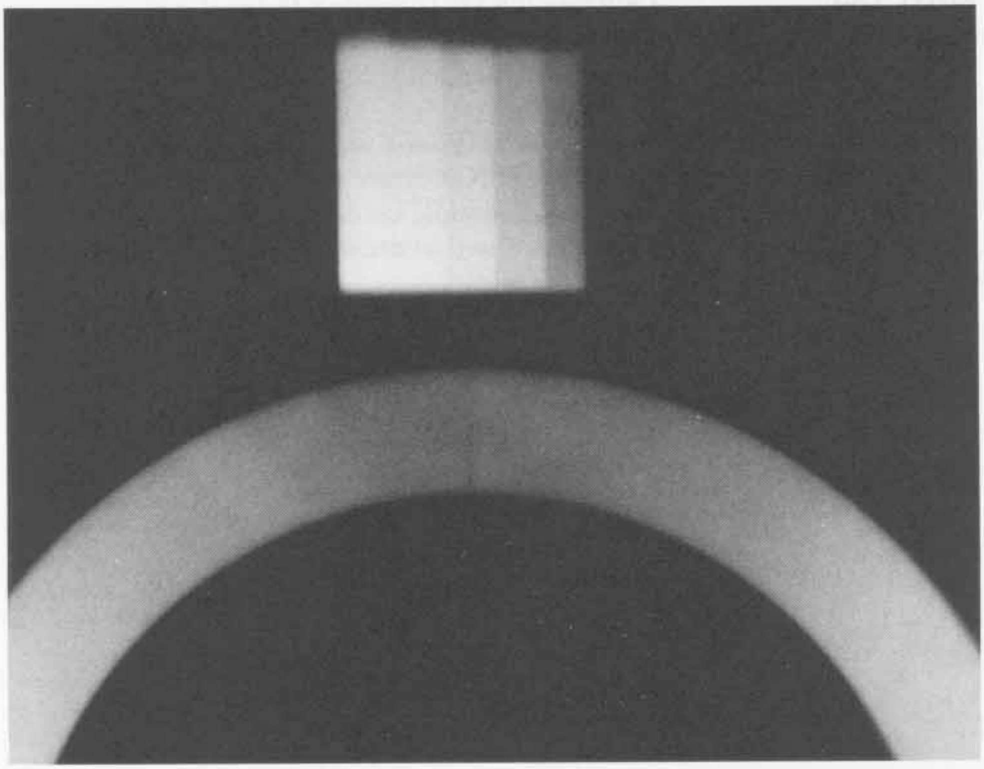


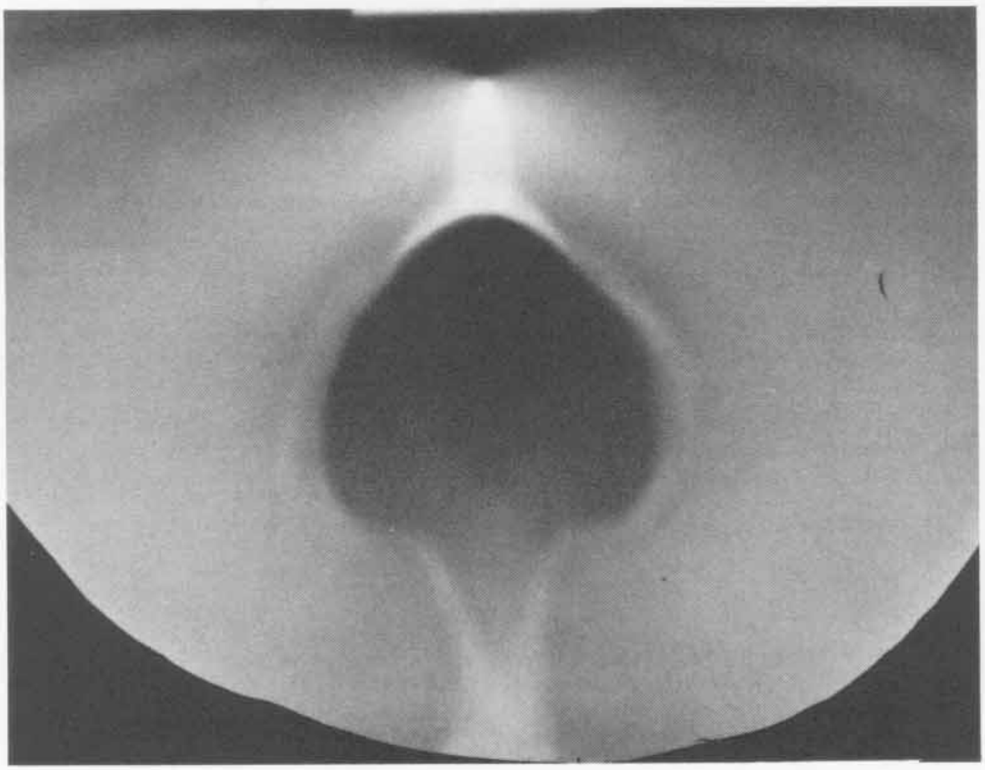


SHOT 1703: **Colliding TATB Diverging Detonations**
Date: May 4, 1976
Experimenter: Richard D. Dick
Radiographic Time: 65.11 μs

Two diverging X0219 (90/10 wt% TATB/Kel-F at 1.914 g/cm³) detonations formed by simultaneously initiating the two ends of an X0219 arc of 89.0-mm inner radius and 114.0-mm outer radius were radiographed while the detonations were colliding. See Shot 1938 for a later time. A step wedge used for density calibration is shown on top of the shot.

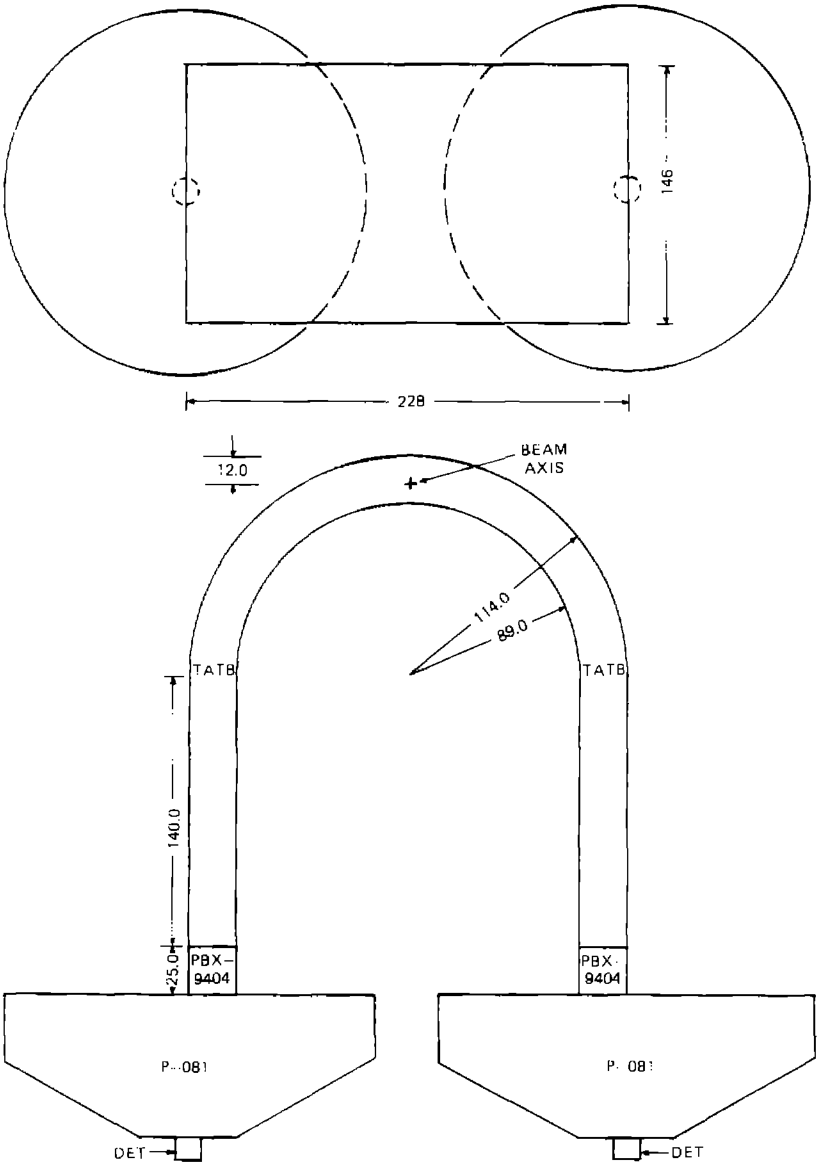


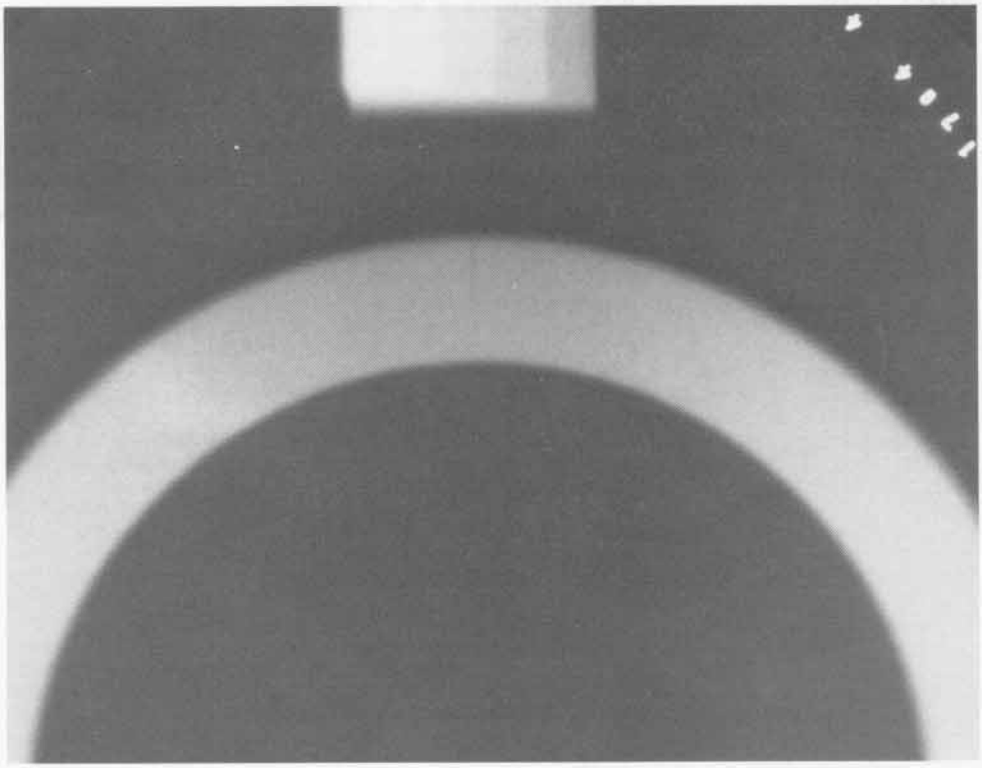


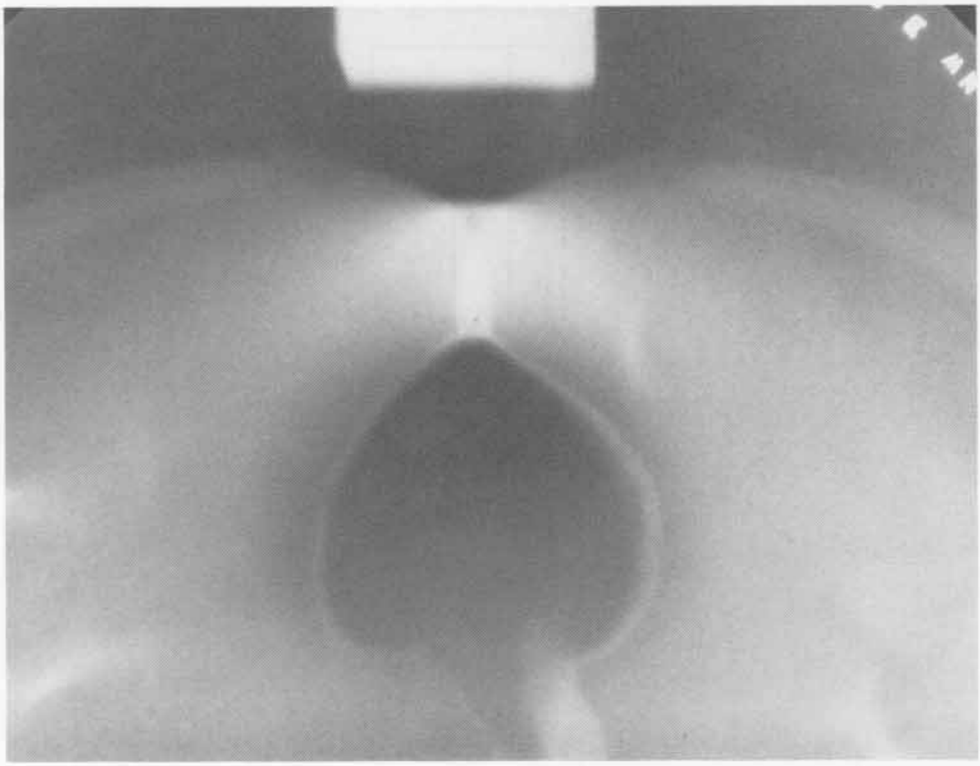


SHOT 1704: **Colliding TATB Diverging Detonations**
Date: May 5, 1976
Experimenter: Richard D. Dick
Radiographic Time: 64.47 μs

Two diverging PBX-9502 (95/5 wt% TATB/Kel-F at 1.894 g/cm³) detonations formed by initiating the two ends of a PBX-9502 arc of 89.0-mm inner radius and 114.0-mm outer radius were radiographed while the detonations were colliding. See Shot 1939 for a later time. A step wedge used for density calibration is shown on top of the shot.

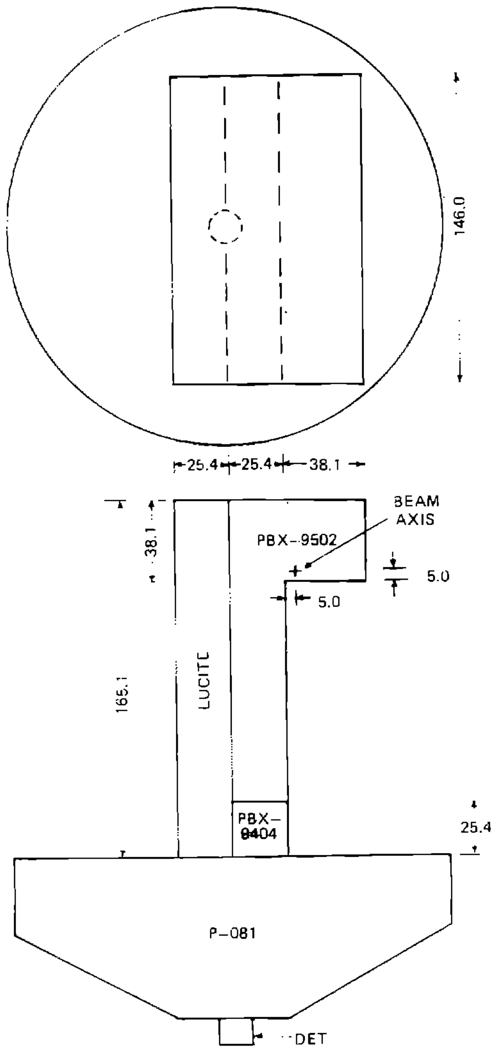


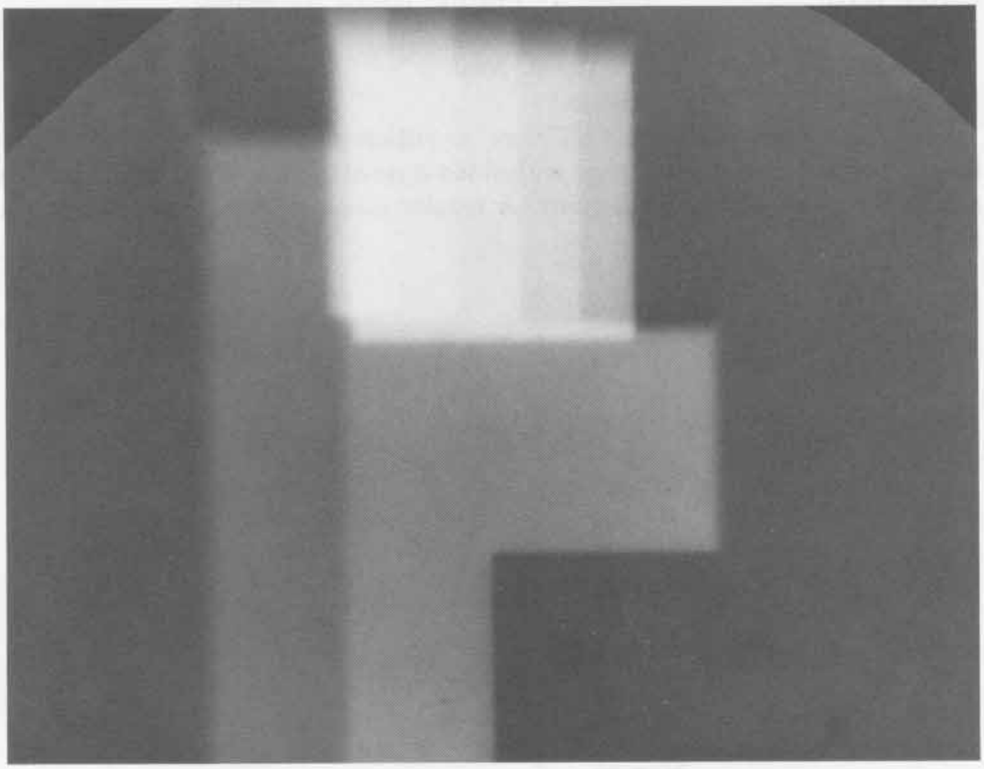


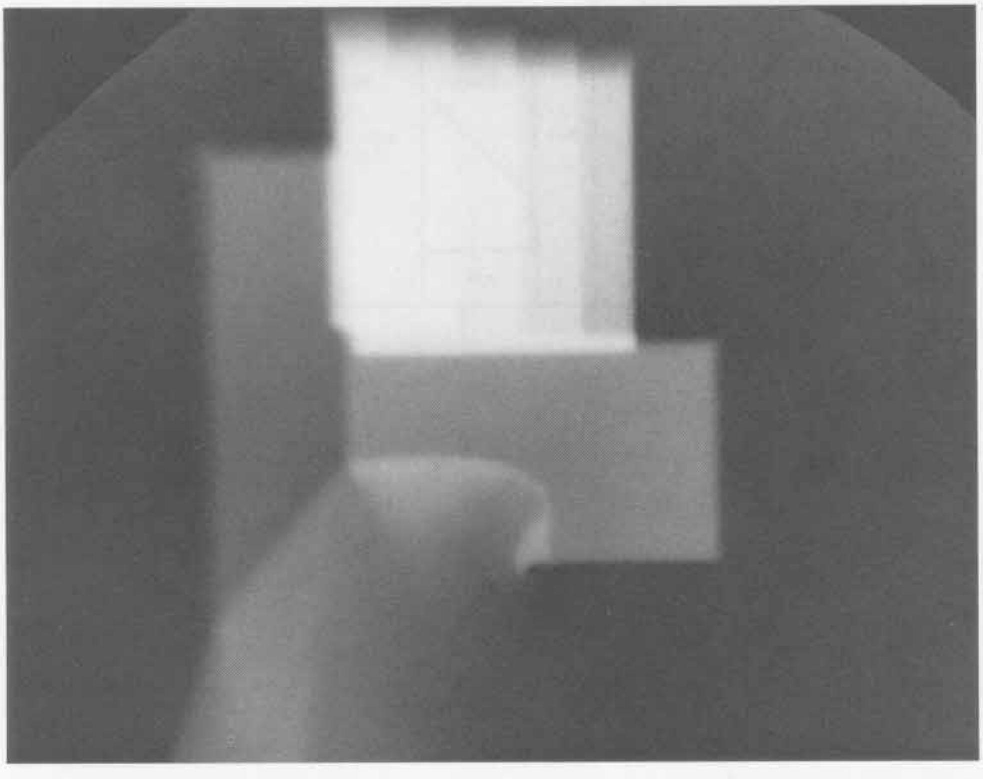


SHOT 1705: **TATB Turning a 90° Corner**
Date: May 4, 1976
Experimenter: Richard D. Dick
Radiographic Time: 41.85 μs

A PBX-9502 (95/5 wt% TATB/Kel-F at 1.894 g/cm³) detonation wave was initiated by 25.4 mm of PBX-9404 and a P-081 lens turning a 90° corner. See also Shots 1937, 1941, and 1943. A step wedge used for density calibration is shown on top of the shot.

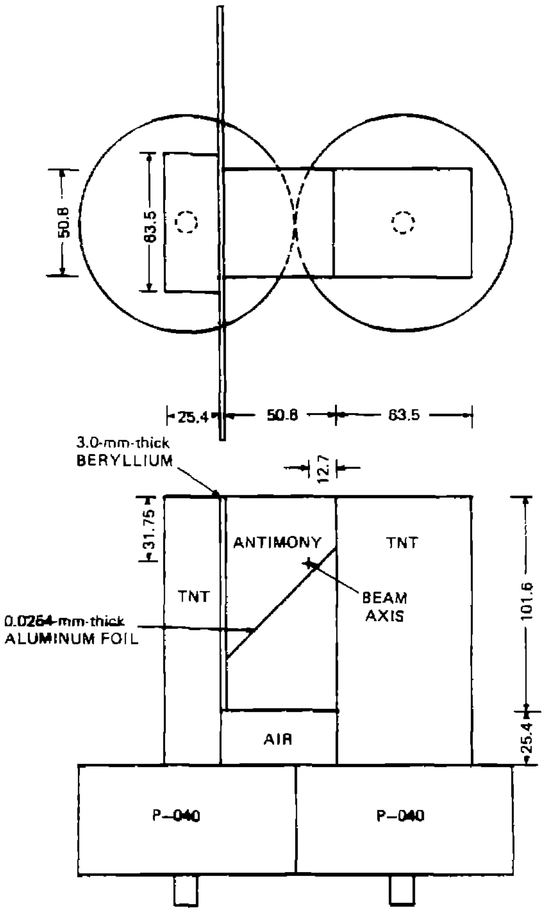


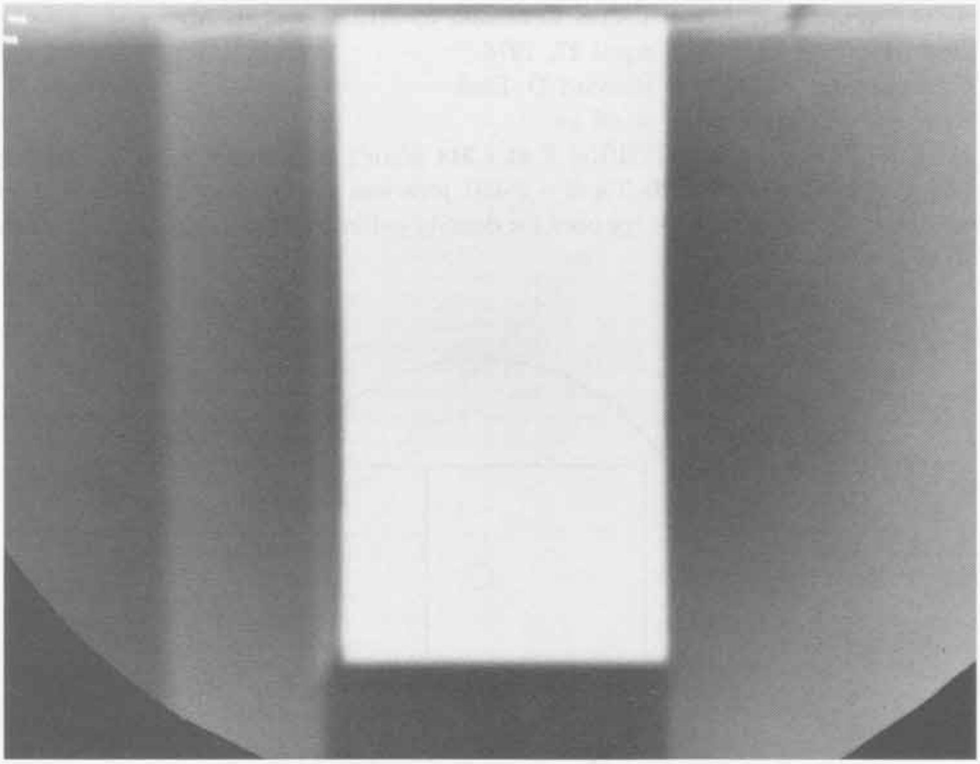


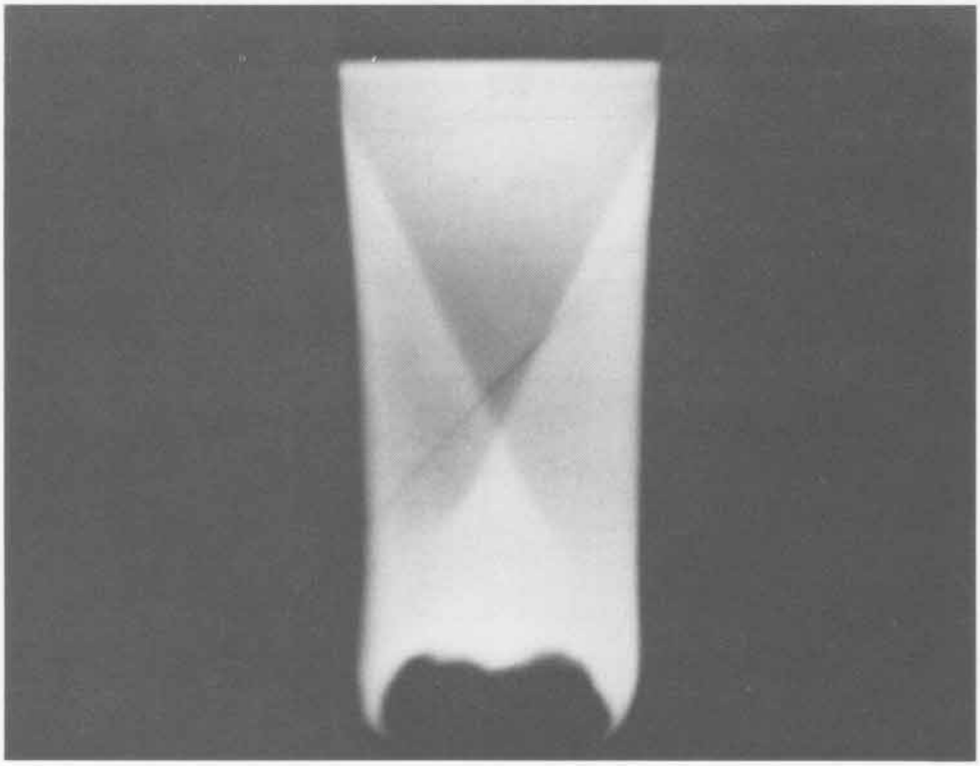


SHOT 1711: **Antimony Regular Shock Reflection**
Date: April 13, 1976
Experimenter: Timothy R. Neal
Radiographic Time: 30.96 μs

Two 127-mm-high blocks of TNT were simultaneously initiated by two P-040 lenses. They obliquely shocked an embedded layer of 3.0-mm-thick beryllium and a 50.8-mm-thick block of antimony. A regular shock reflection occurred in the antimony.

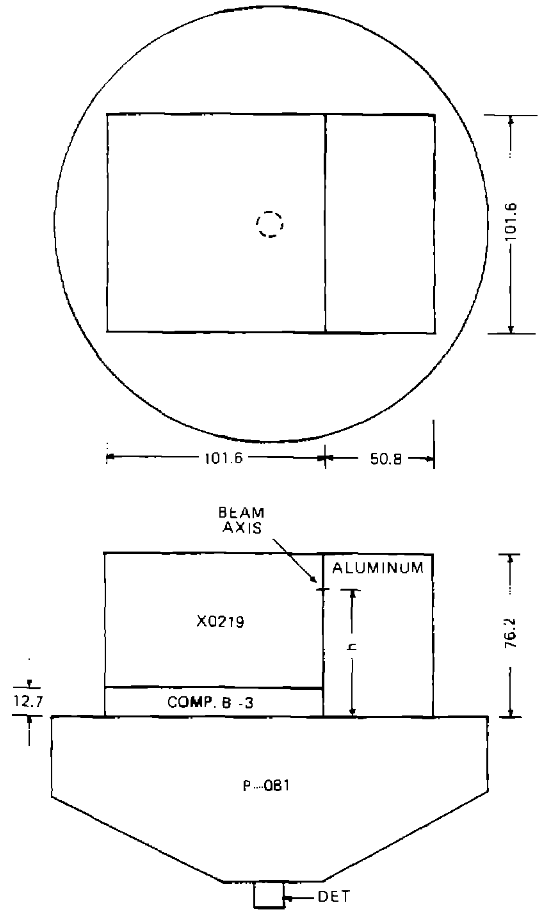


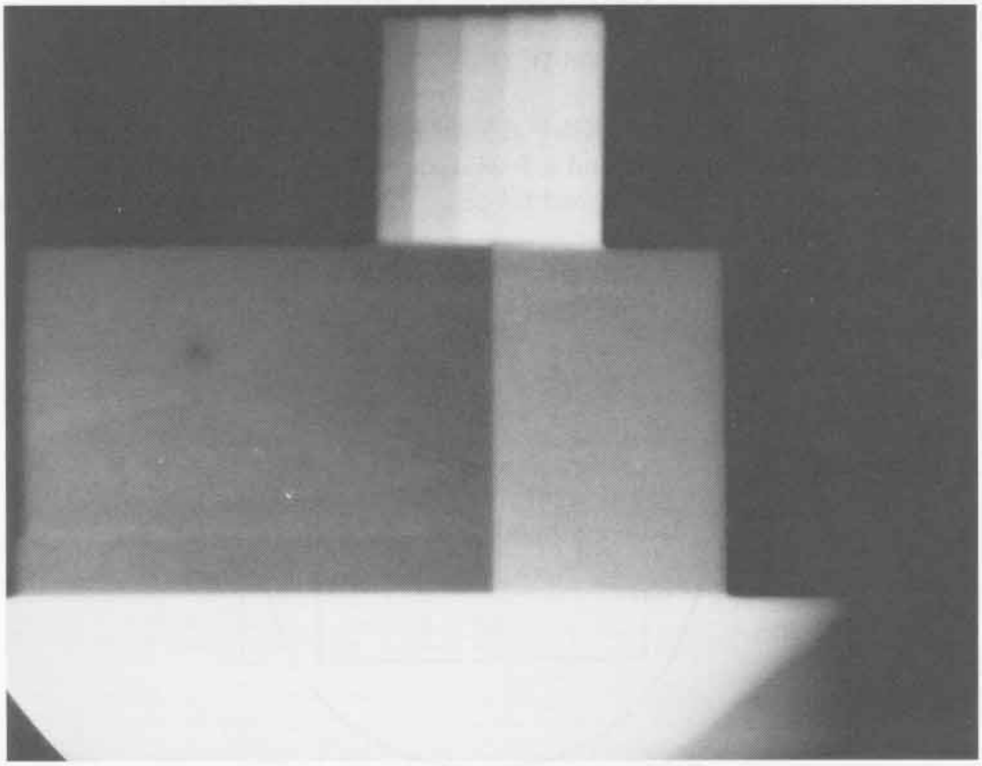


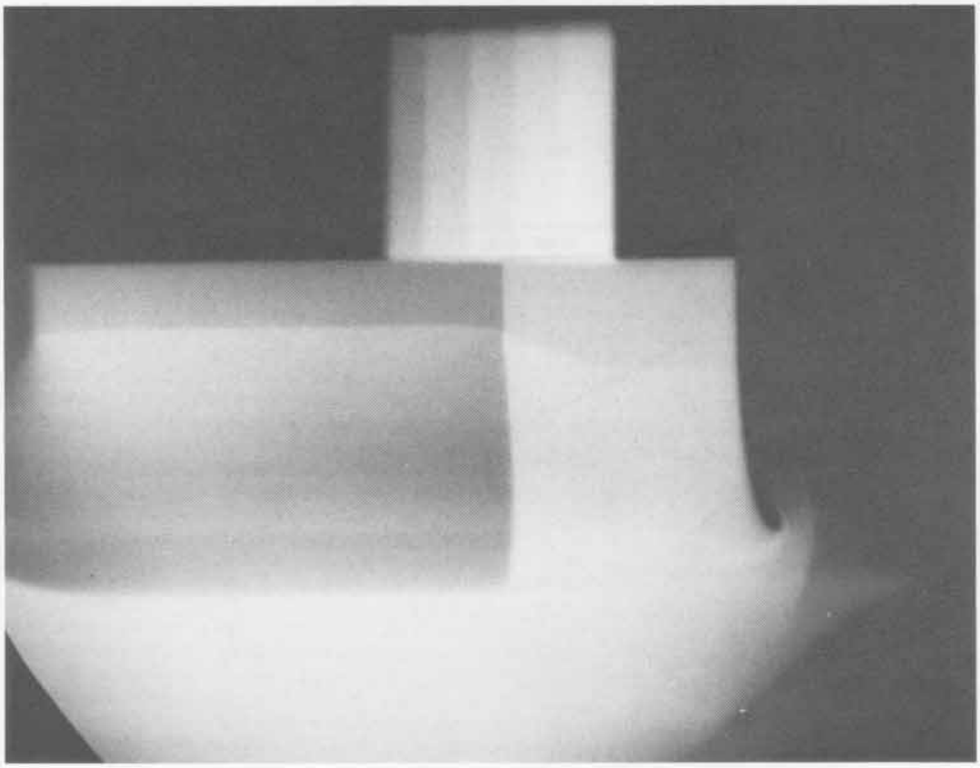


SHOT 1713: **TATB Confined by Aluminum in Air**
Date: April 27, 1976
Experimenter: Richard D. Dick
Radiographic Time: 30.66 μs

An X0219 (90/10 wt% TATB/Kel-F at 1.914 g/cm^3) detonation wave initiated by 12.7 mm of Composition B-3 and a P-081 lens was confined by a 50.8-mm-thick aluminum plate. A step wedge used for density calibration was shown on top of the shot. h was 60.0 mm.

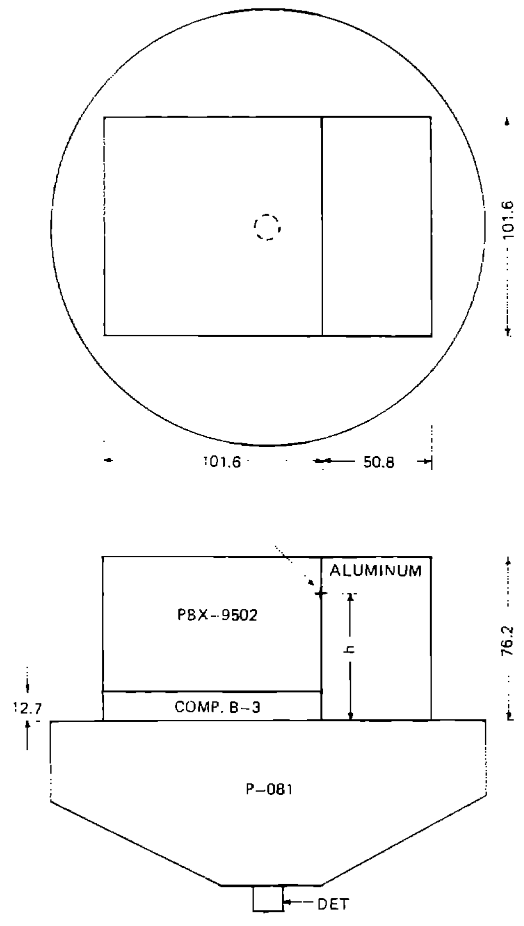


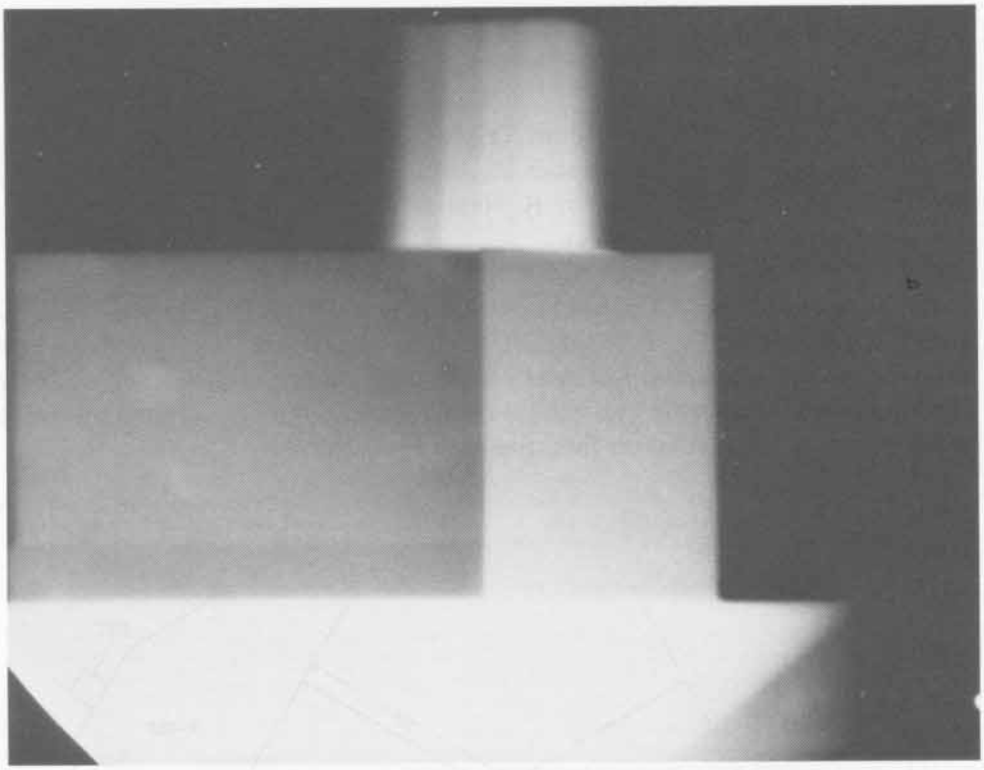


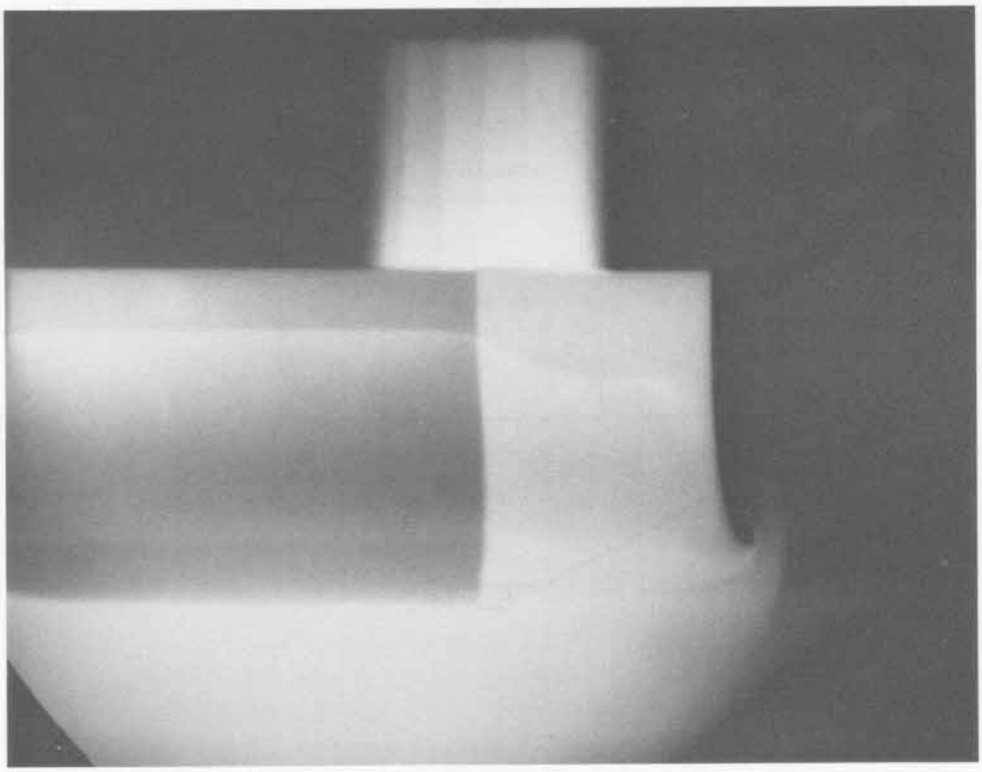


SHOT 1714: **TATB Confined by Aluminum and Air**
Date: April 27, 1976
Experimenter: Richard D. Dick
Radiographic Time: 30.67 μs

A PBX-9502 (95/5 wt% TATB/Kel-F at 1.894 g/cm³) detonation wave initiated by 12.7 mm of Composition B-3 and a P-081 lens was confined by a 50.8-mm-thick aluminum plate. A step wedge used for density calibration is shown on top of the shot. h was 60.0 mm.

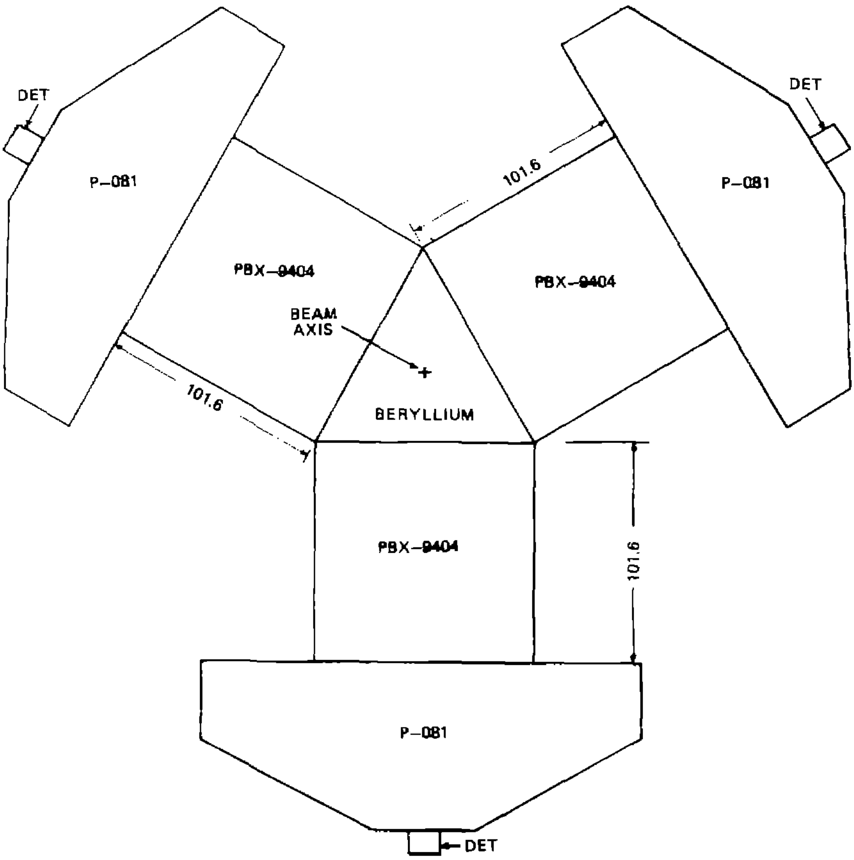


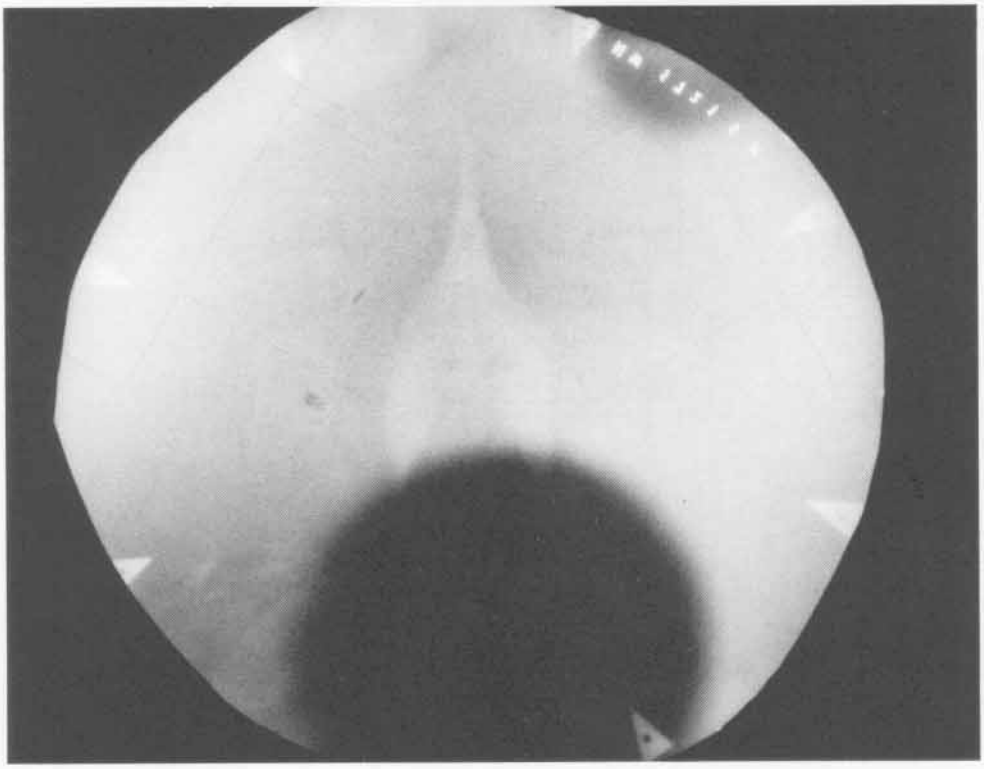




SHOT 1721:	**Beryllium Triple-Shock Reflection**
Date:	September 15, 1976
Experimenter:	Timothy R. Neal
Radiographic Time:	37.46 μs
Reference:	Neal, 1979

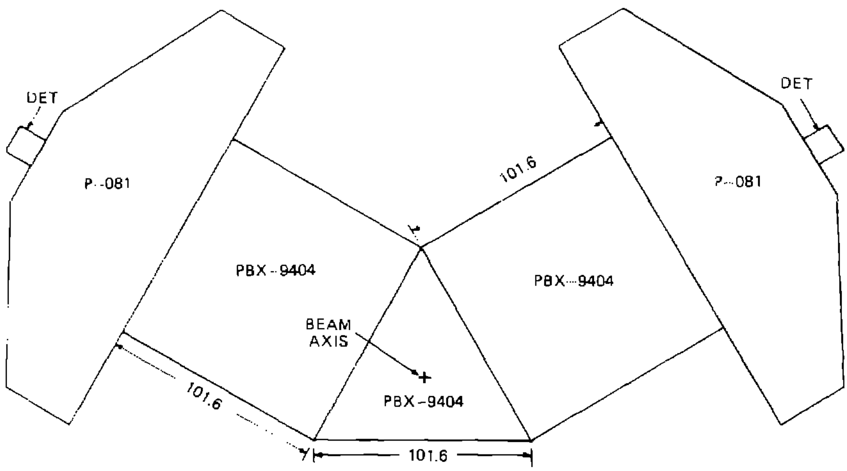
Three 101.6-mm PBX-9404 cubes in contact with a 60° beryllium wedge were initiated simultaneously by P-081 lenses. A triple-interaction shock wave occurred when the three regular reflection shocks collided. The x-ray beam was collimated to provide shrapnel protection, and the darker area in the center of the radiograph was a region of high radiation flux. See also Shot 1338.

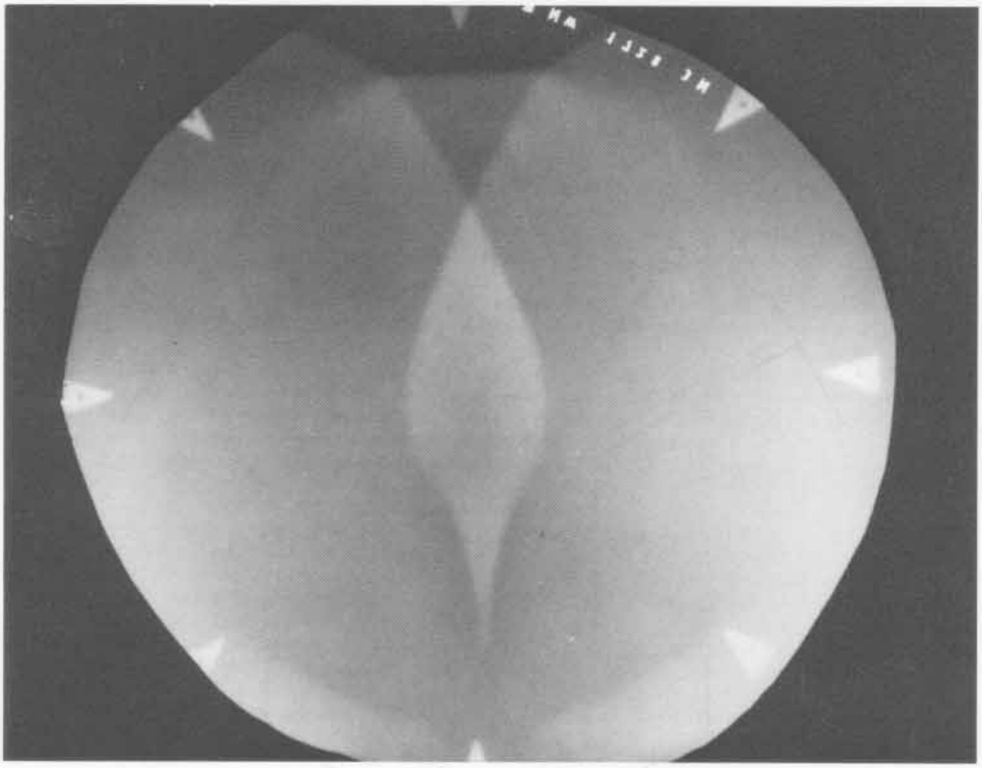




SHOT 1728: **Regular Reflection in PBX-9404**
Date: August 26, 1976
Experimenter: Timothy R. Neal
Radiographic Time: 37.48 μs

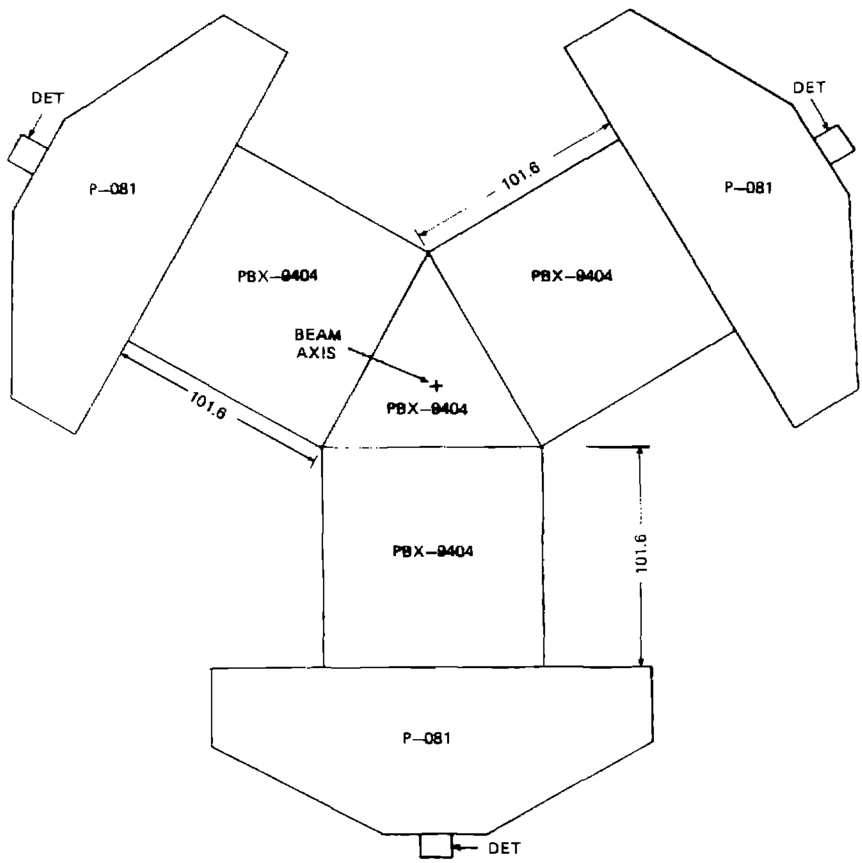
Two PBX-9404 detonation waves interacted to form a regular reflection. The detonation waves formed when two 101.6-mm cubes of PBX-9404 initiated by P-081 lenses simultaneously initiated two sides of a 60° PBX-9404 wedge.

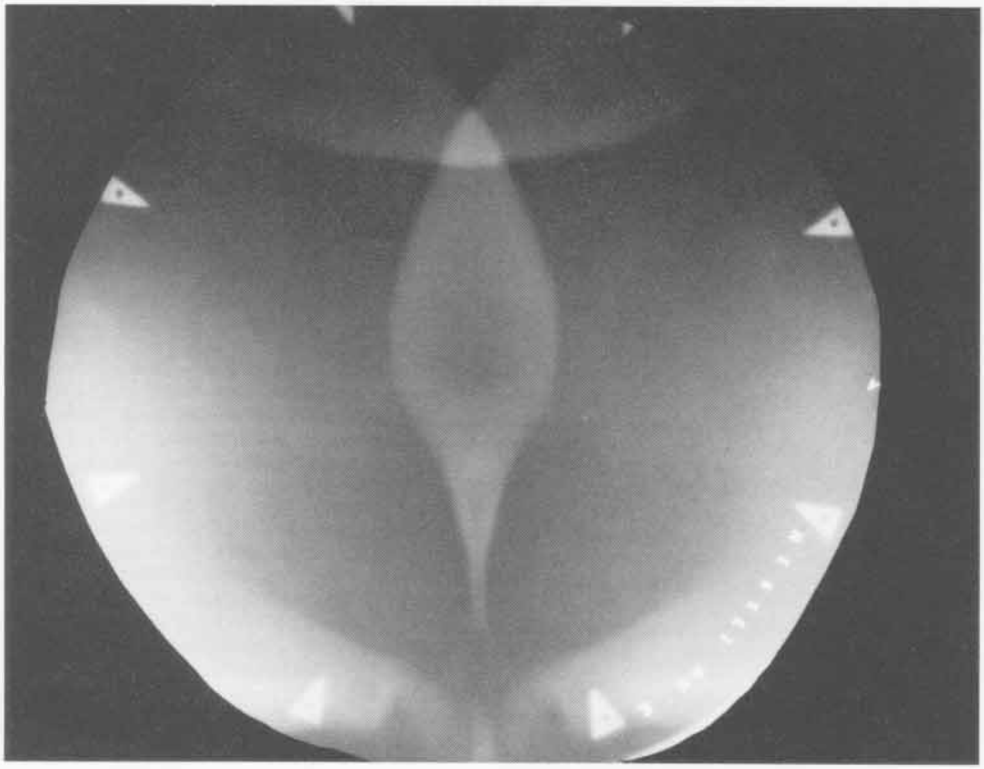




SHOT 1729: **PBX-9404 Triple Regular Reflection**
Date: September 15, 1976
Experimenter: Timothy R. Neal
Radiographic Time: 38.06 μs

Three PBX-9404 detonation waves formed by 101.6-mm cubes of PBX-9404 initiated by P-081 lenses simultaneously initiated the three sides of a 60° PBX-9404 wedge. A triple-interaction wave occurred when the three regular reflection shocks in the detonation products collided.





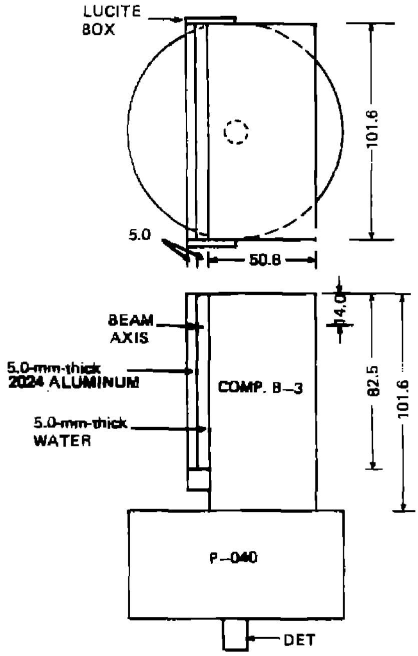
SHOT 1734: **Oblique Shocks in Water**

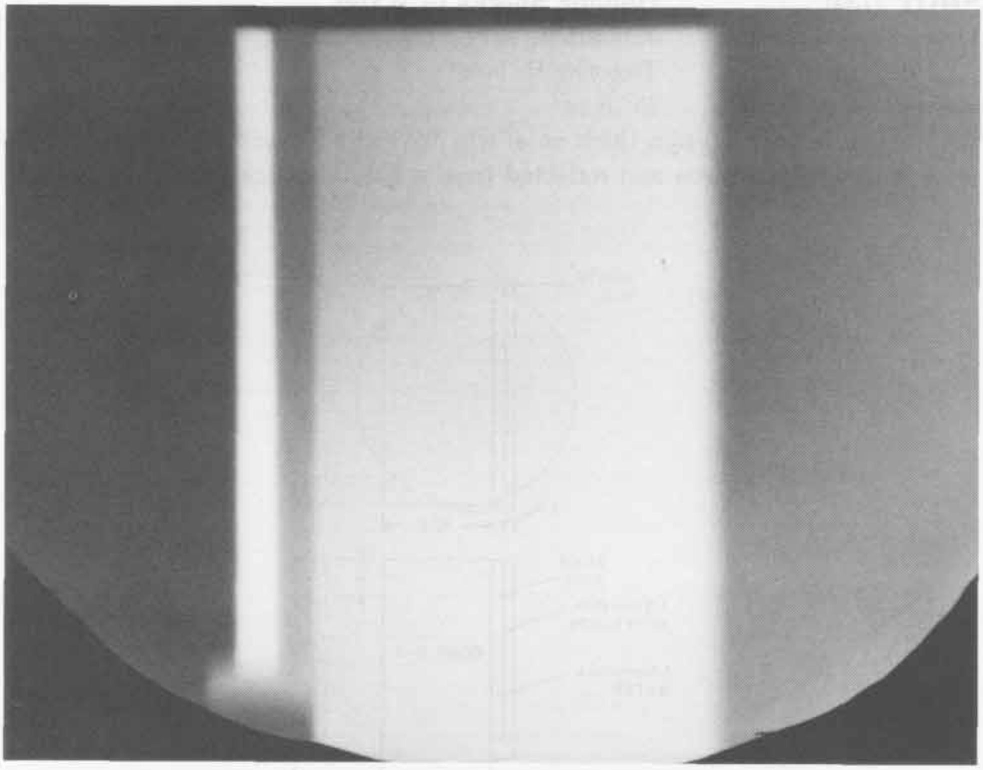
Date: January 4, 1977

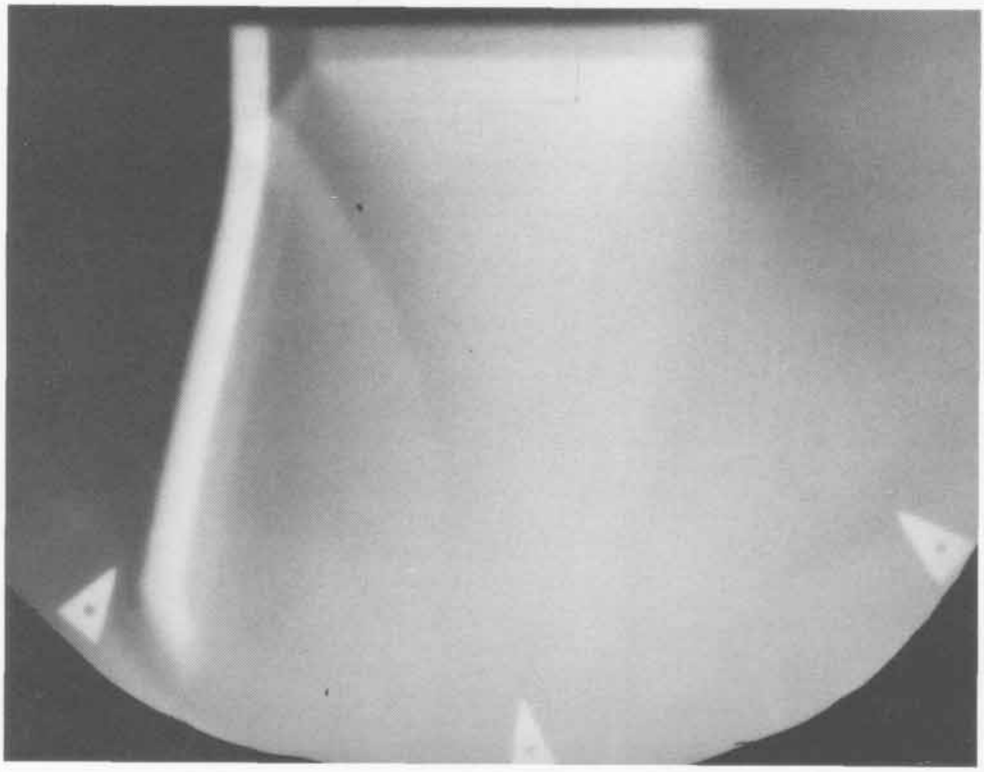
Experimenter: Timothy R. Neal

Radiographic Time: 25.83 μs

An oblique shock in 5.0-mm-thick water was driven by 50.8 mm of Composition B-3 initiated by a P-040 lens and reflected from a 5.0-mm-thick aluminum plate.

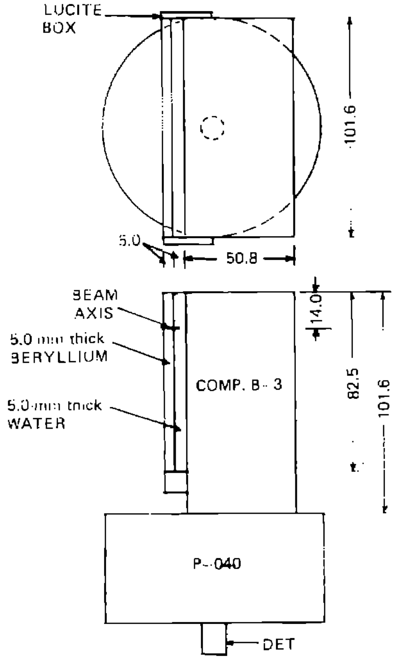


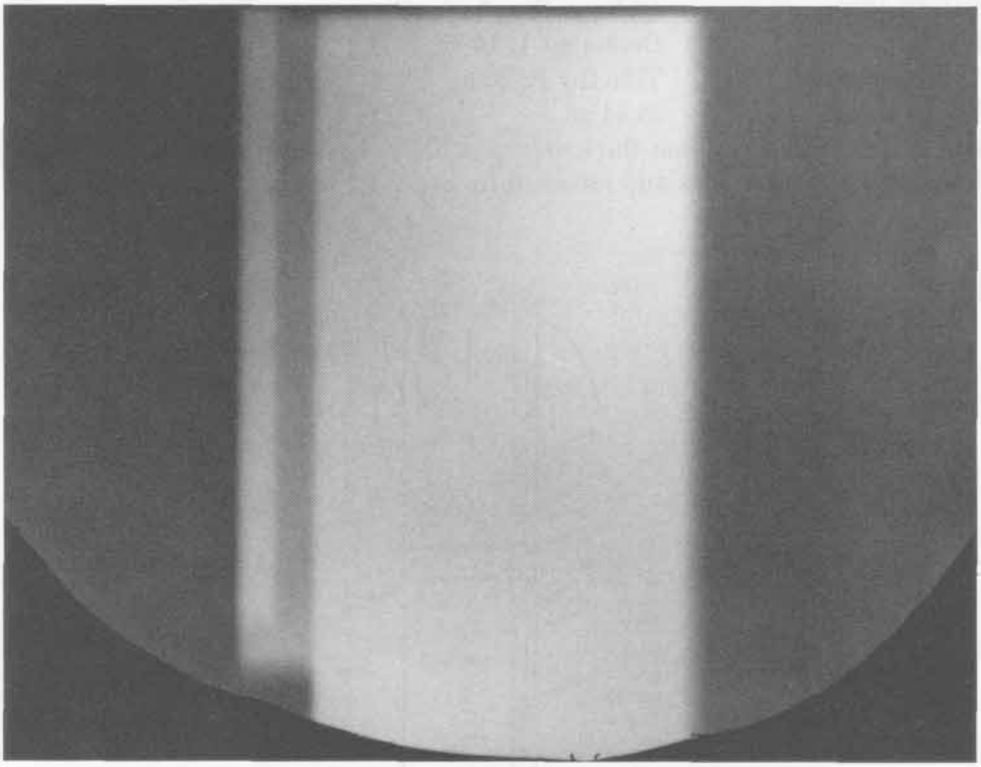


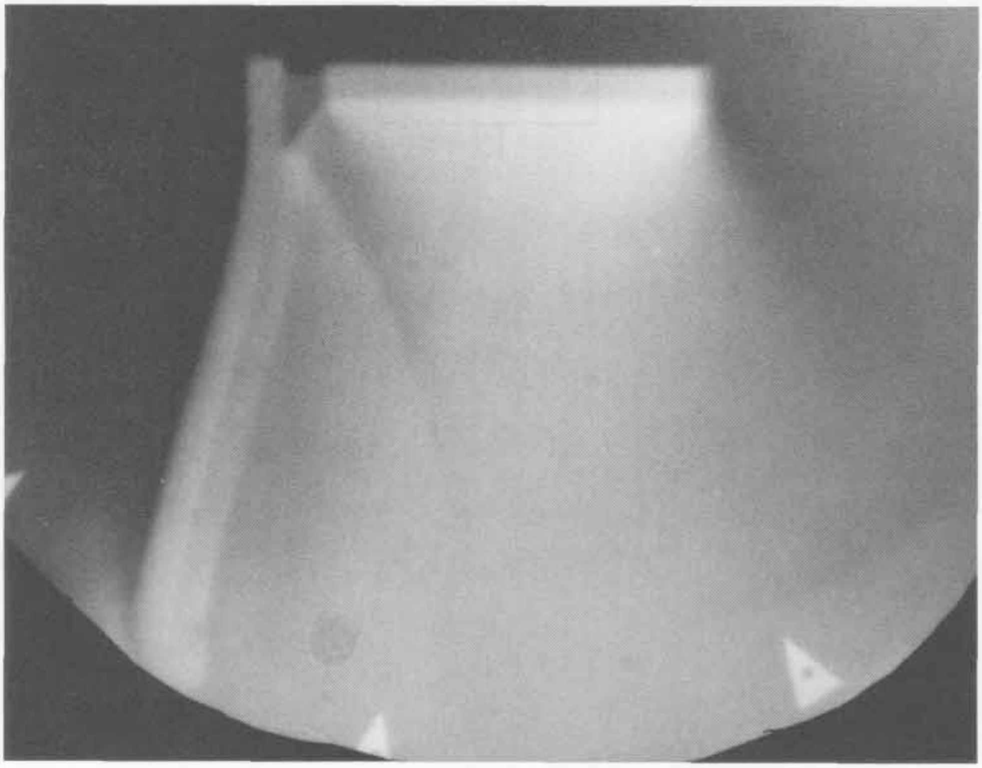


SHOT 1735: **Oblique Shocks in Water**
Date: January 4, 1977
Experimenter: Timothy R. Neal
Radiographic Time: 25.78 μs

An oblique shock in 5.0-mm-thick water was driven by 50.8 mm of Composition B-3 initiated by a P-040 lens and reflected from a 5.0-mm-thick beryllium plate.

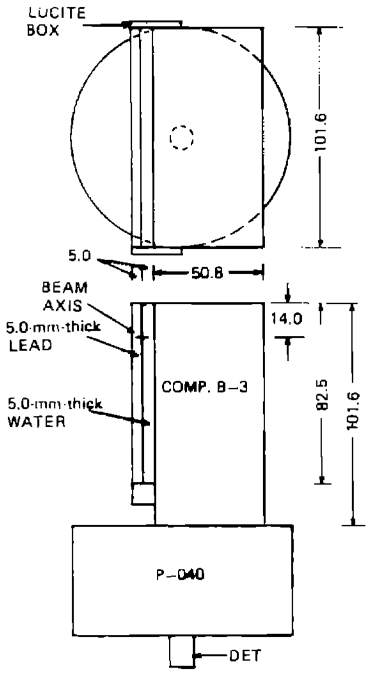


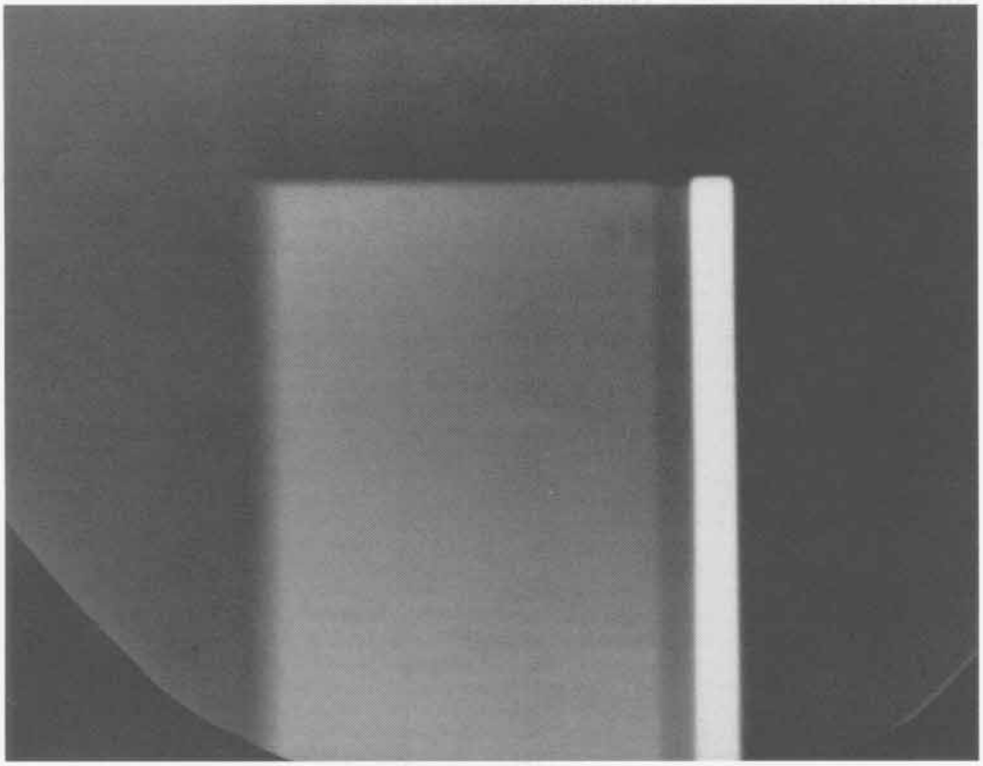


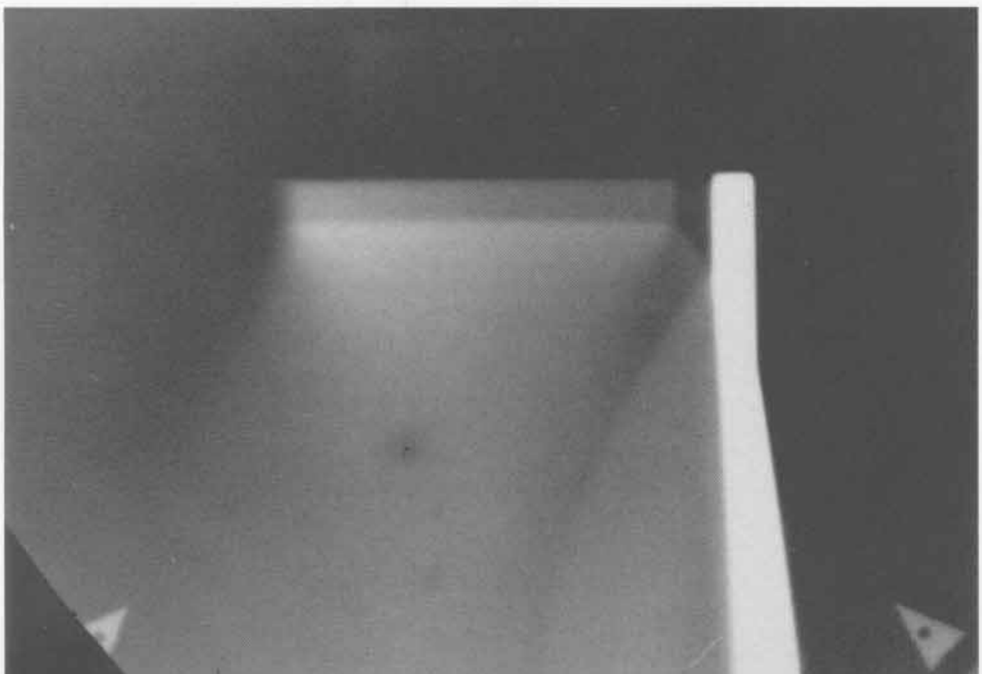


SHOT 1736: **Oblique Shocks in Water**
Date: December 1, 1976
Experimenter: Timothy R. Neal
Radiographic Time: 25.74 μs

An oblique shock in 5.0-mm-thick water was driven by 50.8 mm of Composition B-3 initiated by a P-040 lens and reflected from a 5.0-mm-thick lead plate.

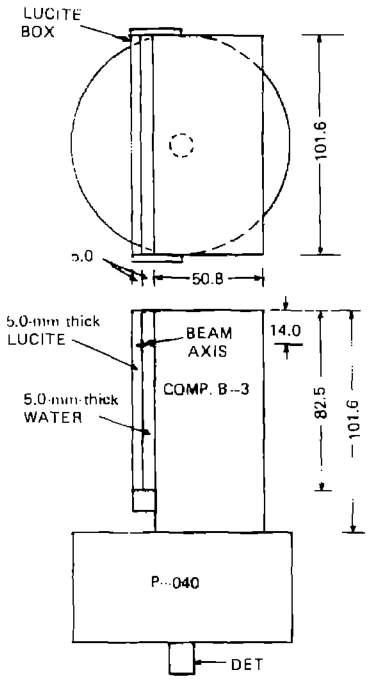


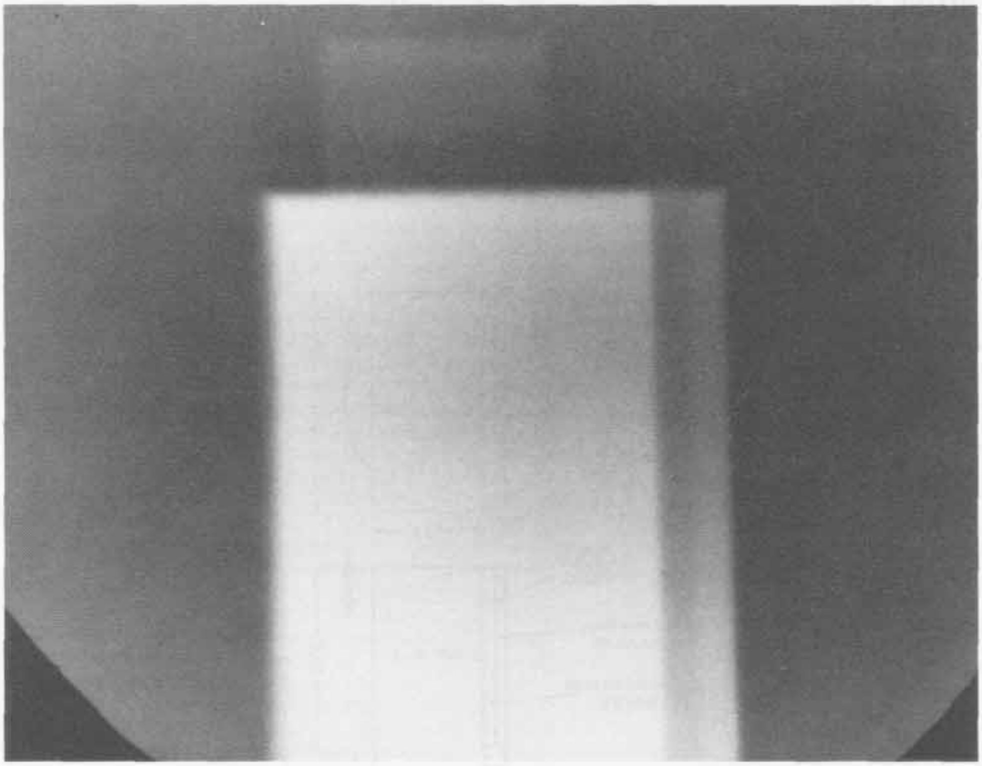


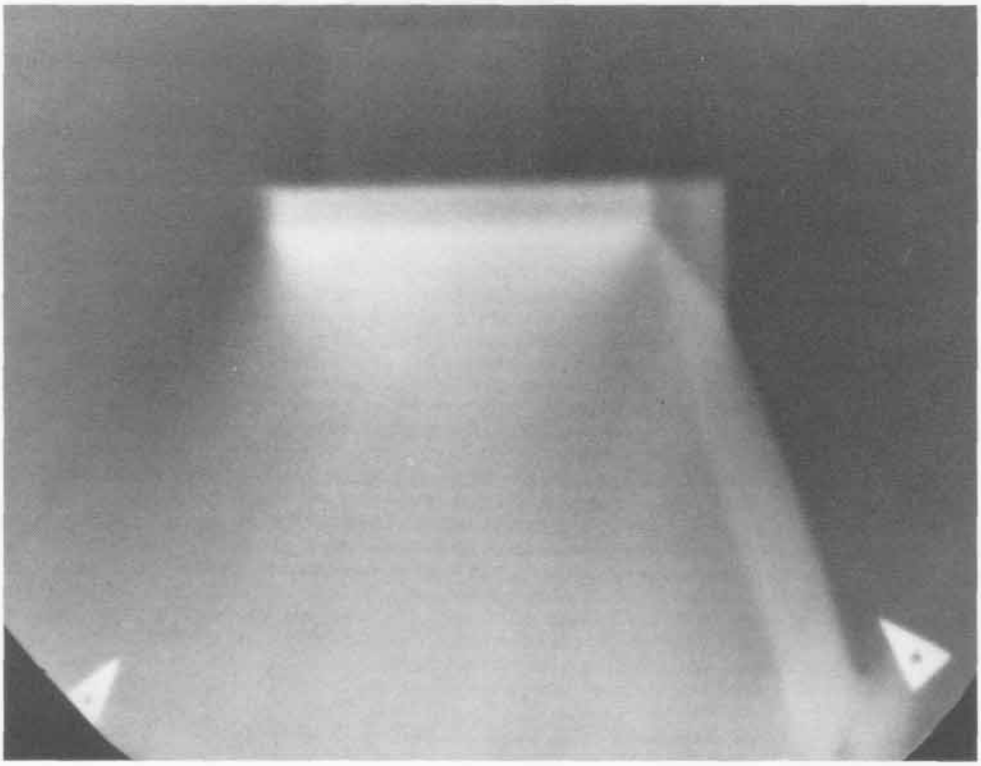


SHOT 1737: **Oblique Shocks in Water**
Date: December 1, 1976
Experimenter: Timothy R. Neal
Radiographic Time: 25.82 μs

An oblique shock in 5.0-mm-thick water was driven by 50.8 mm of Composition B-3 initiated by a P-040 lens and reflected from a 5.0-mm-thick Lucite plate. See also Shot 1778.

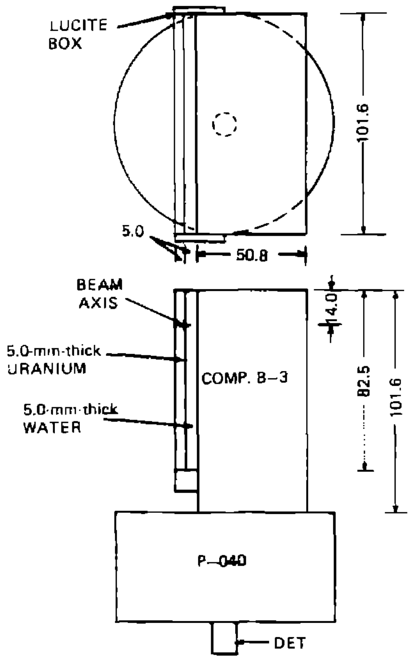


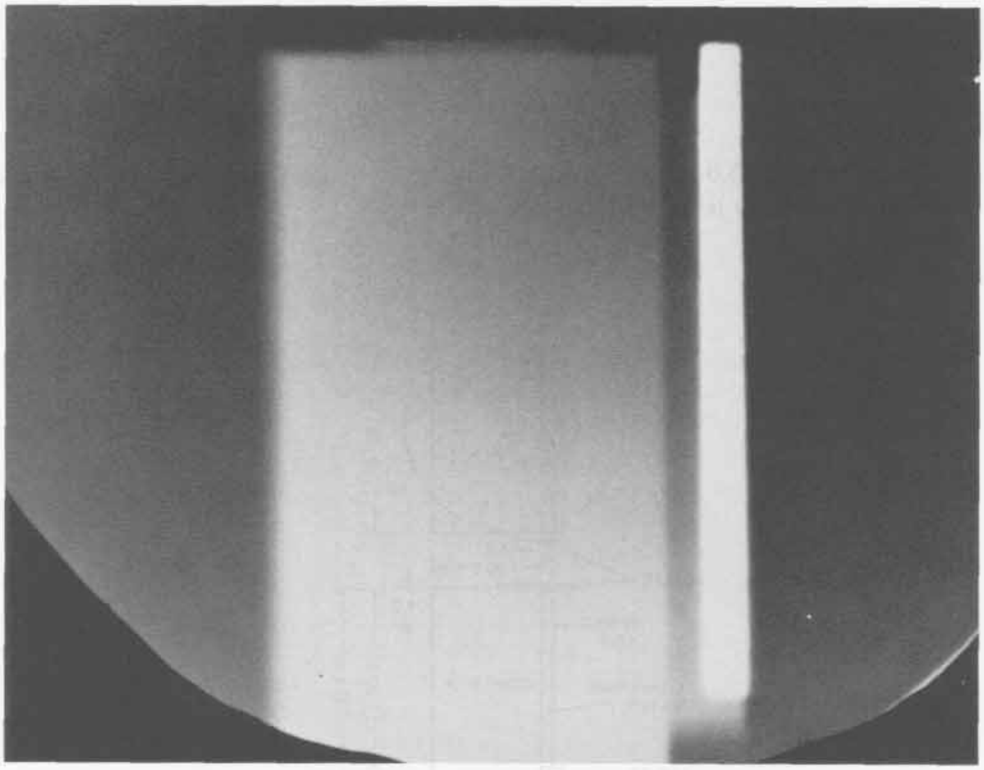


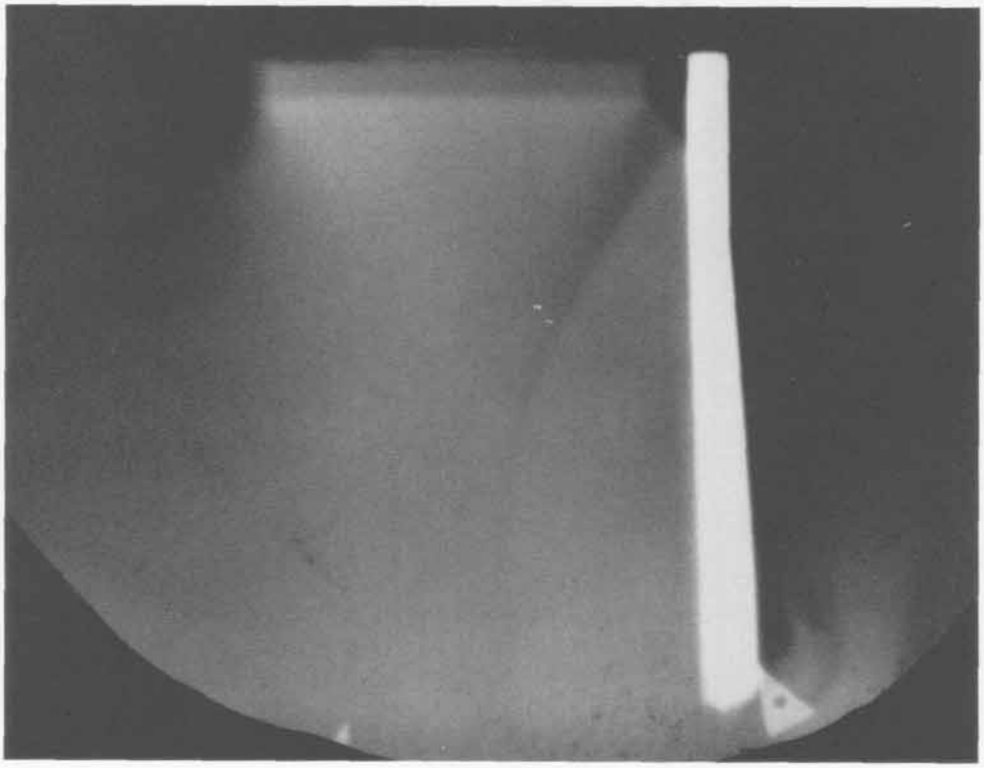


SHOT 1738: **Oblique Shocks in Water**
Date: December 14, 1976
Experimenter: Timothy R. Neal
Radiographic Time: 25.82 μs

An oblique shock in 5.0-mm-thick water was driven by 50.8 mm of Composition B-3 initiated by a P-040 lens and reflected from a 5.0-mm-thick uranium plate.

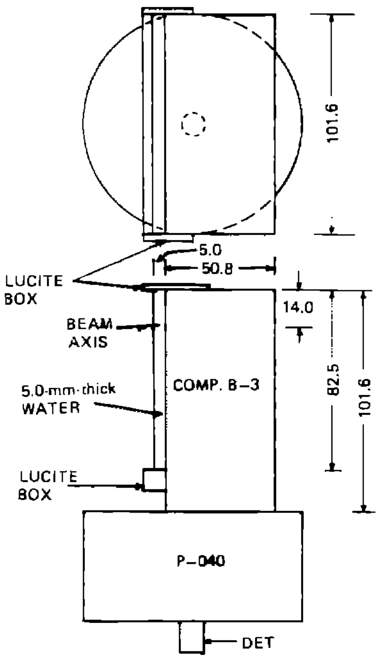


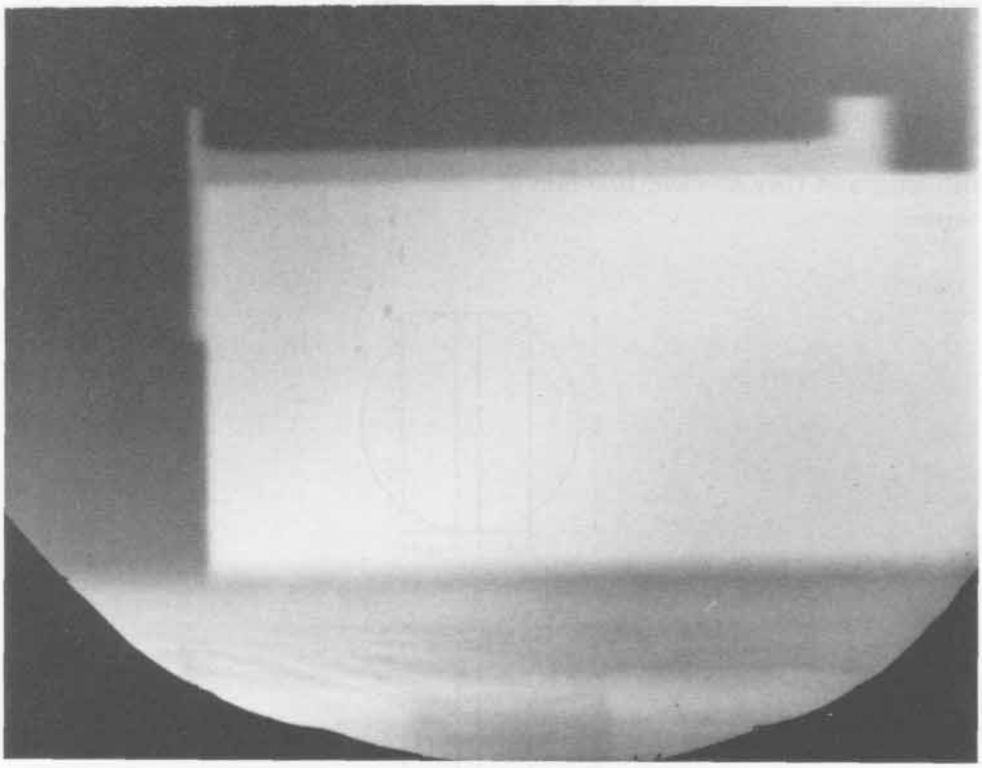


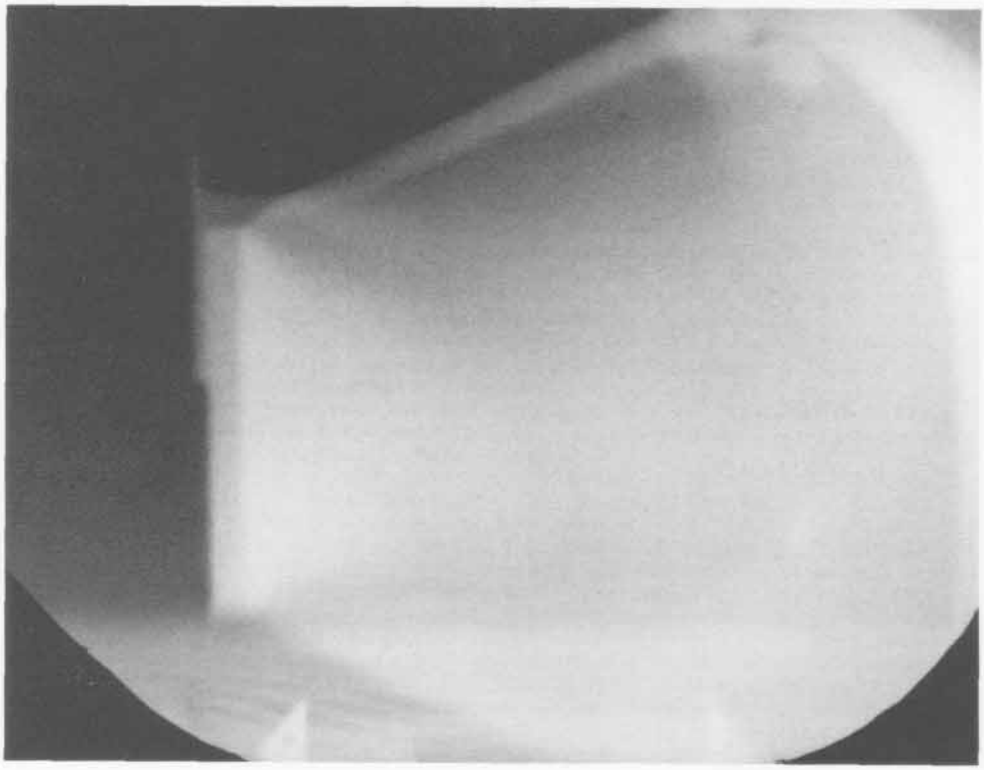


SHOT 1739: **Oblique Shock in Water**
Date: January 4, 1977
Experimenter: Timothy R. Neal
Radiographic Time: 25.85 μs

An oblique shock in 5.0-mm-thick water was driven by 50.8 mm of Composition B-3 initiated by a P-040 lens. See also Shot 1629.

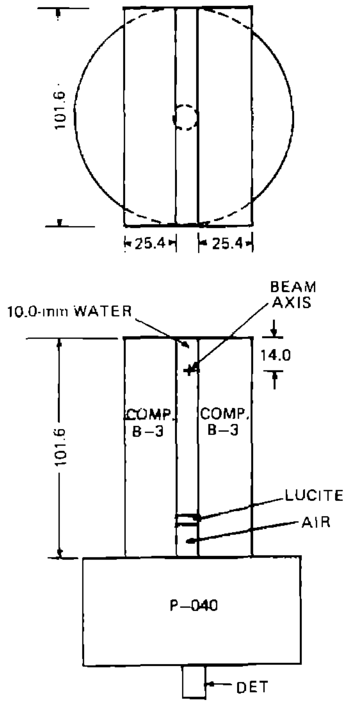


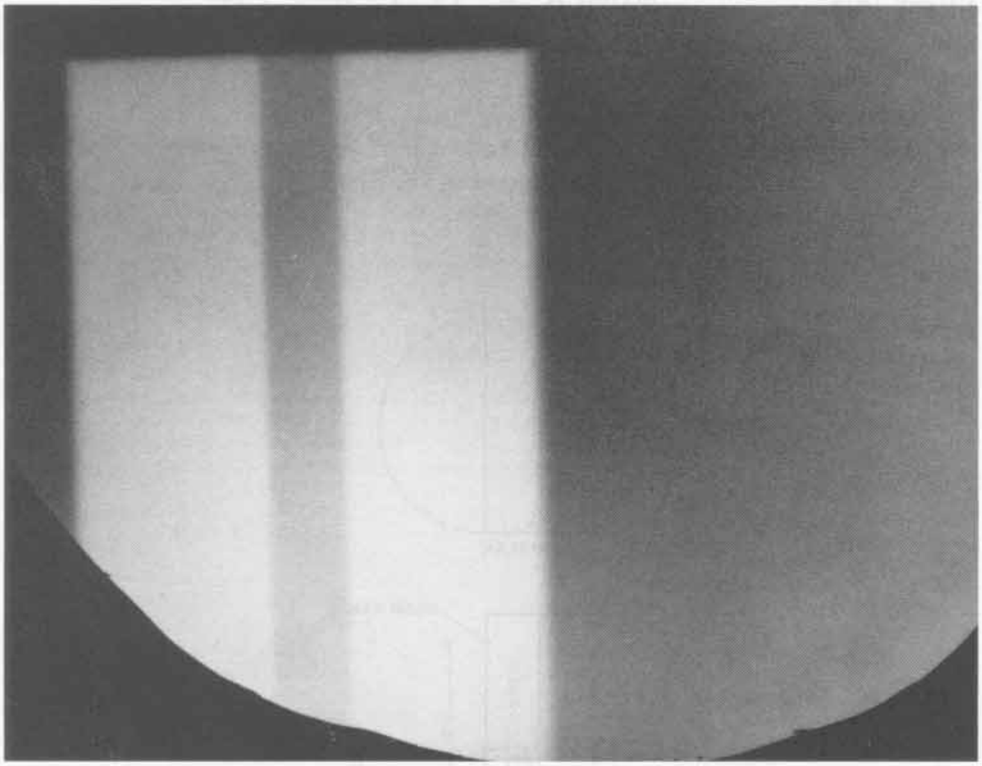


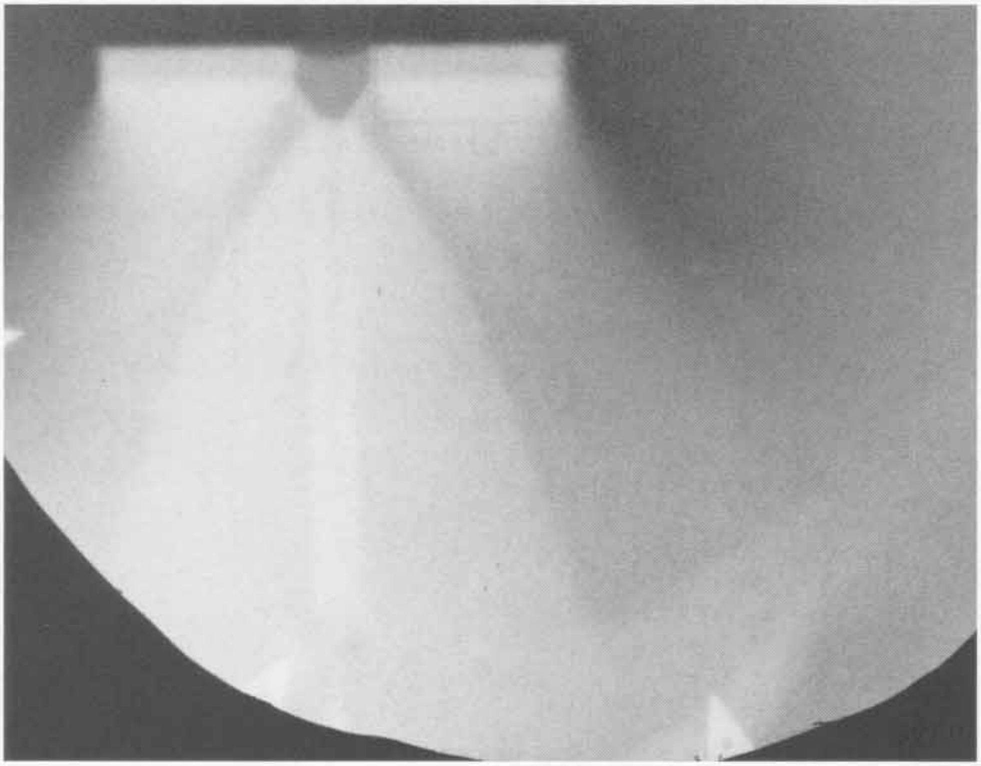


SHOT 1740: **Mach Reflection in Water**
Date: January 4, 1977
Experimenter: Timothy R. Neal
Radiographic Time: 25.84 μs

Two 25.4-mm-thick Composition B-3 slabs were initiated simultaneously by a P-040 lens, and they shocked 10.0 mm of water. A Mach reflection occurred in the water.

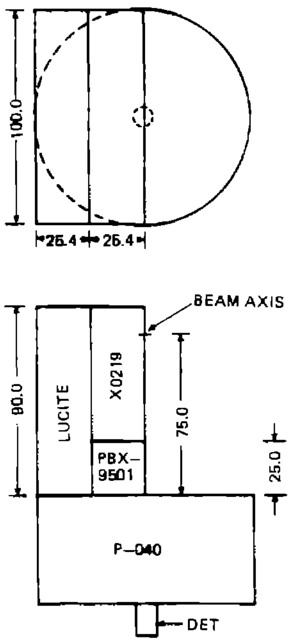


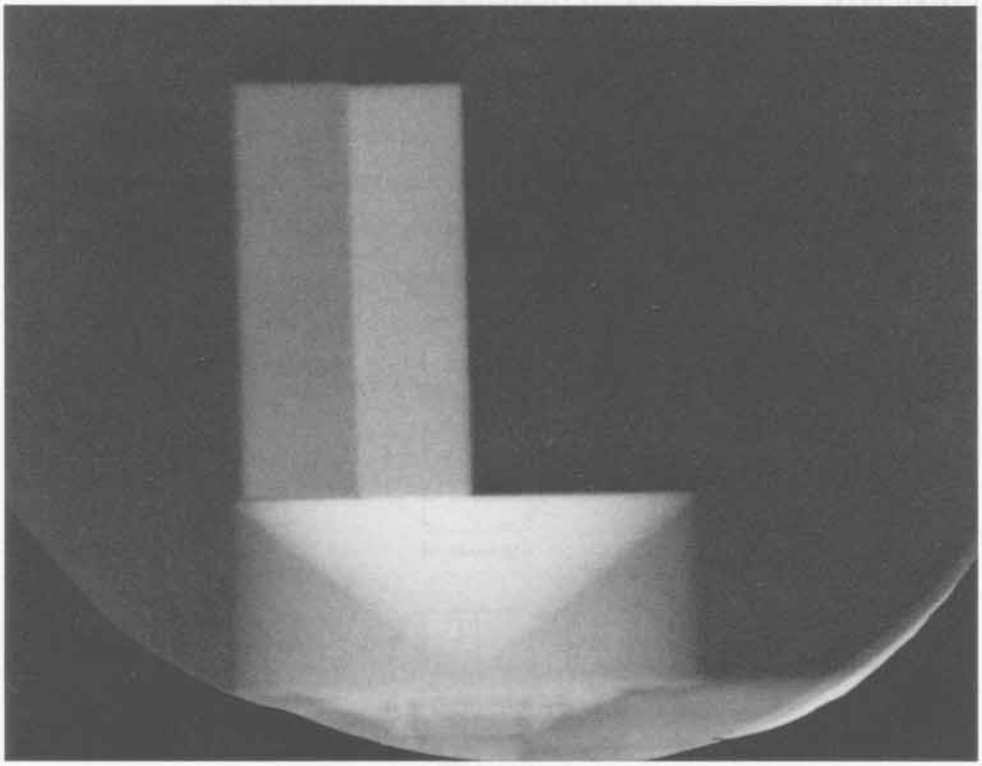


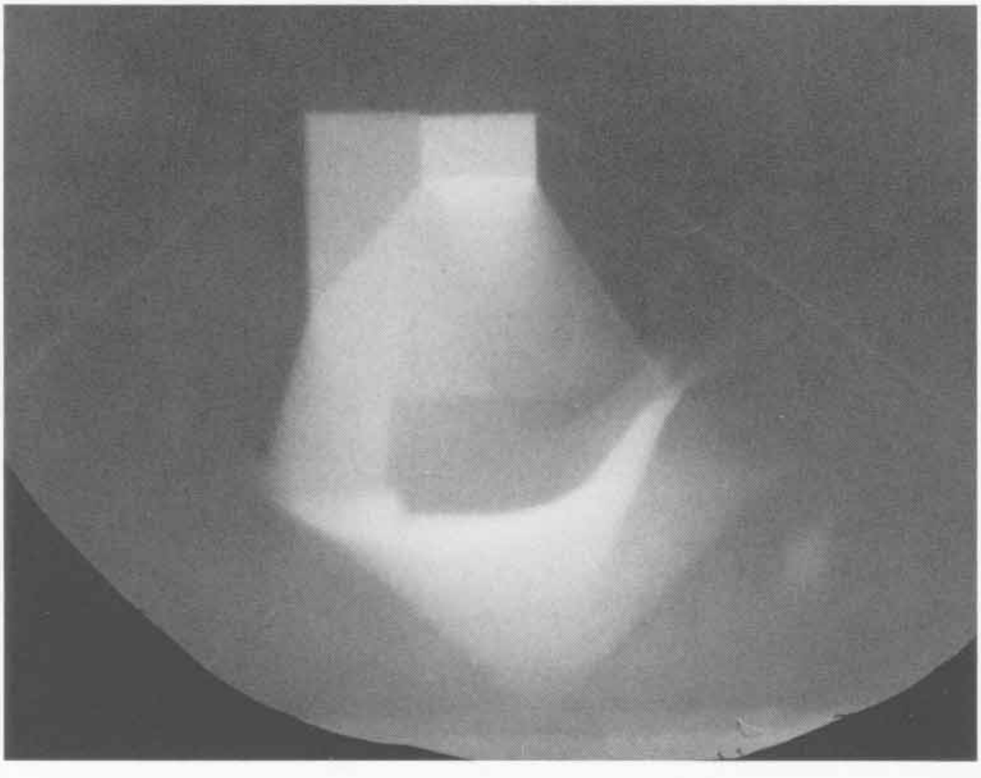


SHOT 1743: **TATB Confined by Lucite and Air**
Date: November 30, 1976
Experimenter: Richard D. Dick
Radiographic Time: 23.30 μs

An X0219 (90/10 wt% TATB/Kel-F at 1.914 g/cm^3) detonation wave overdriven by 25.0 mm of PBX-9501 and a P-040 lens was confined by a 25.4-mm-thick Lucite plate. See also Shot 1744.

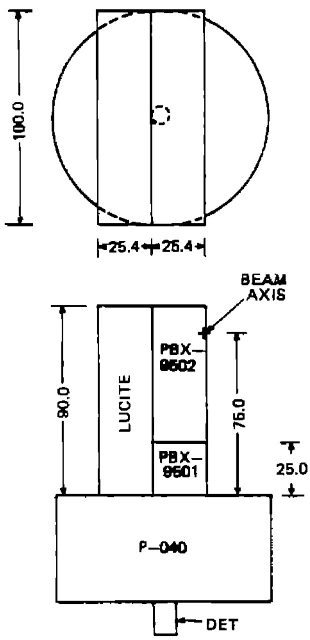


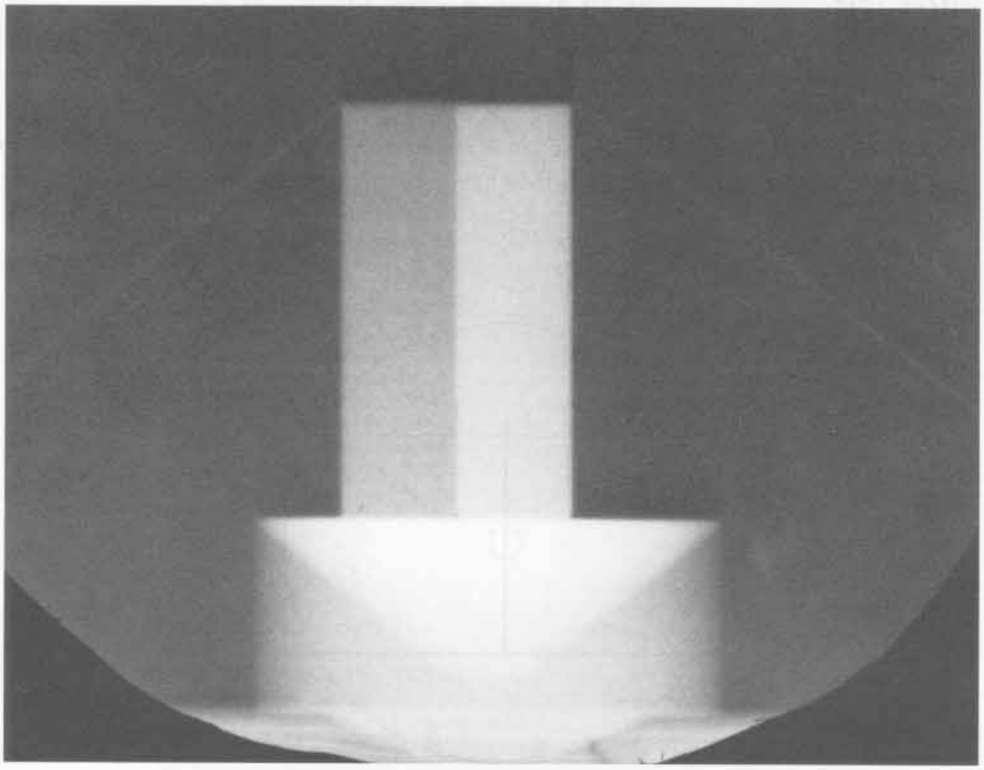


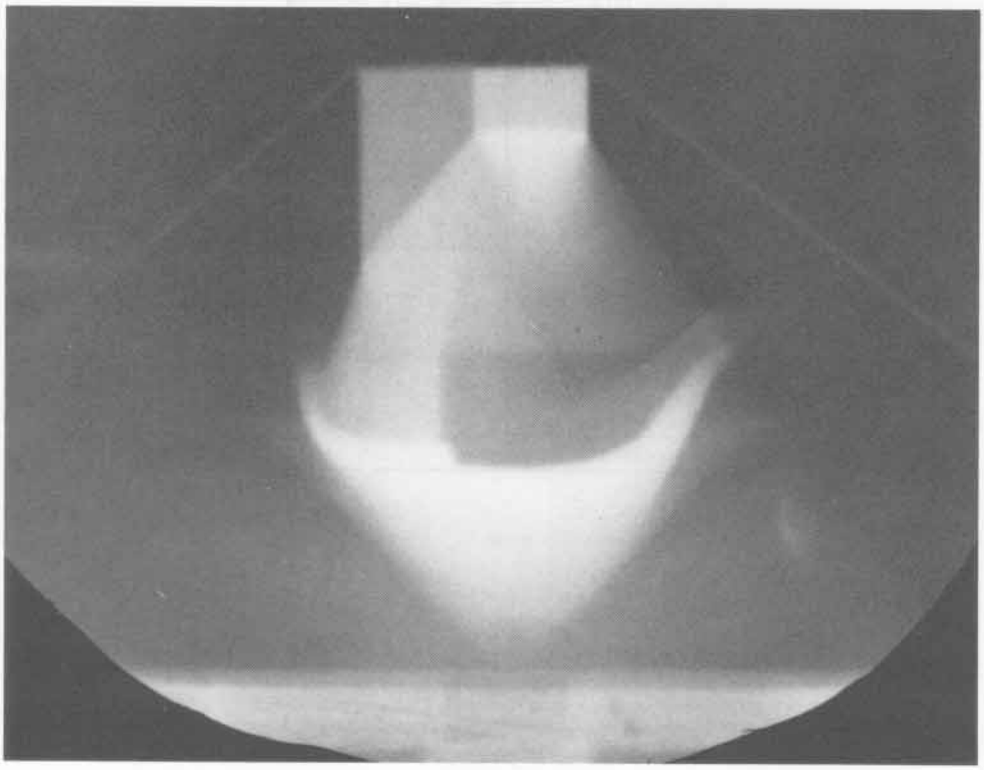


SHOT 1744: **TATB Confined by Lucite and Air**
Date: November 30, 1976
Experimenter: Richard D. Dick
Radiographic Time: 23.20 μs

A PBX-9502 (95/5 wt% TATB/Kel-F at 1.894 g/cm³) detonation wave overdriven by 25.0 mm of PBX-9501 and a P-040 lens was confined by a 25.4-mm-thick Lucite plate. See also Shot 1743.

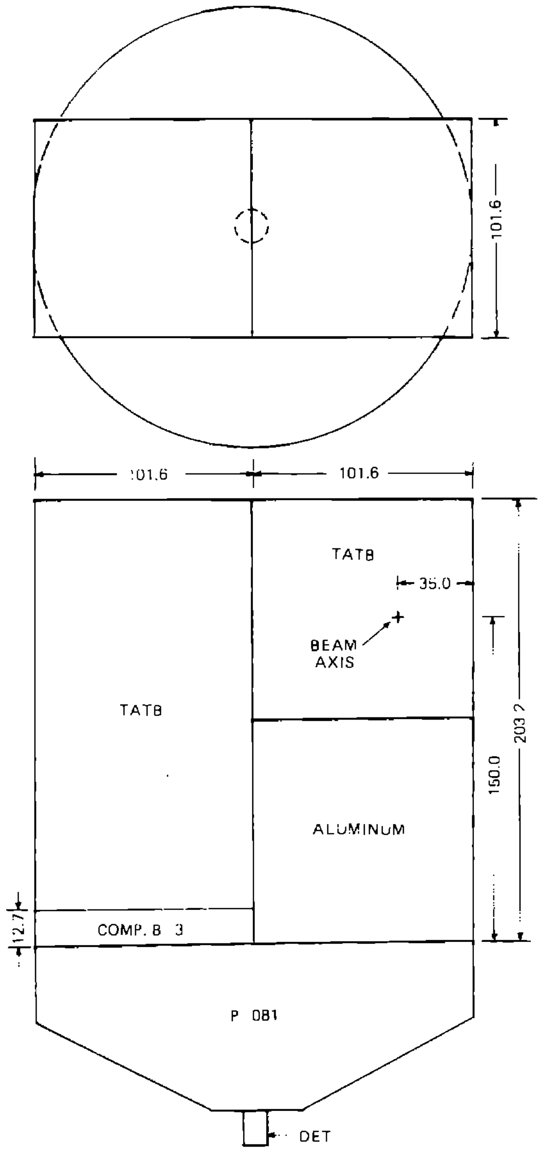


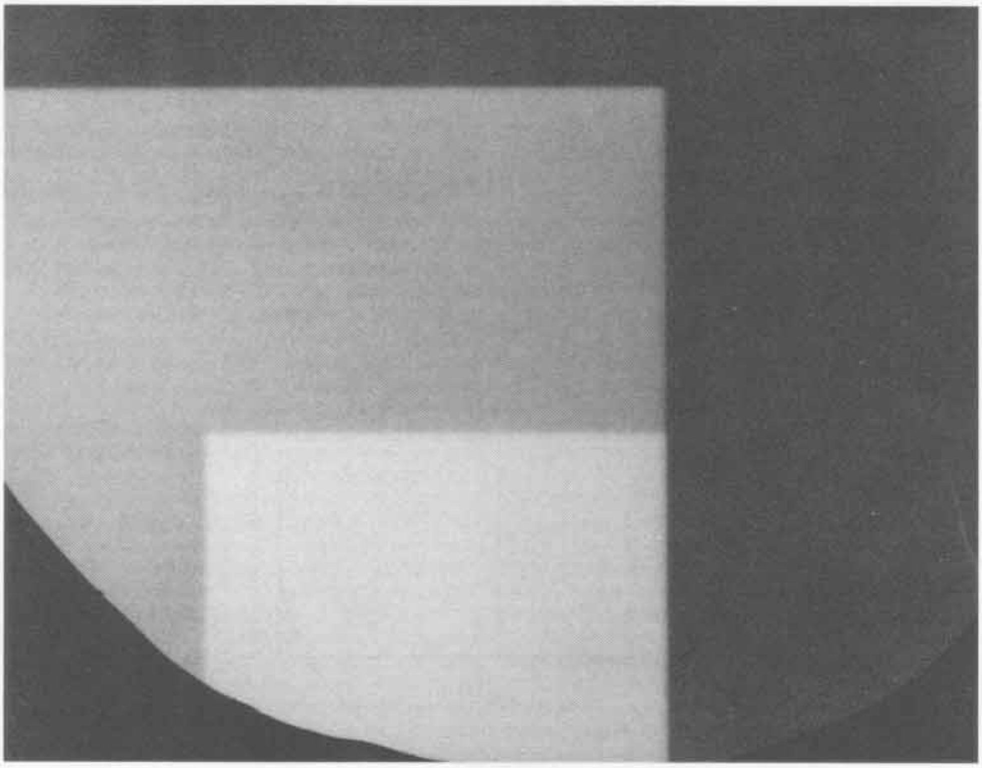


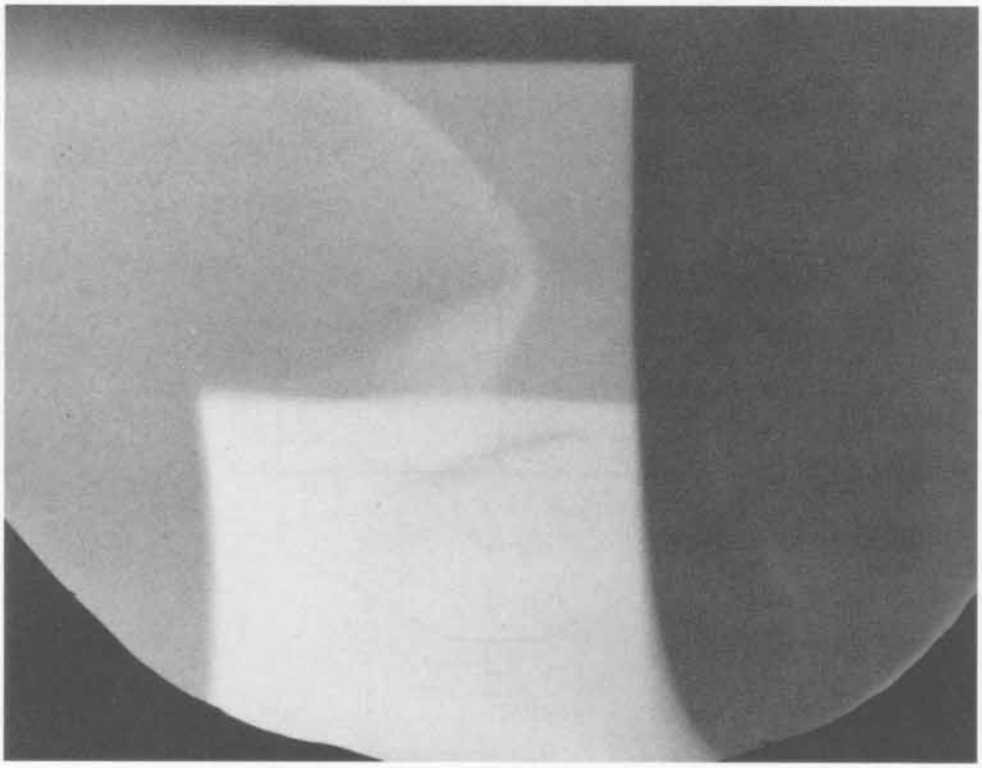


SHOT 1745: **TATB Turning a 90° Aluminum Corner**
Date: January 11, 1977
Experimenter: Richard D. Dick
Radiographic Time: 47.14 μs

An X0219 (90/10 wt% TATB/Kel-F at 1.914 g/cm[3]) detonation wave initiated by 12.7 mm of Composition B-3 and a P-081 lens turned an embedded aluminum corner. See also Shot 1699.







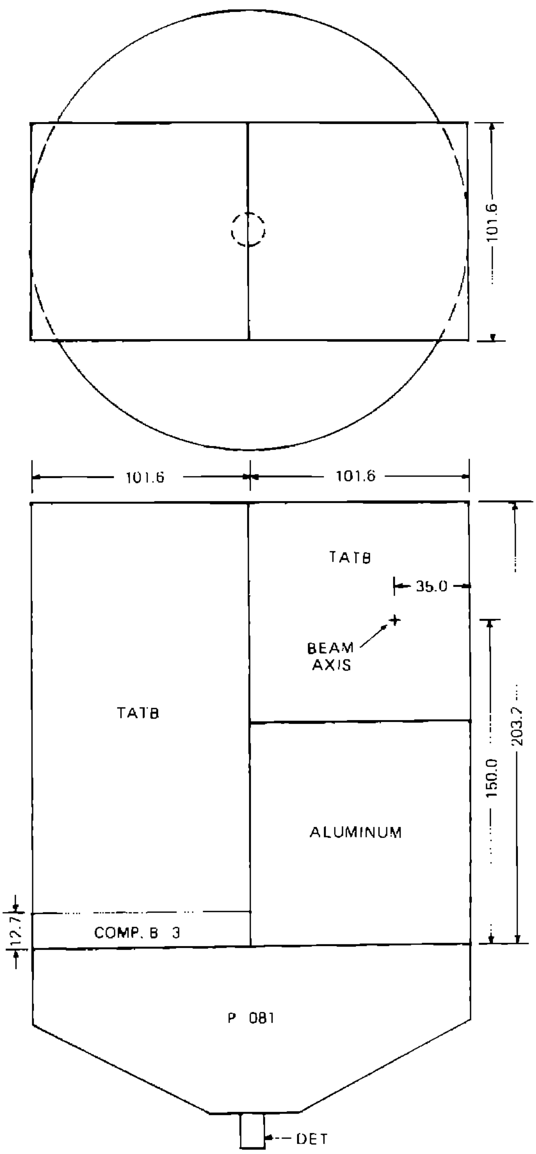
SHOT 1746: **TATB Turning a 90° Aluminum Corner**

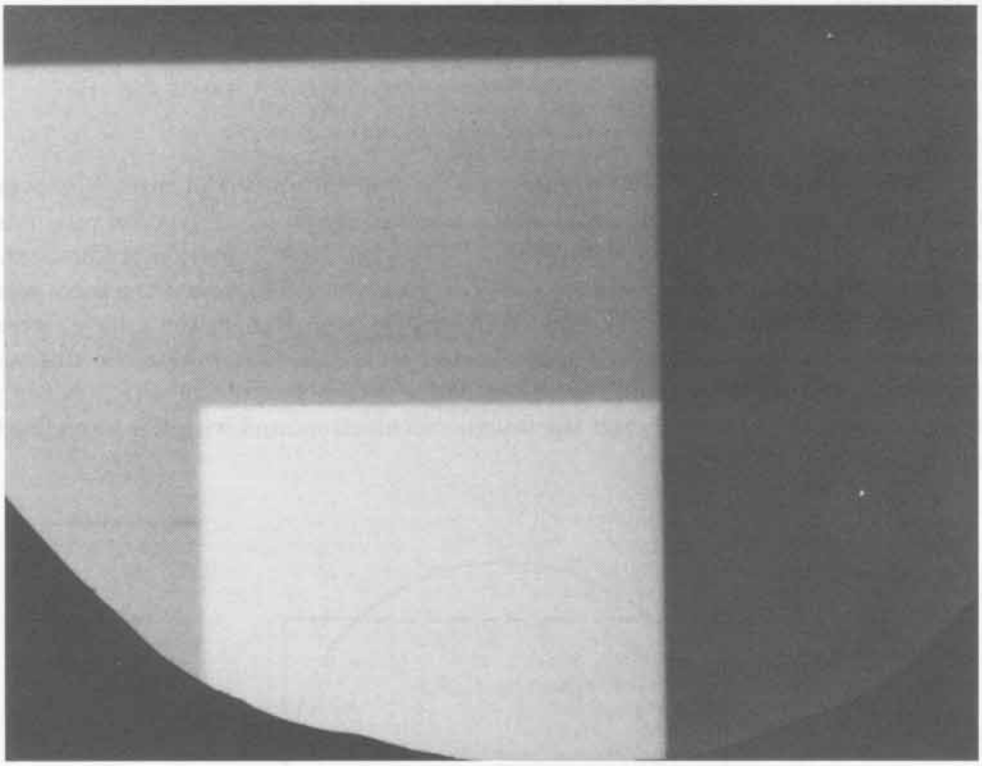
Date: January 11, 1977

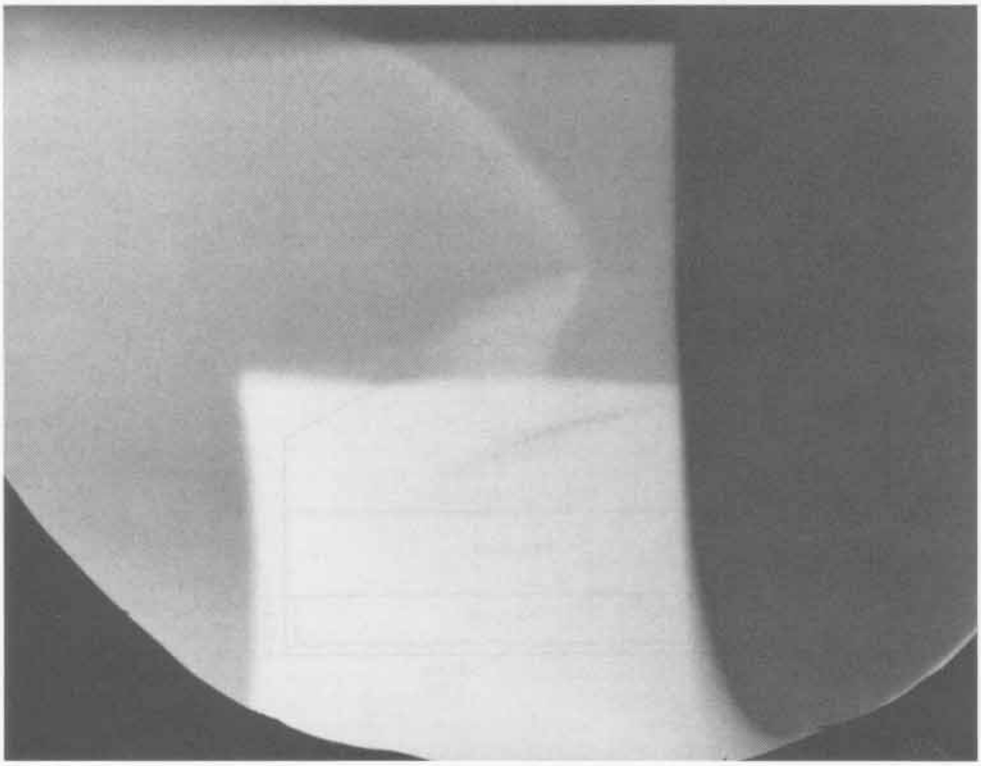
Experimenter: Richard D. Dick

Radiographic Time: 46.85 μs

A PBX-9502 (95/5 wt% TATB/Kel-F at 1.894 g/cm^3) detonation wave initiated by 12.7 mm of Composition B-3 and a P-081 lens turned an embedded aluminum corner. See also Shot 1700.

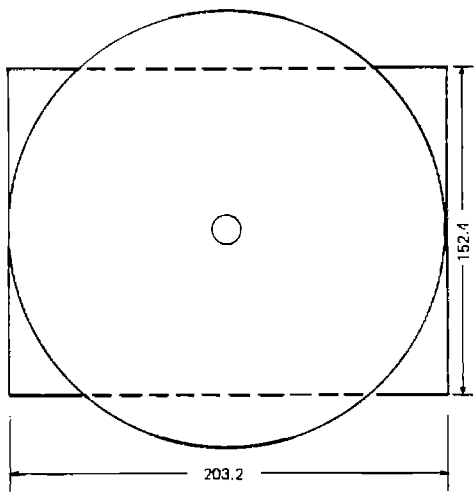


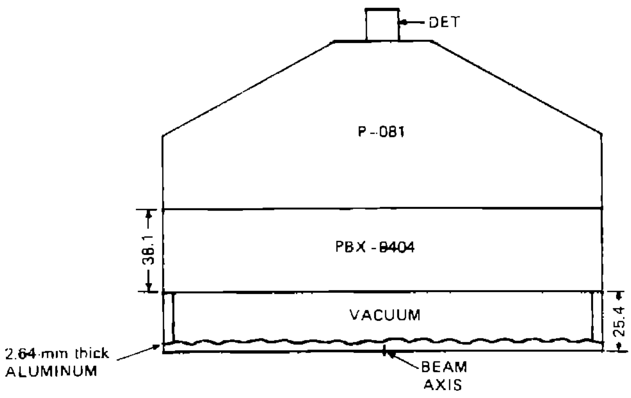


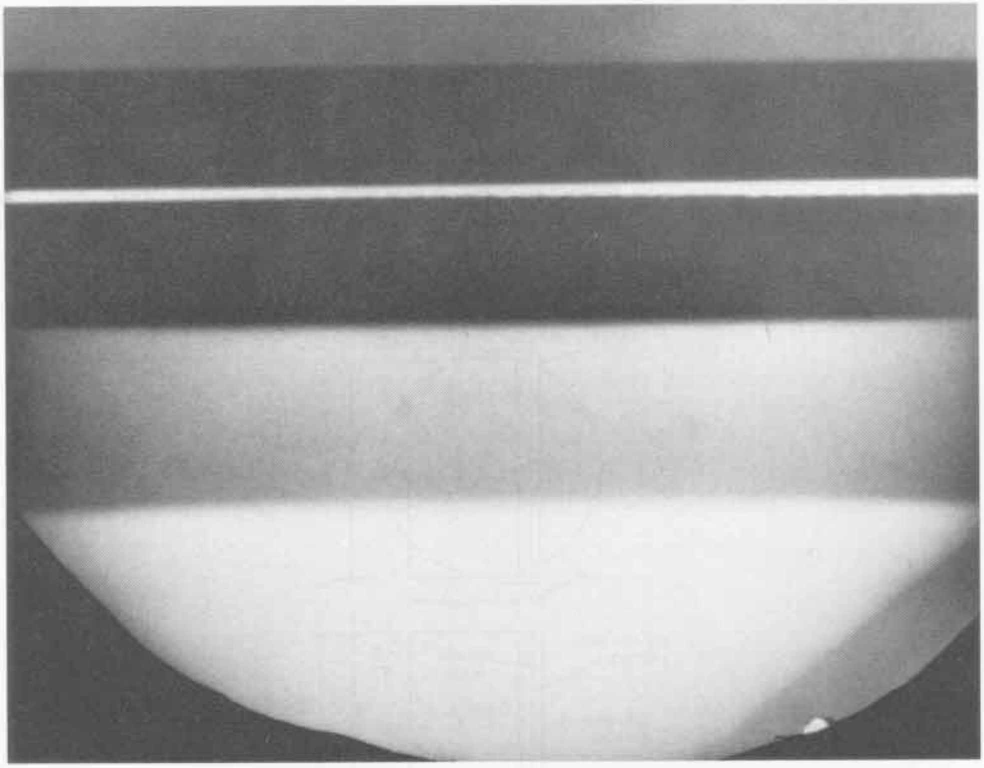


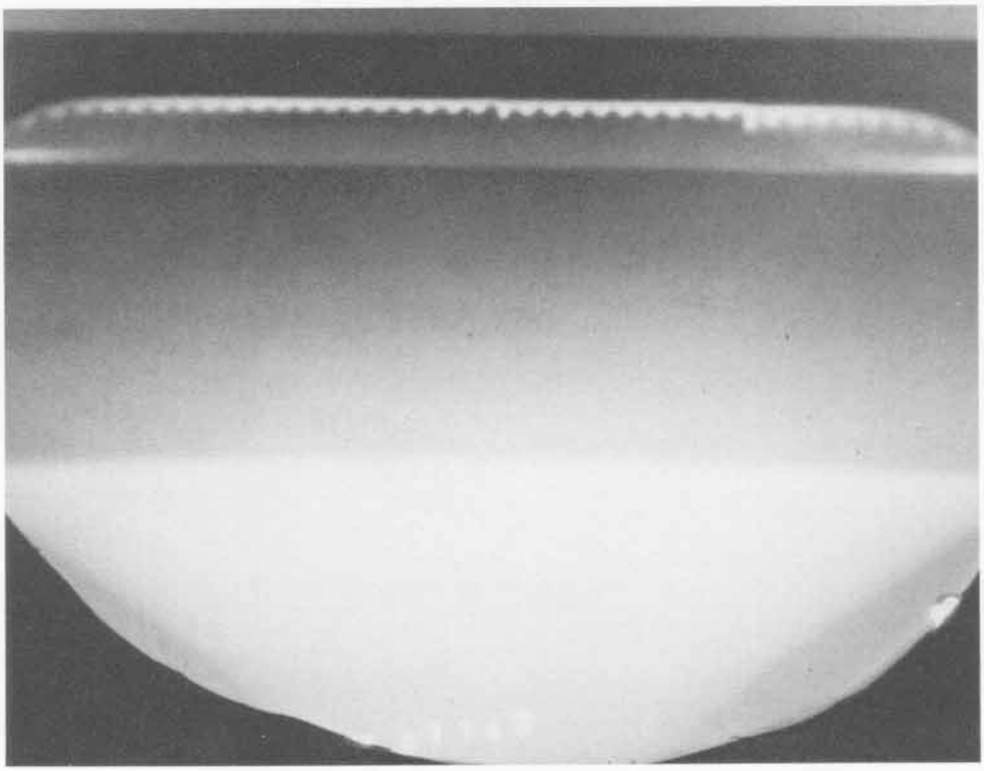
SHOT 1776: **Taylor Instability in Aluminum**
Date: February 15, 1977
Experimenter: Roger K. London
Radiographic Time: 34.99 μs
Reference: Barnes et al., 1974

A 2.64-mm-thick plate of 1100 aluminum with uniform sinusoidal surface grooves 0.203-mm deep and a wavelength of 5.08 mm was driven by detonation products from 38.1 mm of PBX-9404 initiated by a P-081 lens. The detonation products expanded 25.4 mm in a vacuum for 8.0 μs. The observed amplitude of the wave was 1.51 mm. This shot closely reproduced Shot 1342 even though the grooves were divided into four equal sections with varying surfaces. The first section had an electroplated 0.05-mm-thick gold film; the second, electroplated nickel with 30% iron; the third was left uncoated; and the fourth was electroplated with hard-anodized aluminum.



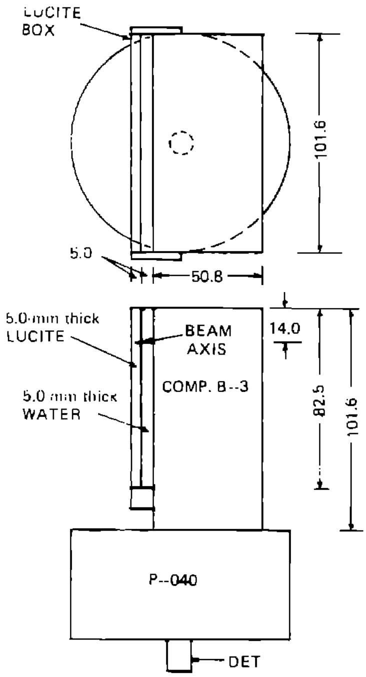


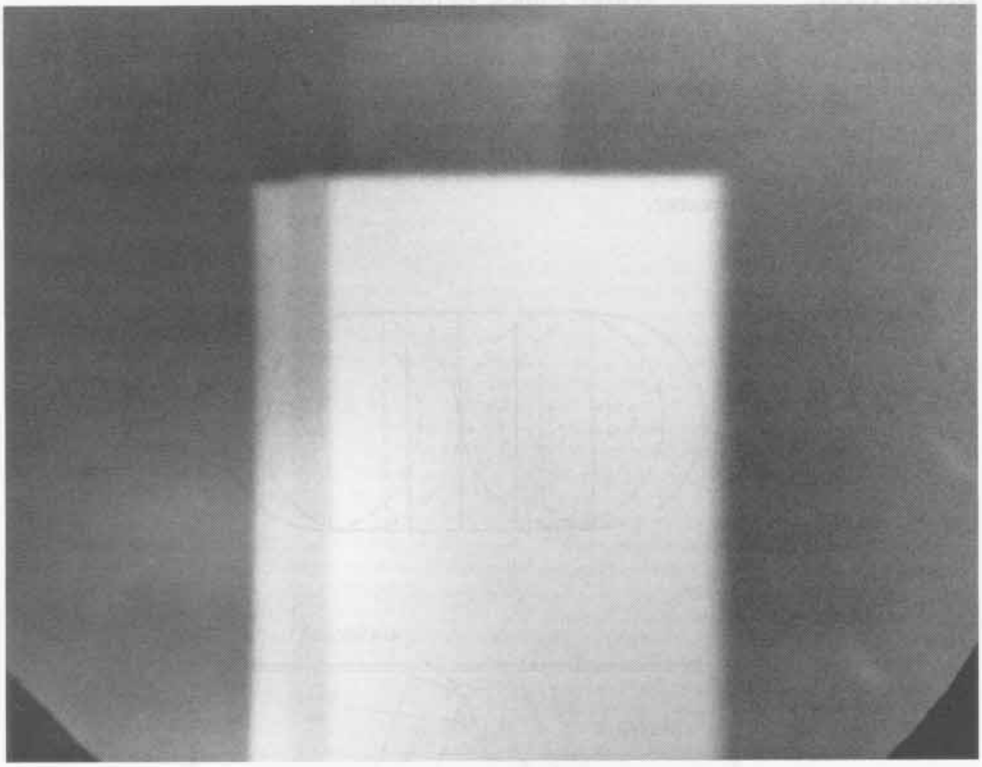


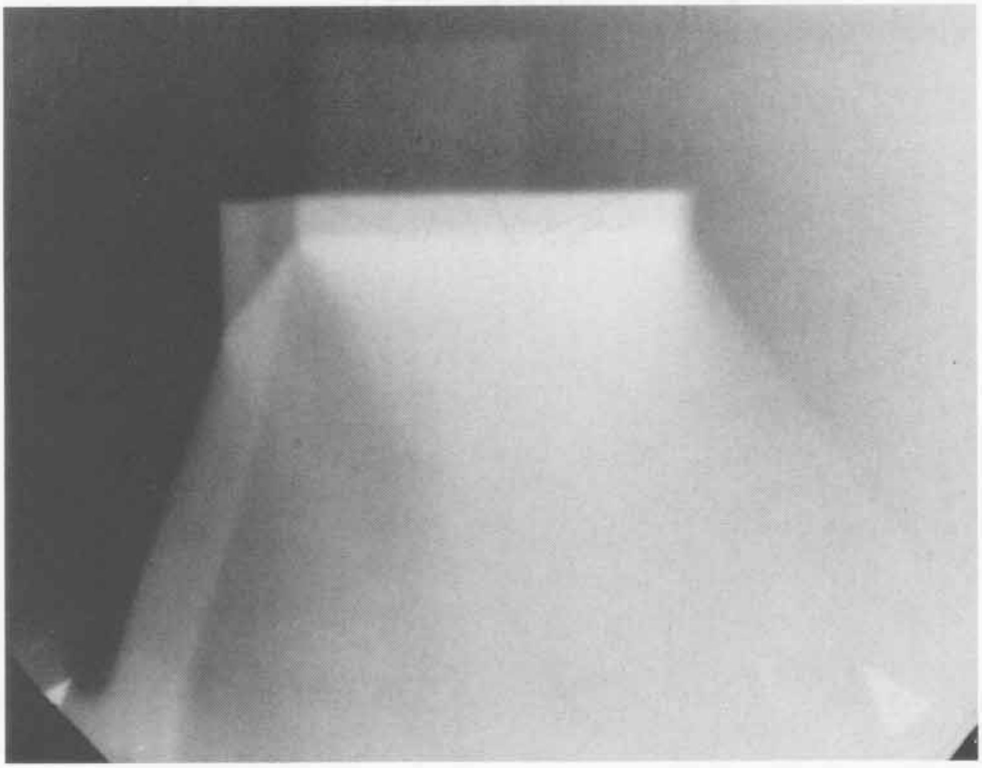


SHOT 1778: **Oblique Shocks in Water**
Date: January 12, 1977
Experimenter: Timothy R. Neal
Radiographic Time: 25.83 μs

An oblique shock in 5.0-mm-thick water was driven by 50.8 mm of Composition B-3 initiated by a P-040 lens and reflected from a 5.0-mm-thick Lucite plate. See also Shot 1737.







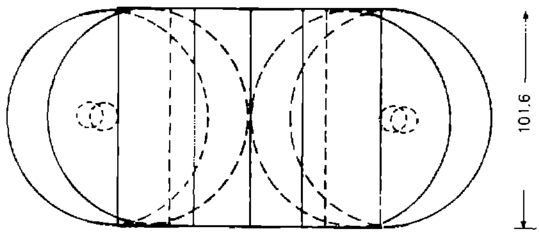
SHOT 1779: **Water Shock Reflection**

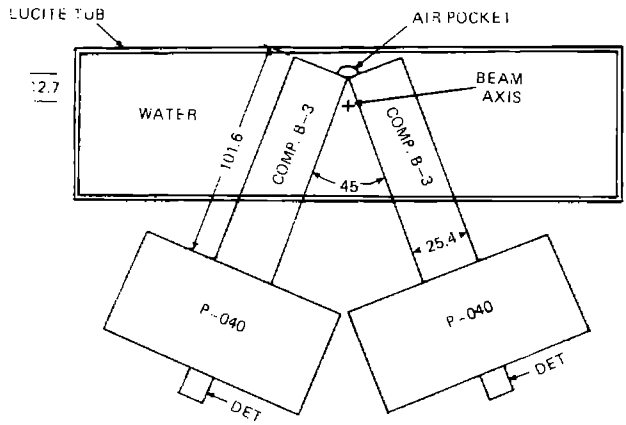
Date: January 12, 1977

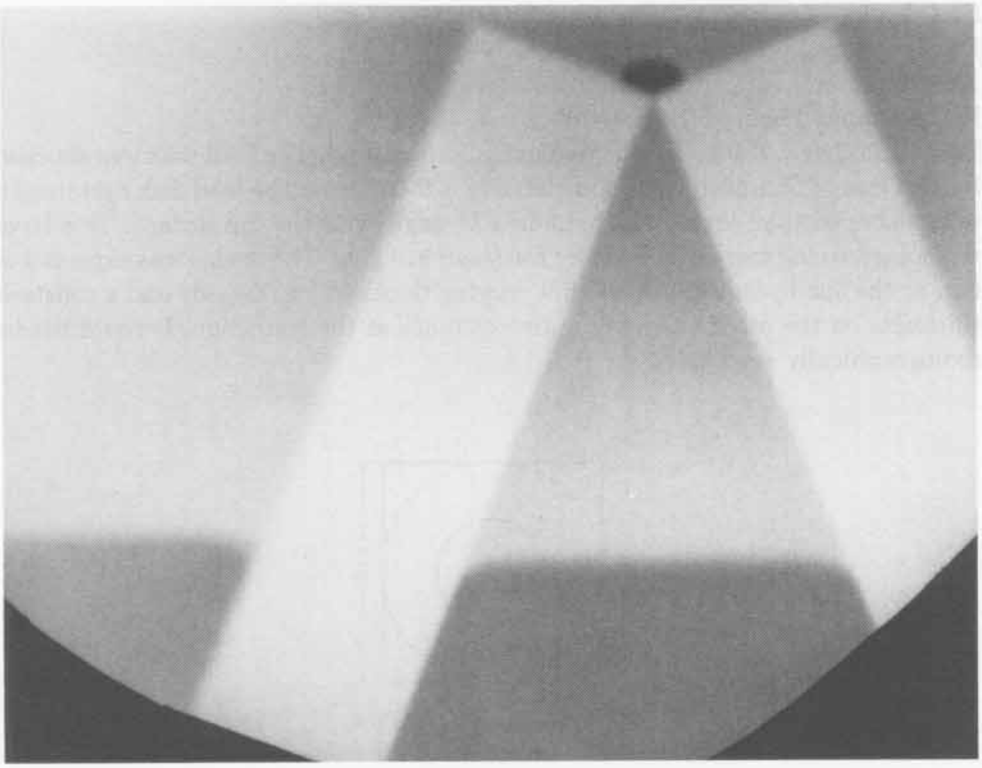
Experimenter: Timothy R. Neal

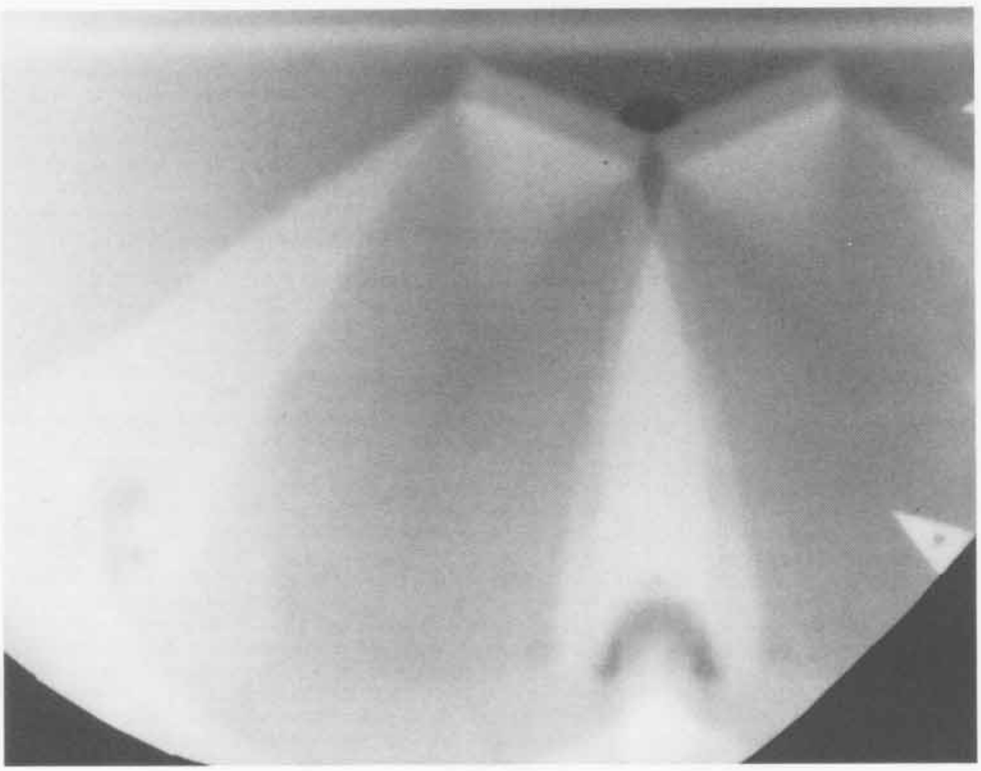
Radiographic Time: 25.79 μs

Two 101.6-mm Composition B-3 slabs 45° apart and simultaneously initiated by two P-040 lenses shocked the water in which they were immersed. A shock reflection occurred in the water.



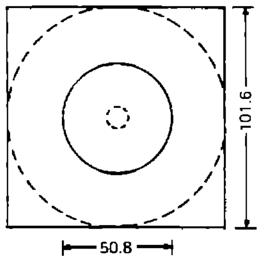


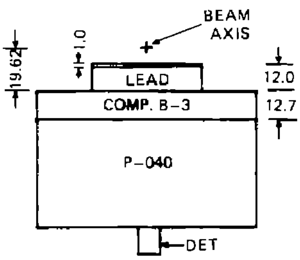


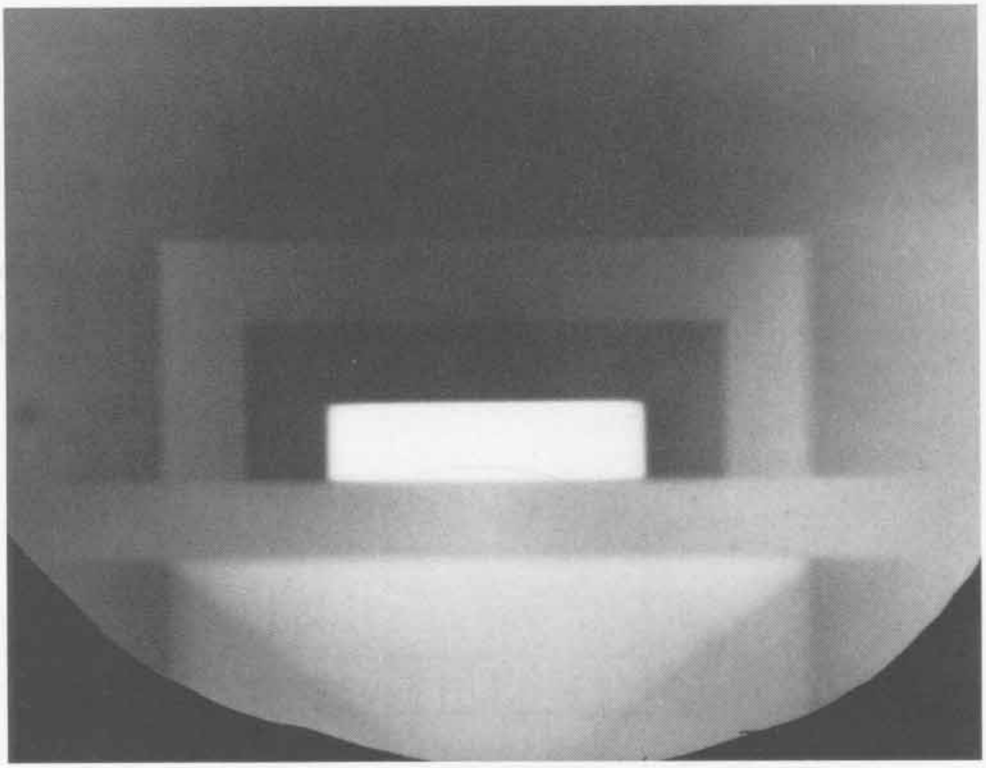


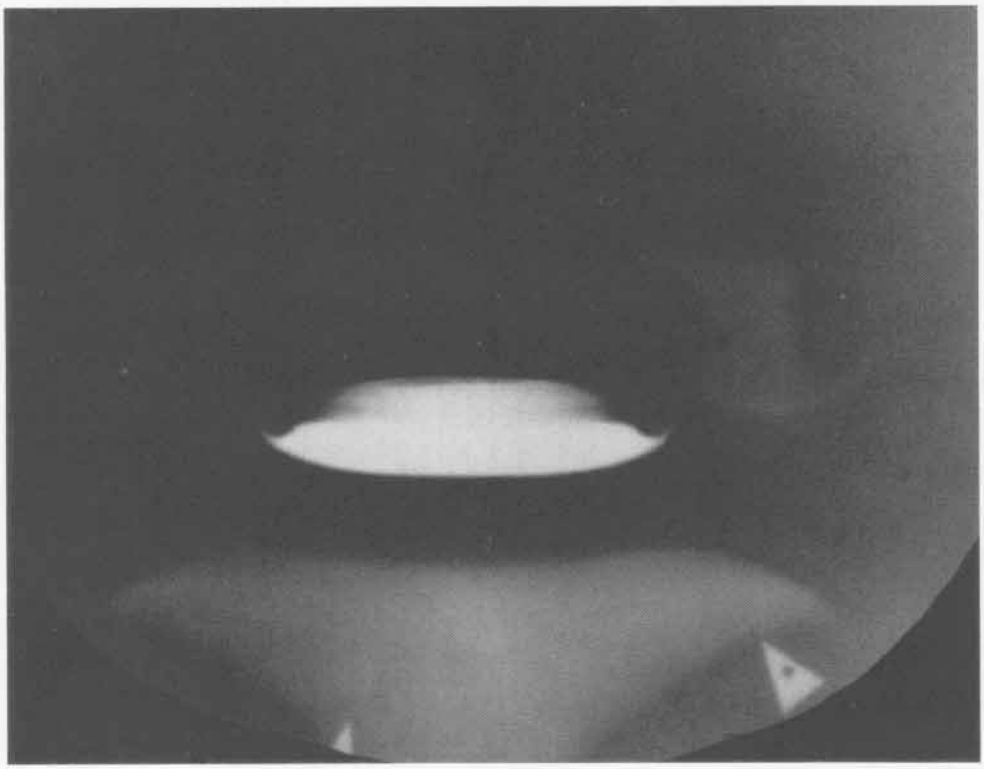
SHOT 1780: **Dynamic Fracture of Lead**
Date: January 26, 1977
Experimenter: Timothy R. Neal
Radiographic Time: 25.47 μs

Lead of 12.7-mm thickness was dynamically fractured. The lead disk was shocked by 12.7 mm of Composition B-3 initiated by a P-040 lens. The lead disk contained a wedge-shaped spall layer, which made a 1° angle with the top surface. This layer was joined to the rest of the lead by Eastman 910 glue. The wedge was expected to tear at the spall plane and to exhibit varying thickness on one side and a constant thickness on the other side with a discontinuity at the transition. It could not be radiographically resolved.



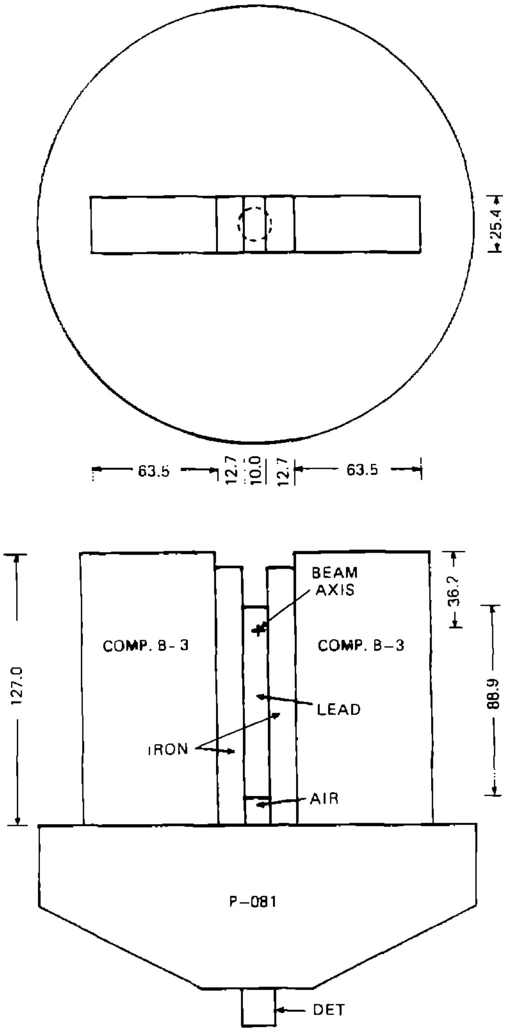


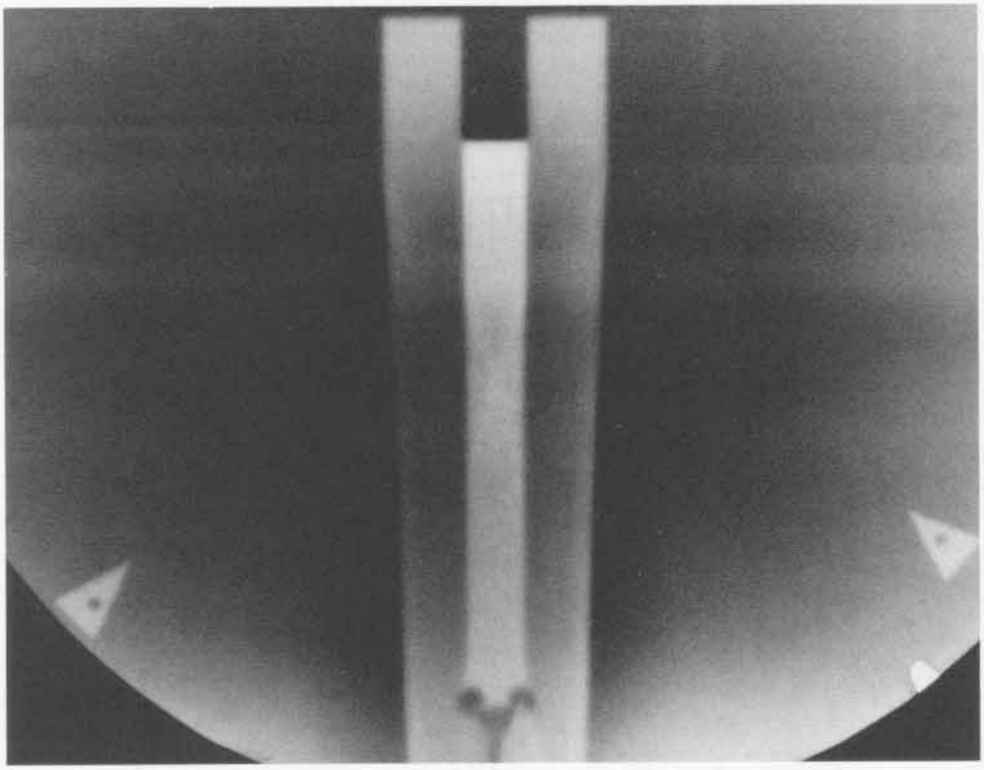




SHOT 1781: **Lead Regular Shock Reflection**
Date: January 26, 1977
Experimenter: Timothy R. Neal
Radiographic Time: 37.85 μs

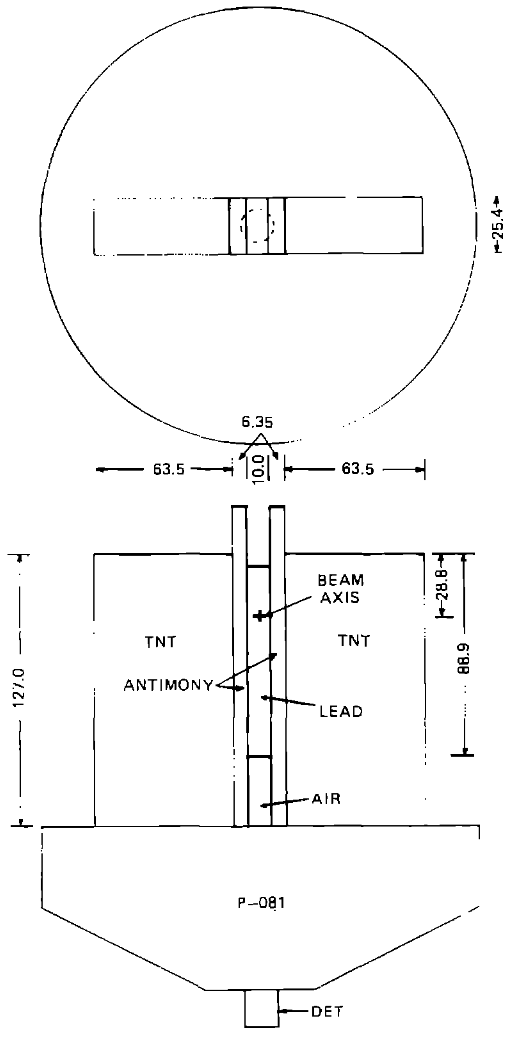
To obtain regular shock reflection in lead with minimum pressure gradients, two 127.0-mm-high blocks of Composition B-3 were simultaneously initiated by a P-081 lens. They obliquely shocked embedded layers of 12.7-mm-thick Armco iron, 10-mm-thick lead, and 12.7-mm-thick Armco iron. See also Shot 1782.

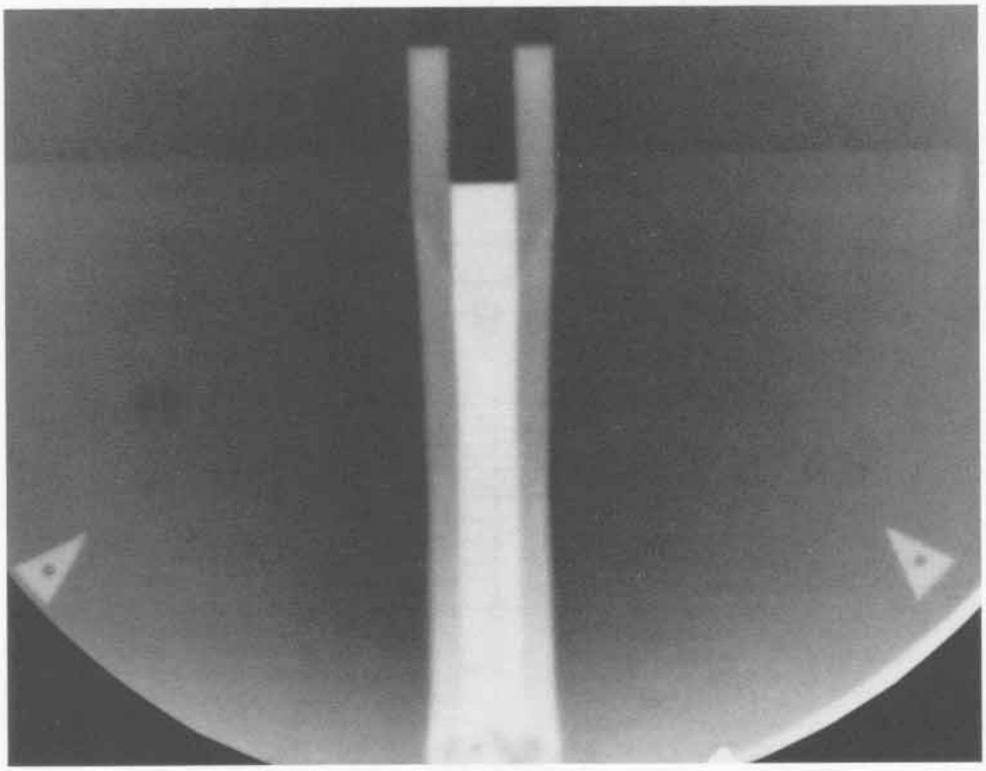




SHOT 1782: **Lead Regular Shock Reflection**
Date: January 26, 1977
Experimenter: Timothy R. Neal
Radiographic Time: 39.92 μs

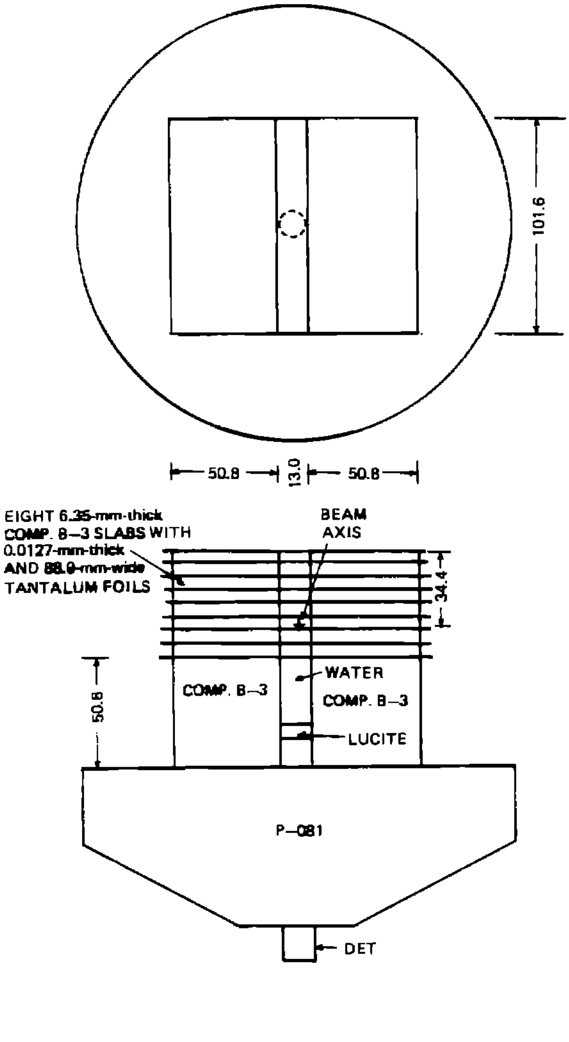
To obtain regular reflection in lead with minimum pressure gradients, two 127.0-mm-high blocks of TNT were simultaneously initiated by a P-081 lens. They obliquely shocked embedded layers of 6.35-mm-thick antimony, 10.0-mm-thick lead, and 6.35-mm-thick antimony. See also Shot 1781.

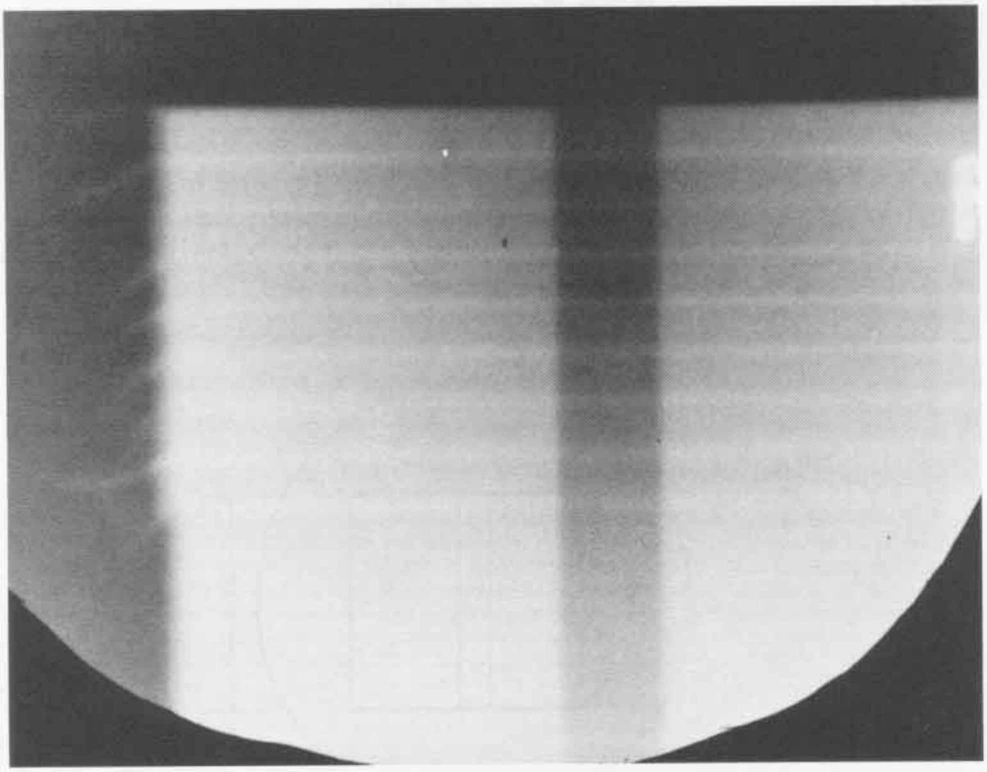


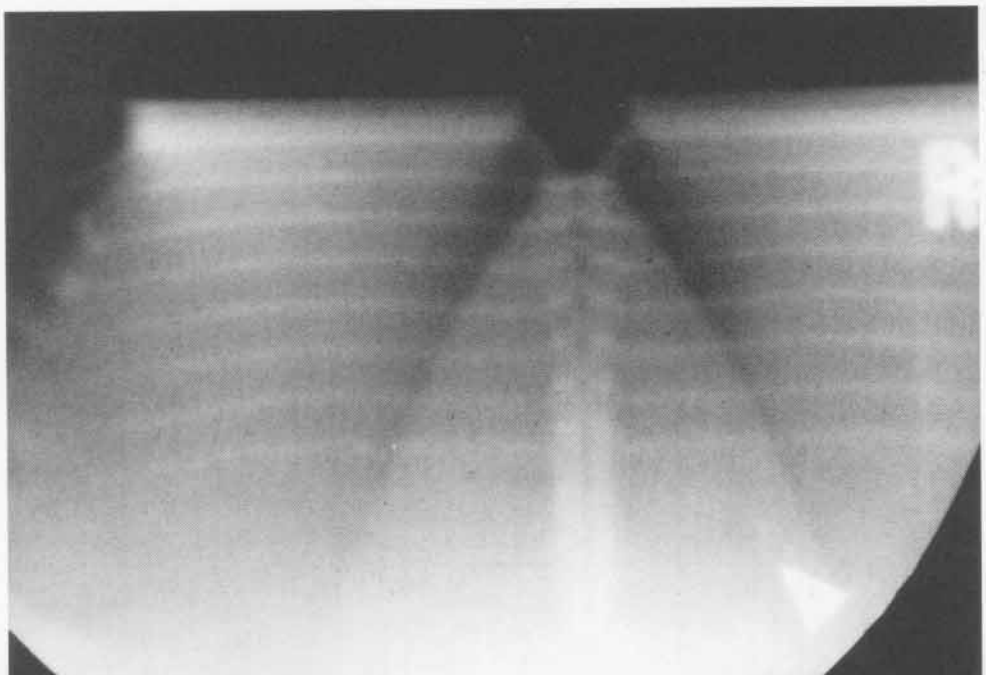


SHOT 1783: **Water Mach Reflection**
Date: February 10, 1977
Experimenter: Timothy R. Neal
Radiographic Time: 35.10 μs

Two 101.6-mm Composition B-3 slabs were simultaneously initiated by a P-081 lens, and shocked 13.0 mm water. Nine 0.0127-mm-thick tantalum foils were located each 6.35 mm in the Composition B-3 and water in the top half of the block.







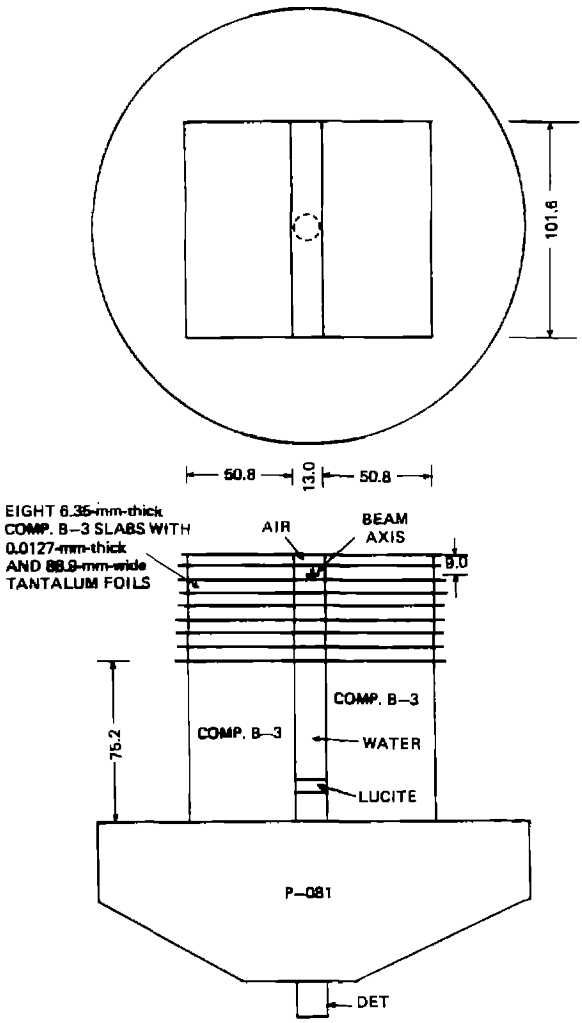
SHOT 1784: **Water Mach Reflection**

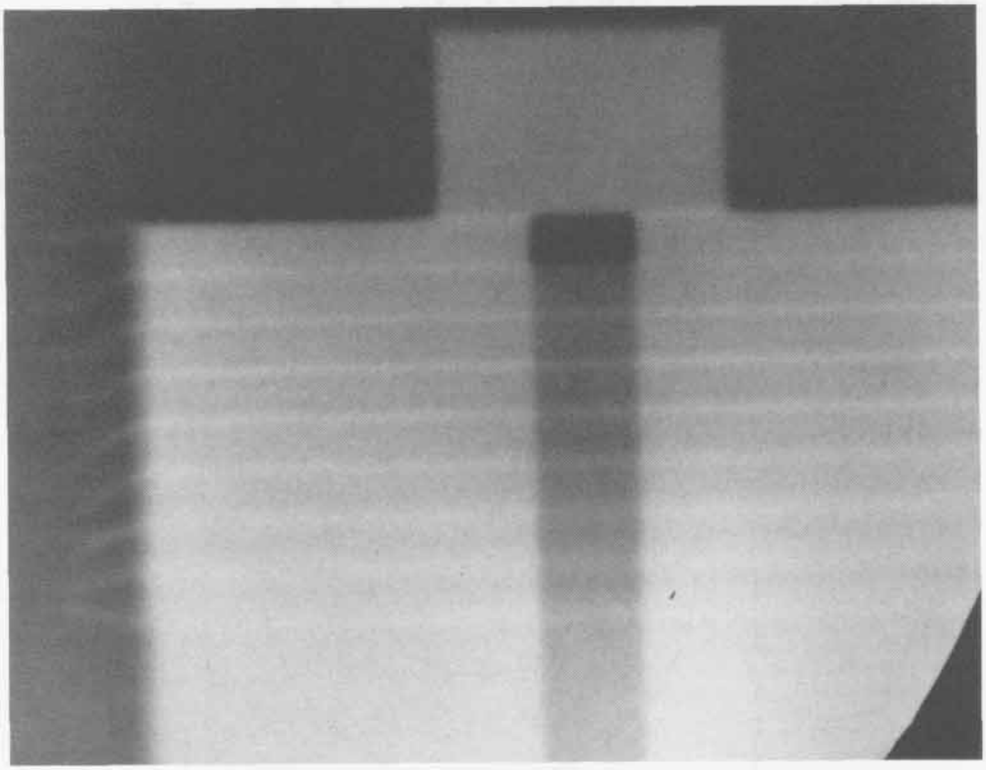
Date: February 2, 1977

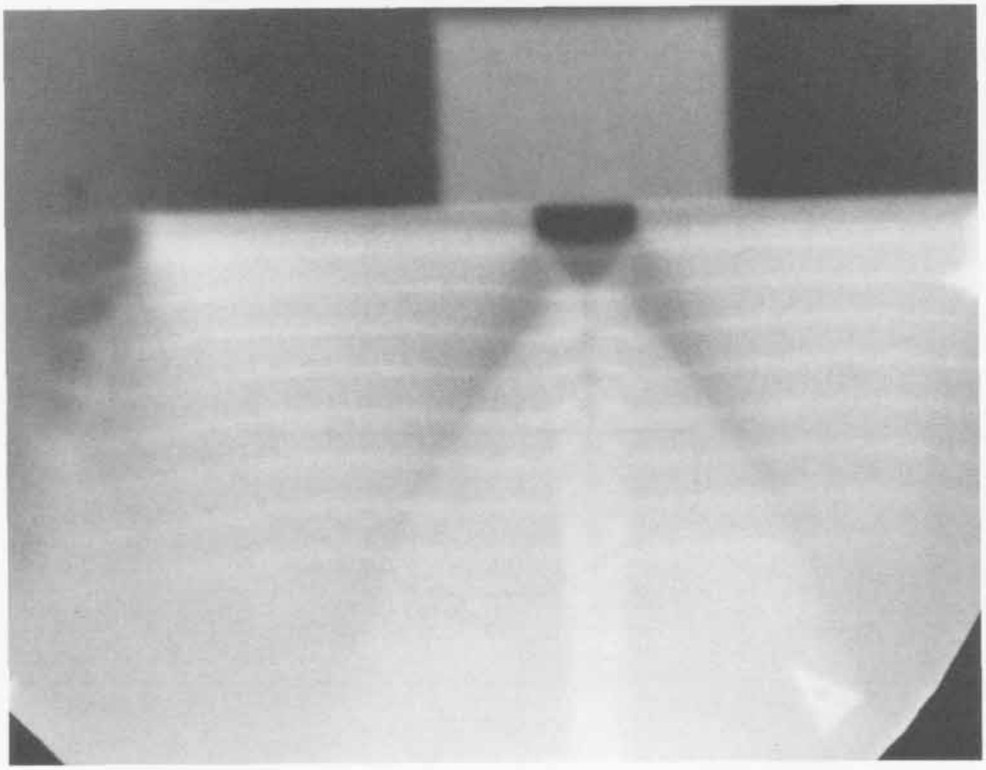
Experimenter: Timothy R. Neal

Radiographic Time: 38.28 μs

Two 127.0-mm Composition B-3 slabs were simultaneously initiated by a P-081 lens, and shocked 13.0 mm of water. A Mach reflection occurred in the water. Nine 0.0127-mm-thick tantalum foils were located each 6.35 mm in the Composition B-3 and water in the top half of the block. The water level was 6.35 mm below the top of the Composition B-3 slab.

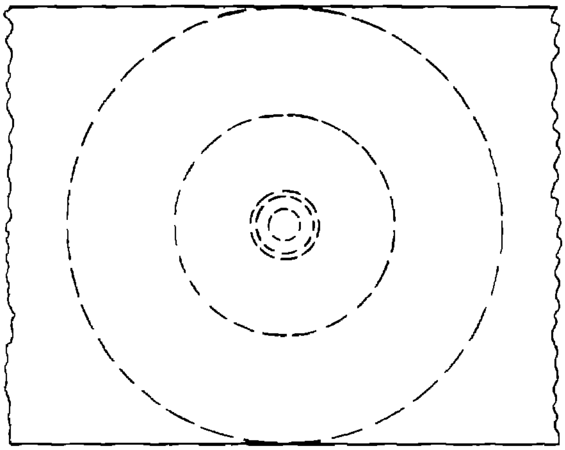


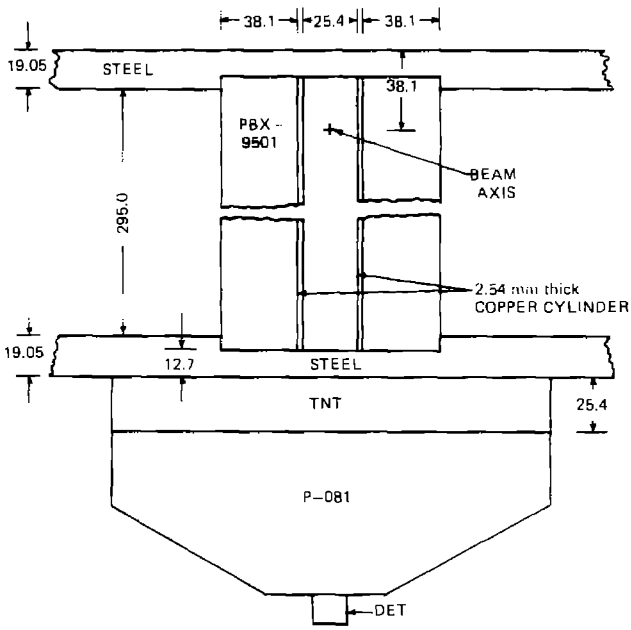


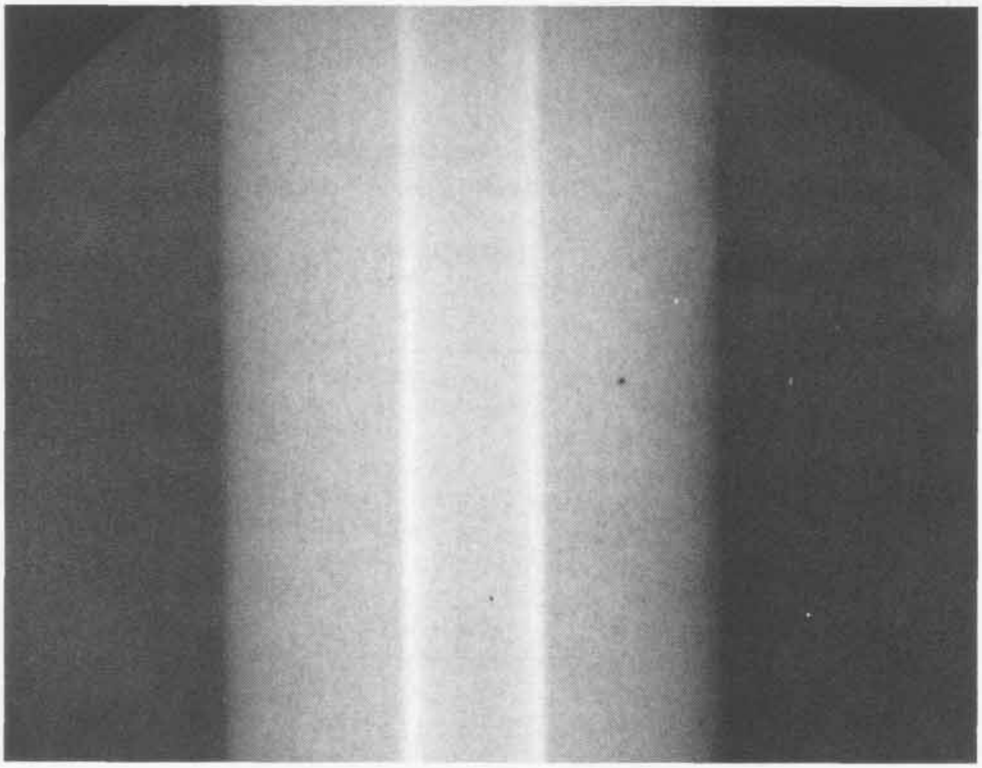


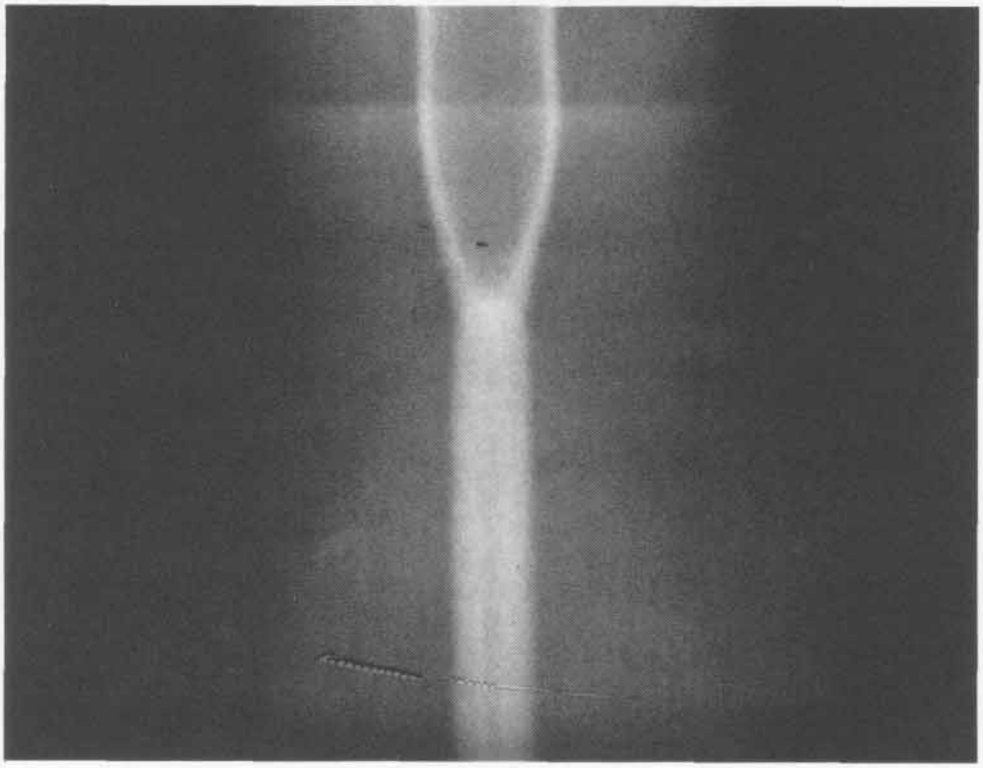
SHOT 1793: **Cylindrical Implosion of a Copper Tube**
Date: August 18, 1977
Experimenter: L. Erik Fugelso
Radiographic Time: 60.45 μs

A 25.4-mm-diameter, 2.54-mm-thick copper tube was surrounded with a 100.0-mm-diameter PBX-9501 cylinder and was initiated by a system of 12.7 mm of 304 stainless steel, 25.4 mm of TNT, and a P-081 lens. The maximum radial velocity was 4.0 mm/μs.









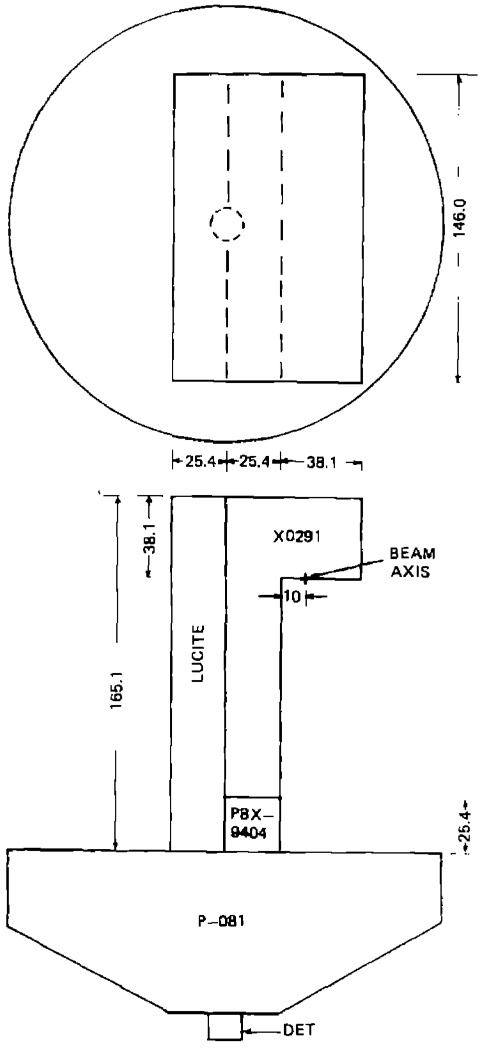
SHOT 1795: **TATB Turning a 90° Corner**

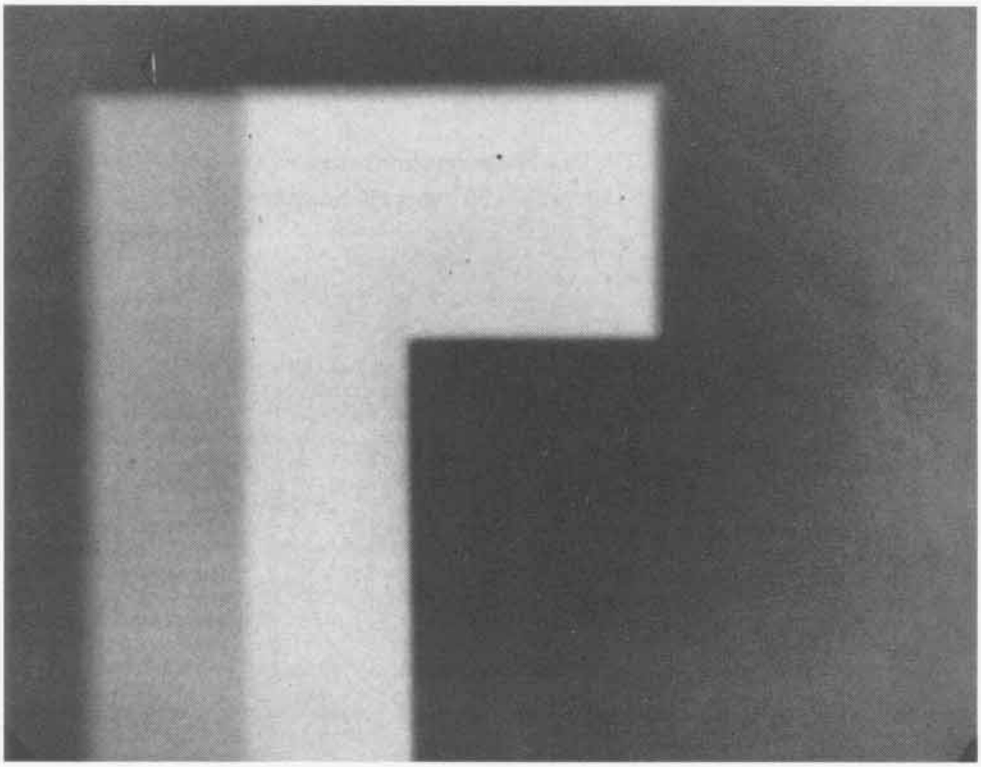
Date: May 24, 1977

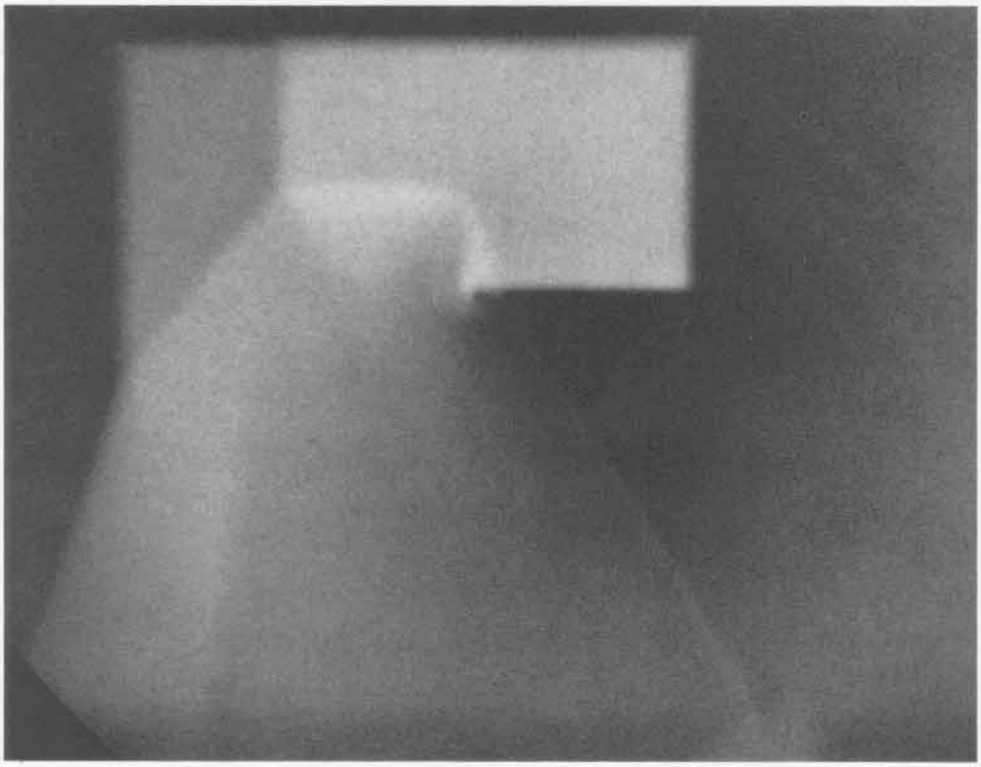
Experimenter: Richard D. Dick

Radiographic Time: 41.80 μs

An X0291 (92.5/7.5 wt% TATB/Kel-F) detonation wave was initiated by 25.4 mm of PBX-9404 and a P-081 lens turning a 90° corner. See also Shots 1796 and 1797.

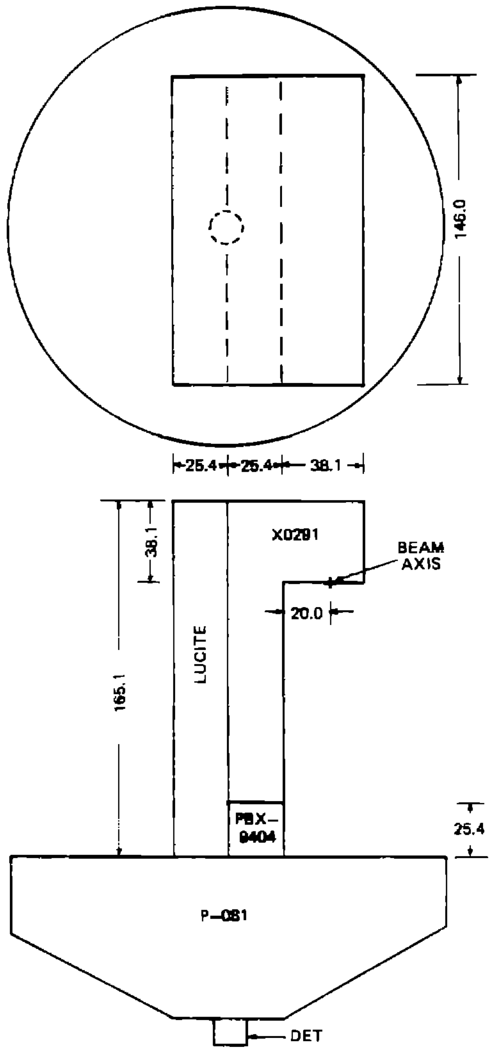


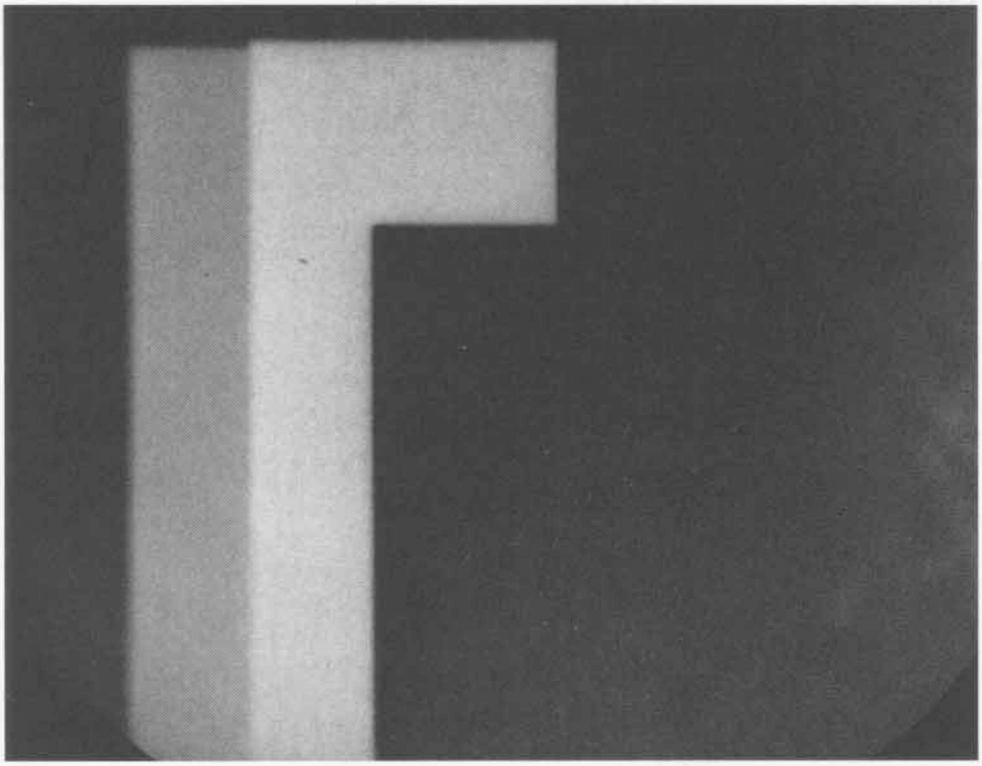


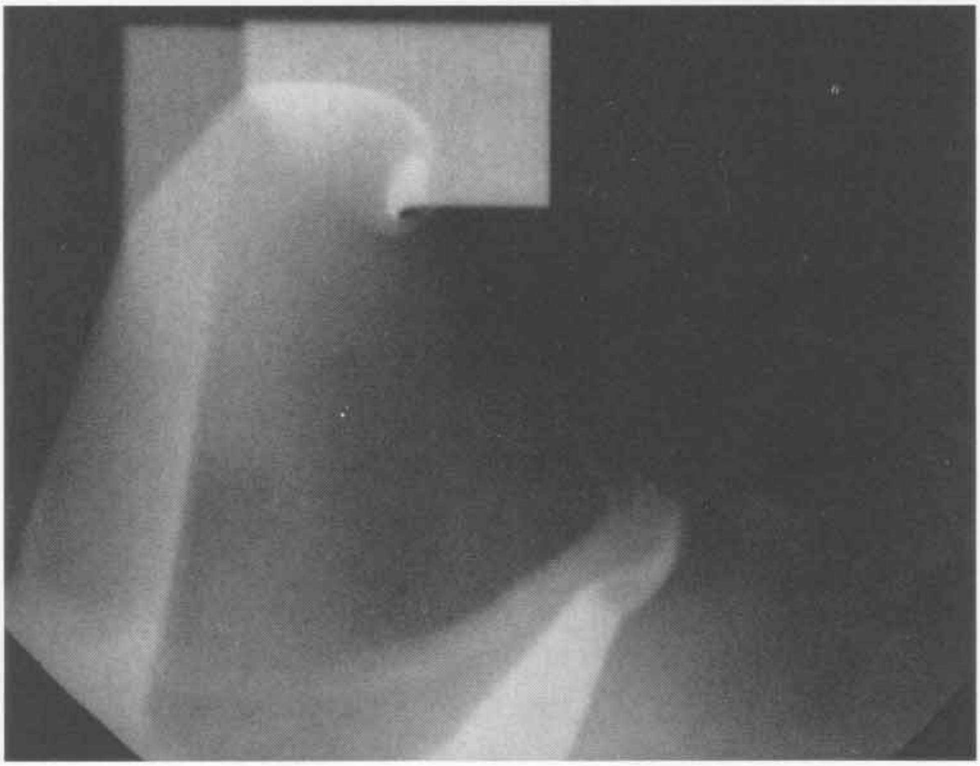


SHOT 1796: **TATB Turning a 90° Corner**
Date: May 26, 1977
Experimenter: Richard D. Dick
Radiographic Time: 42.90 μs

An X0291 (92.5/7.5 wt% TATB/Kel-F) detonation wave was initiated by 25.4 mm of PBX-9404 and a P-081 lens turning a 90° corner. See also Shots 1795 and 1797.







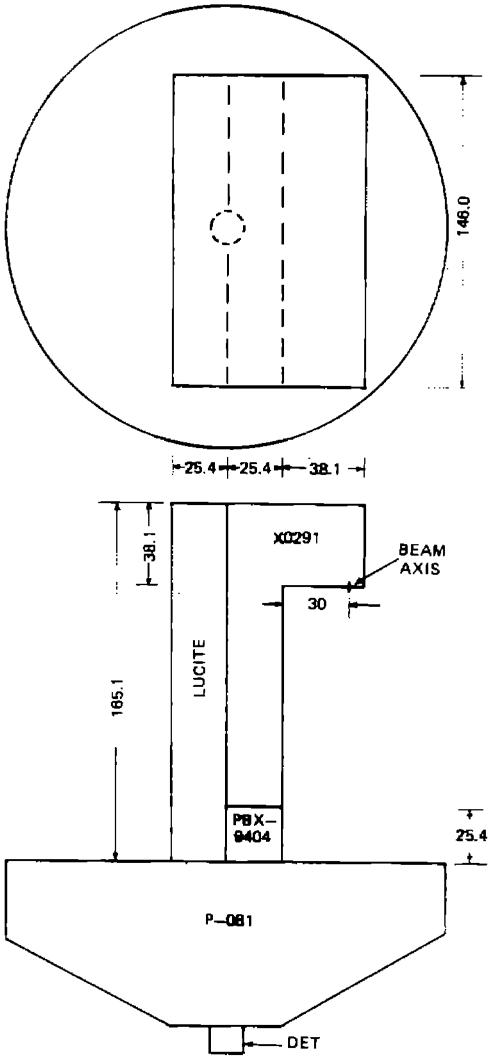
SHOT 1797: **TATB Turning a 90° Corner**

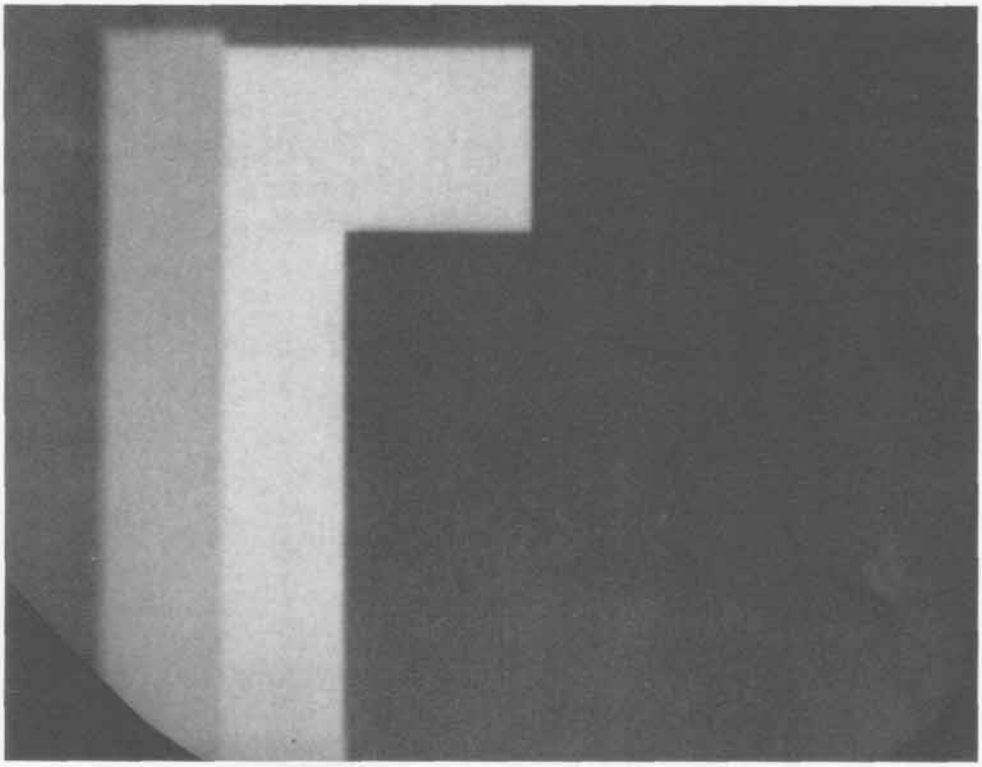
Date: August 3, 1977

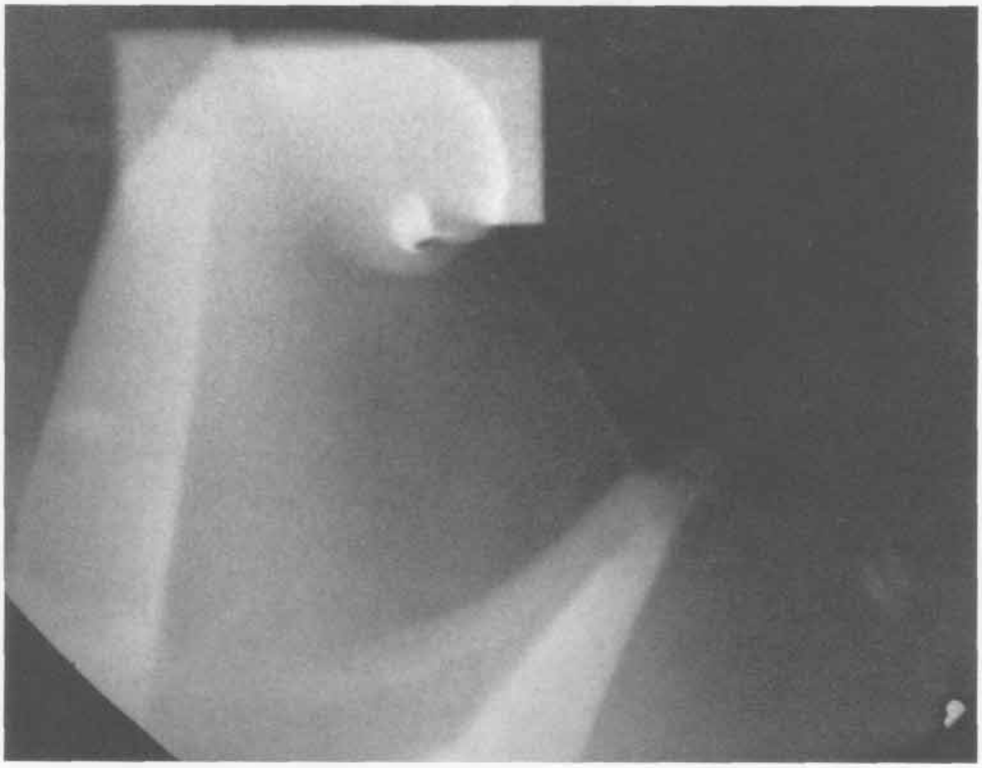
Experimenter: Richard D. Dick

Radiographic Time: 44.60 μs

An X0291 (92.5/7.5 wt% TATB/Kel-F) detonation wave was initiated by 25.4 mm of PBX-9404 and a P-081 lens turning a 90° corner. See also Shots 1795 and 1796.







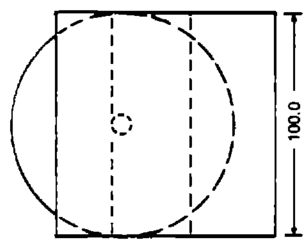
SHOT 1798: **Nitroguanidine Turning a 90° Corner**

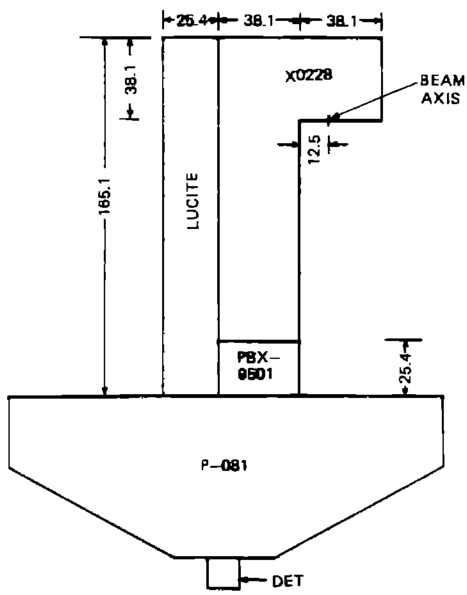
Date: May 24, 1977

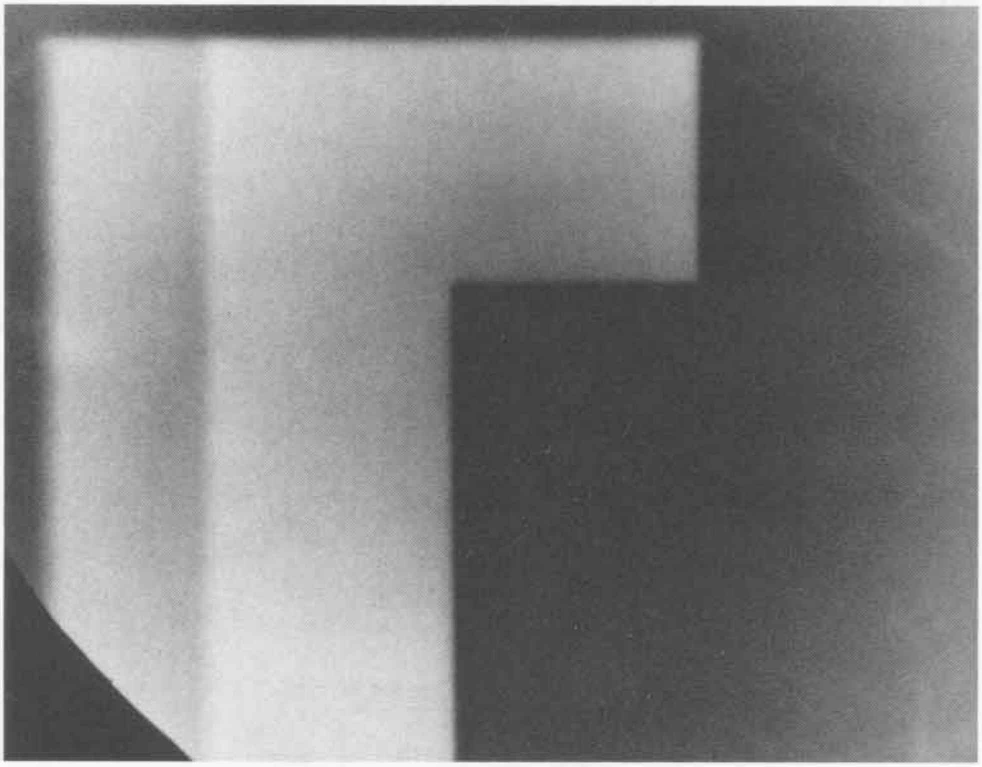
Experimenter: Richard D. Dick

Radiographic Time: 169.78 μs

An X0228 (95/5 wt% nitroguanidine/Estane at 1.70 g/cm³) detonation wave was initiated by 25.4 mm of PBX-9501 and a P-081 lens turning a 90° corner. See also Shot 1799.

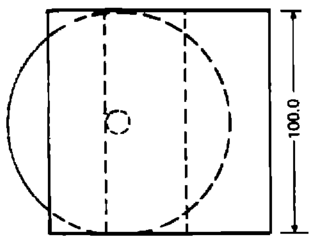


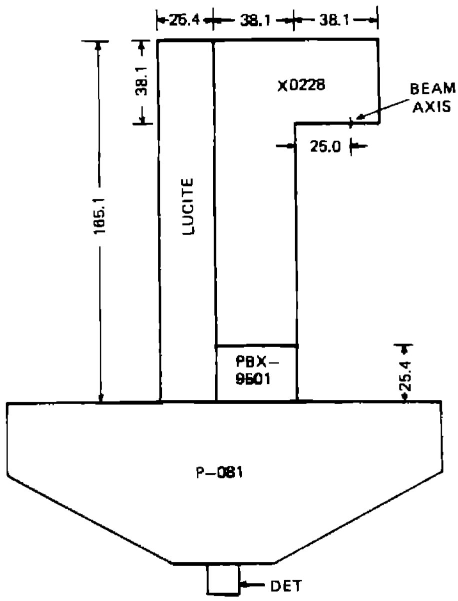


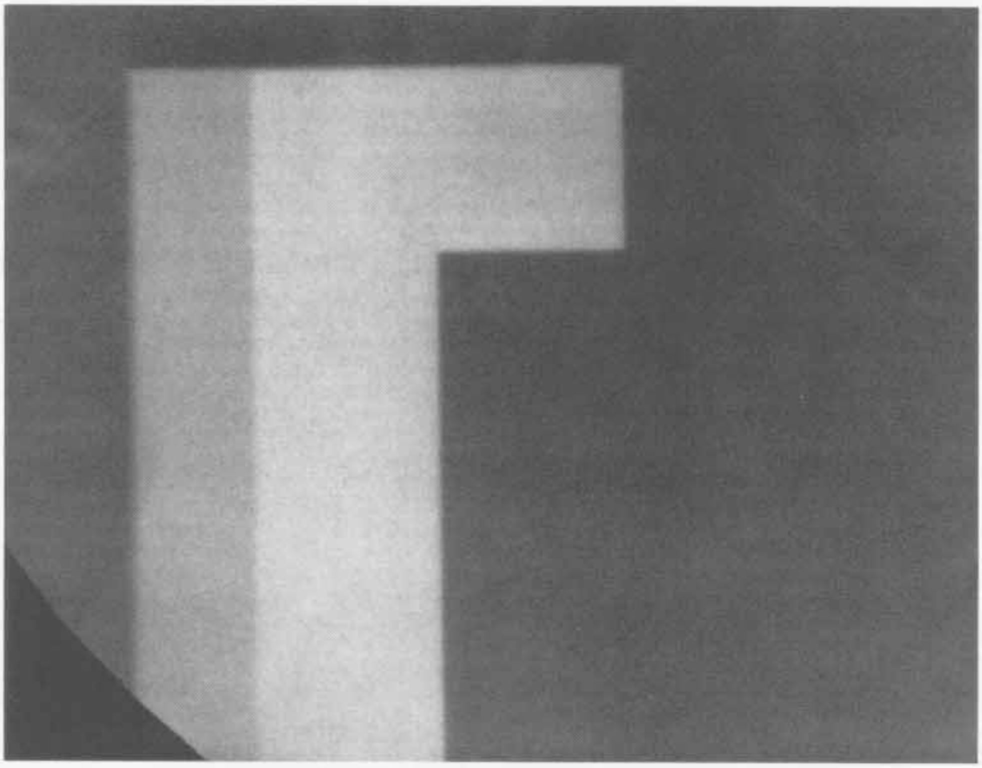


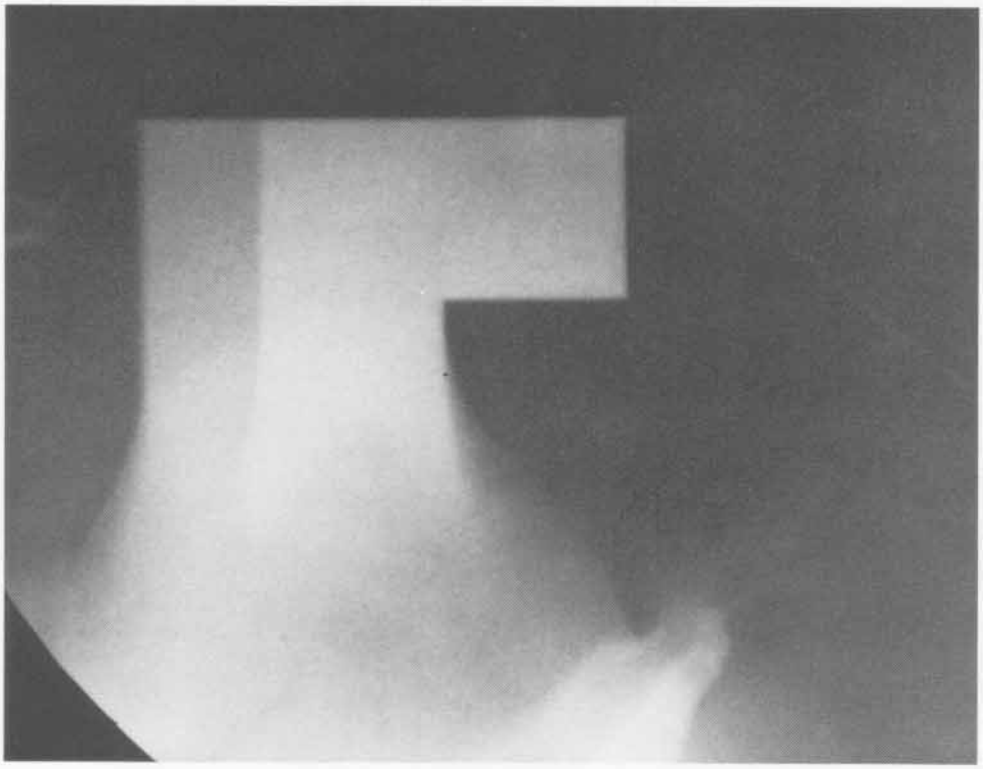
SHOT 1799: **Nitroguanidine Turning a 90° Corner**
Date: May 26, 1977
Experimenter: Richard D. Dick
Radiographic Time: 42.28 μs

An X0228 (95/5 wt% nitroguanidine/Estane at 1.70 g/cm³) detonation wave was initiated by 25.4 mm of PBX-9501 and a P-081 lens turning a 90° corner. See also Shot 1798.









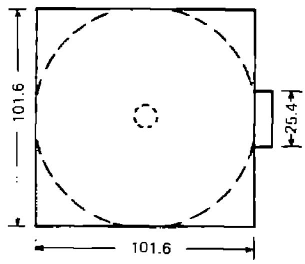
SHOT 1816: **Oblique Shock in Lead**

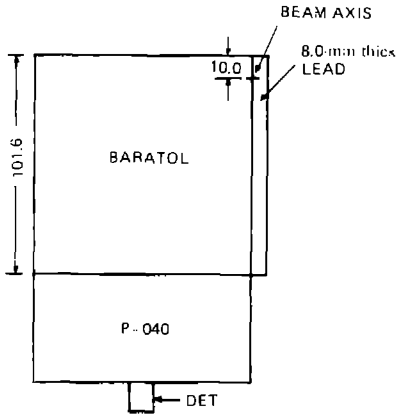
Date: September 14, 1977

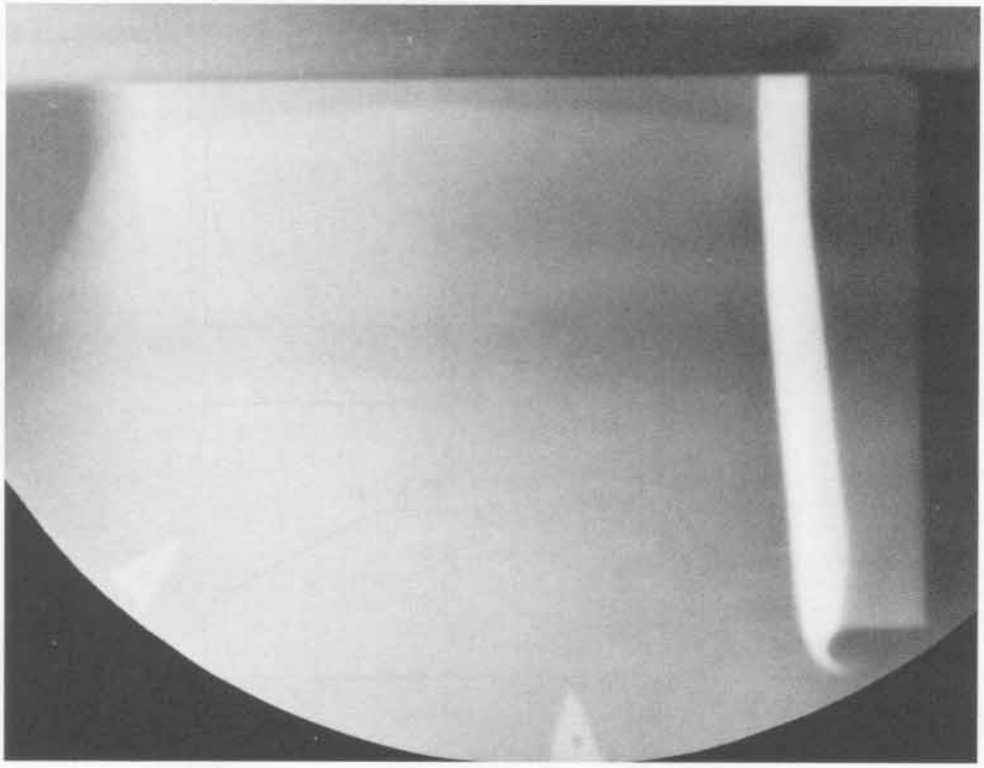
Experimenter: Timothy R. Neal

Radiographic Time: 33.74 μs

An oblique shock in lead was driven by 101.6 mm of Baratol initiated by a P-040 lens. An alignment mirror is shown in the background.

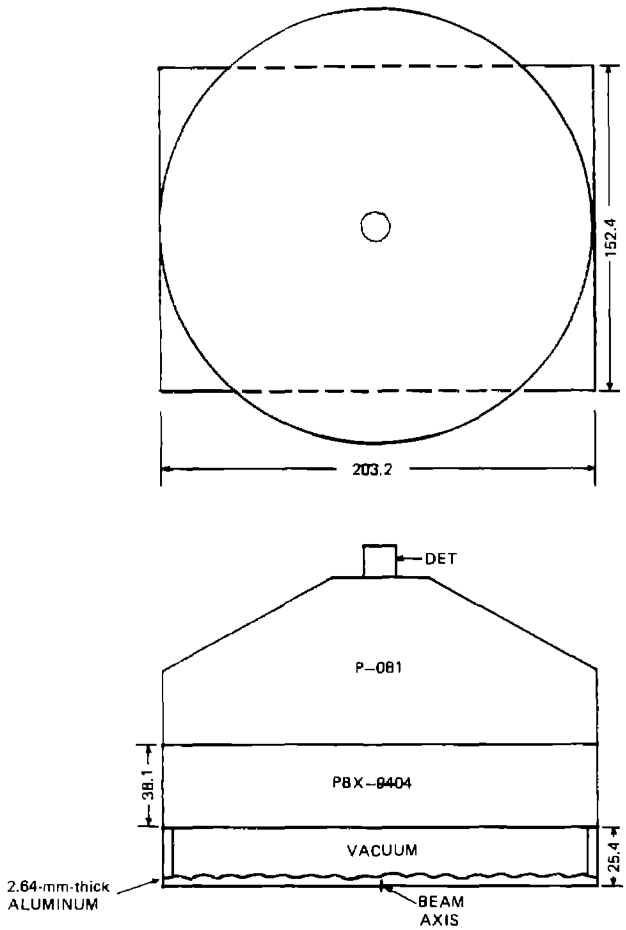


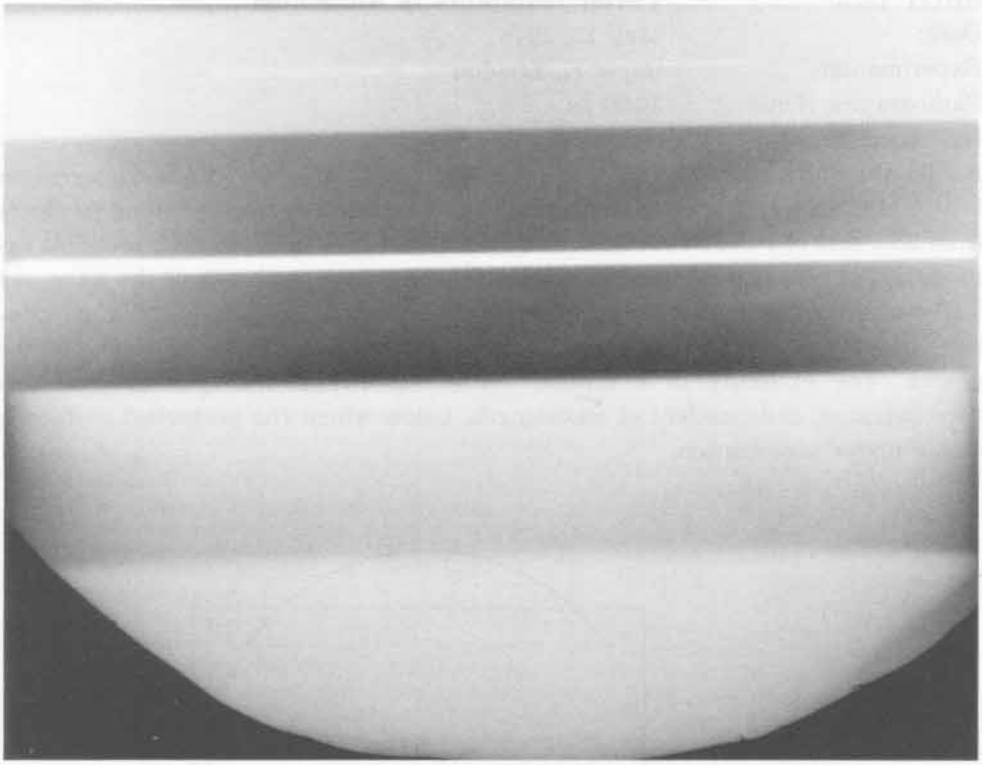


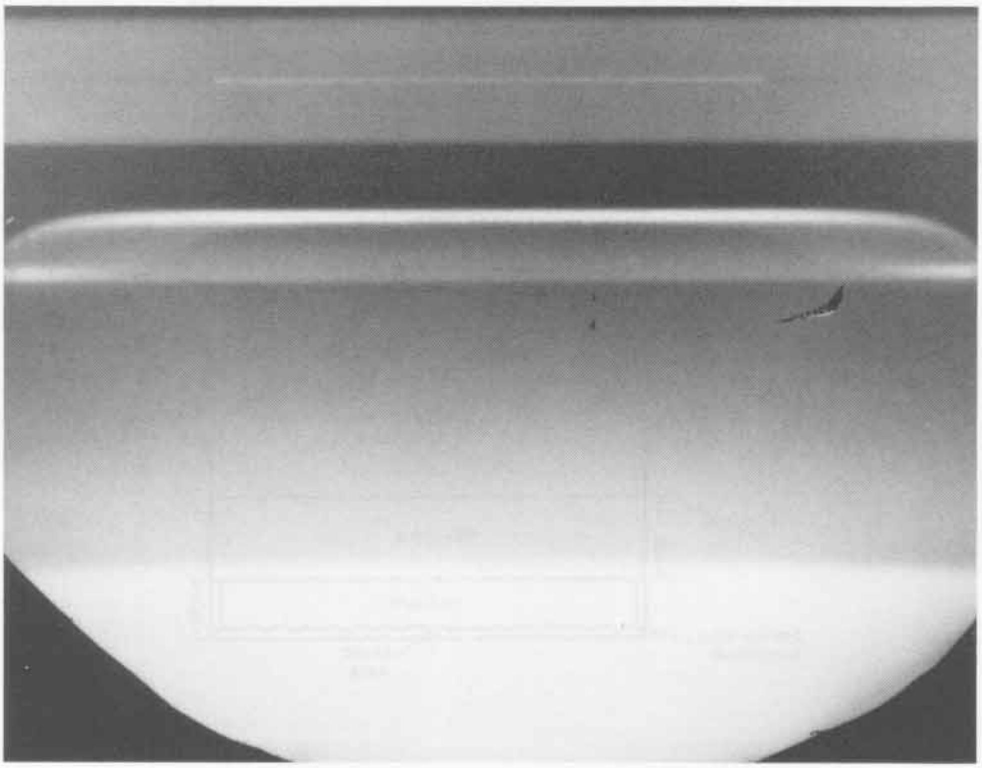


SHOT 1824: **Taylor Instability in Aluminum**
Date: May 4, 1978
Experimenter: Roger K. London
Radiographic Time: 34.90 μs
Reference: Barnes et al., 1974

A 2.64-mm-thick plate of 1100 aluminum with uniform sinusoidal surface grooves 0.1016 mm deep and a wavelength of 2.54 mm was driven by detonation products from 38.1 mm of PBX-9404 initiated by a P-081 lens. The detonation products expanded 25.4 mm in a vacuum for 7.9 μs. The observed amplitude of the wave was 0.21 mm. See also Shot 1353.

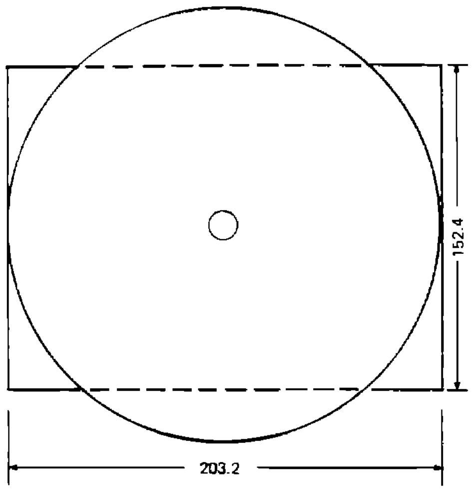


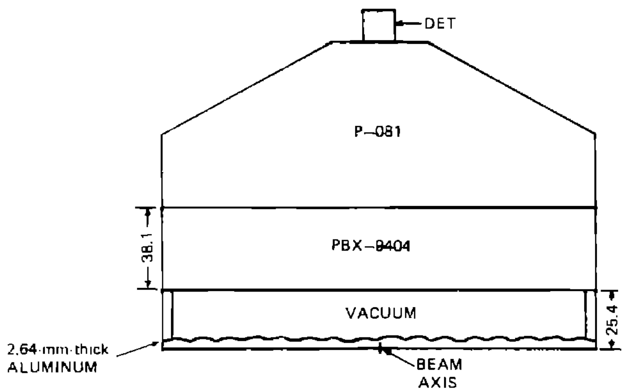


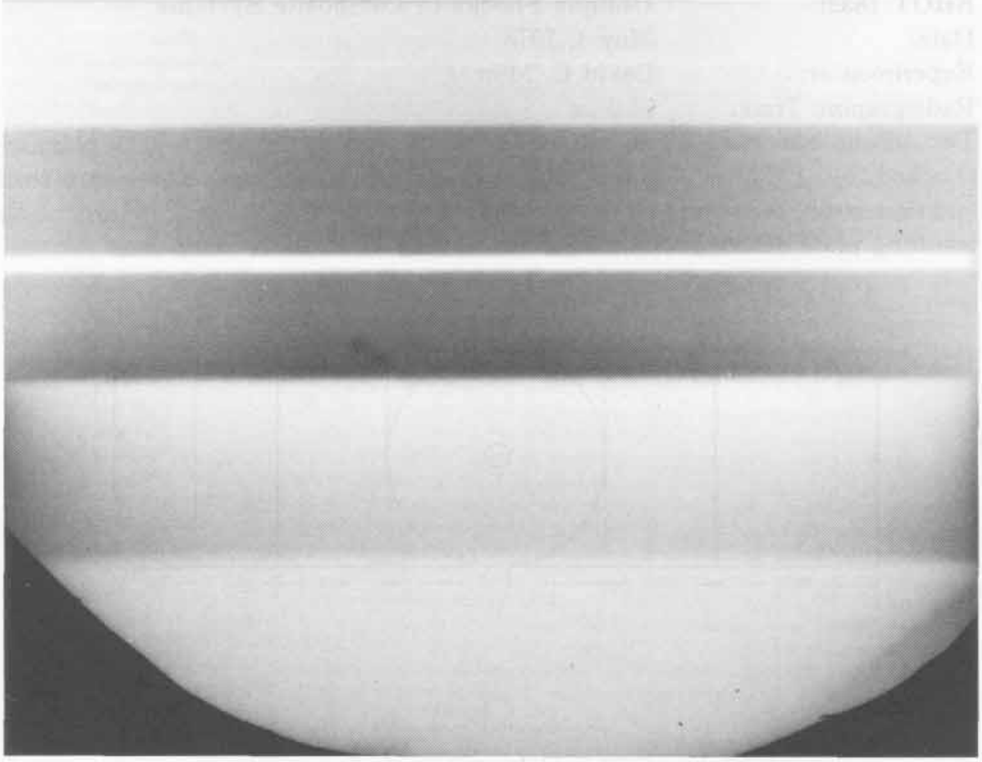


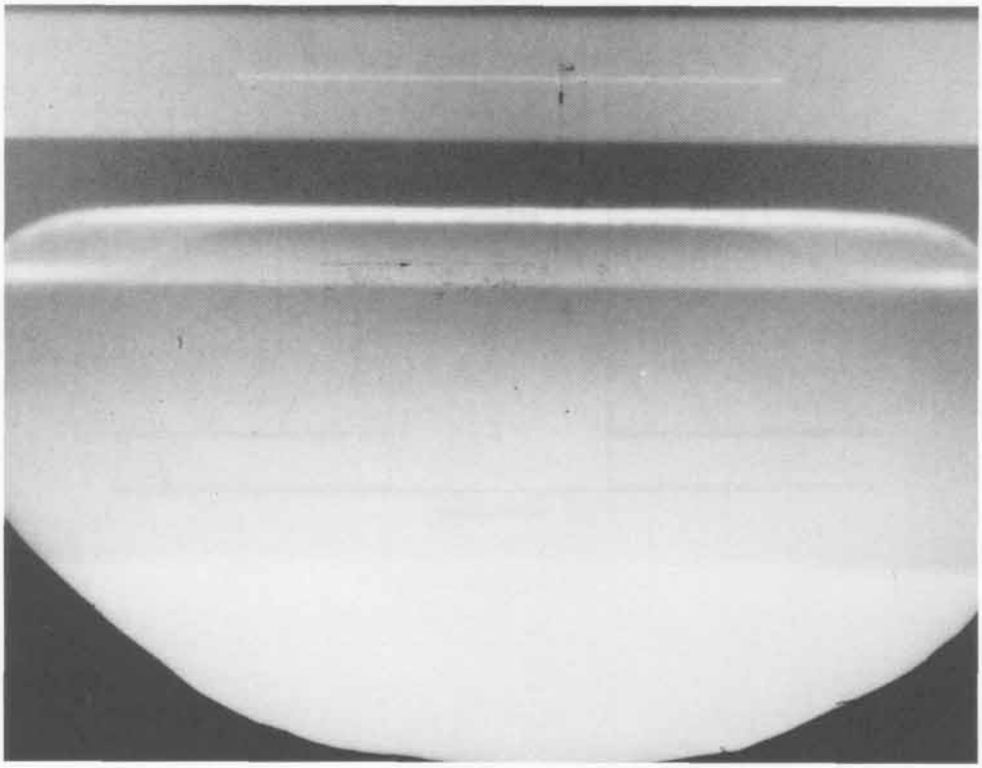
SHOT 1825:	**Taylor Instability in Aluminum**
Date:	May 10, 1978
Experimenter:	Roger K. London
Radiographic Time:	34.90 μs
Reference:	Barnes et al., 1974

A 2.64-mm-thick plate of 1100 aluminum with uniform sinusoidal surface grooves 0.1016 mm deep and a wavelength of 5.08 mm was driven by detonation products from 38.1 mm of PBX-9404 initiated by a P-081 lens. The detonation products expanded 25.4 mm in a vacuum for 6.9 μs. The observed amplitude of the wave was 0.19 mm. Shots 1824 and 1825 show that the growth of the instability is independent of wavelength and dependent upon the initial amplitude or depth of the groove. The existence of a critical initial amplitude or depth of groove is demonstrated, independent of wavelength, below which the perturbed surface is stable under acceleration.



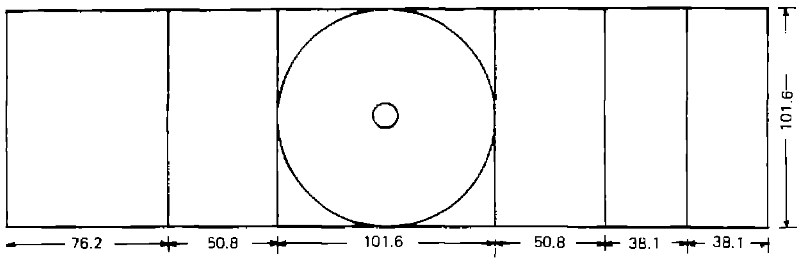


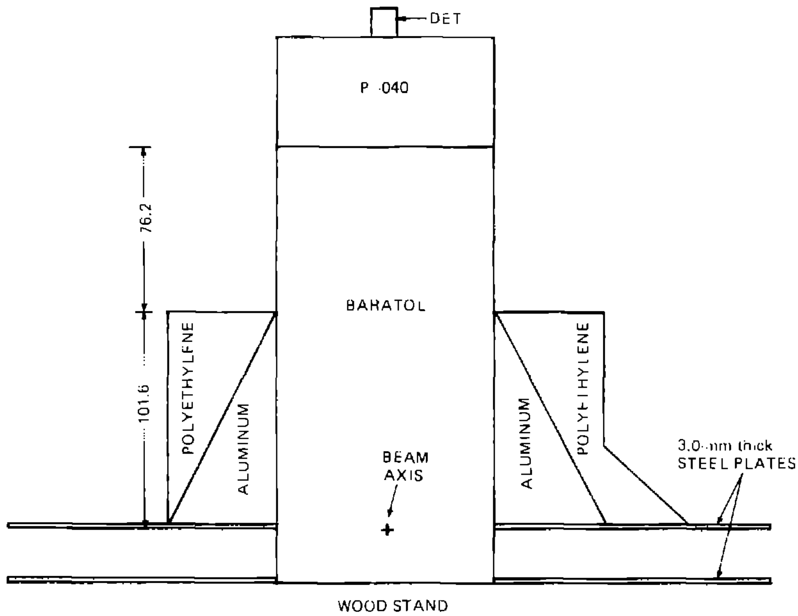


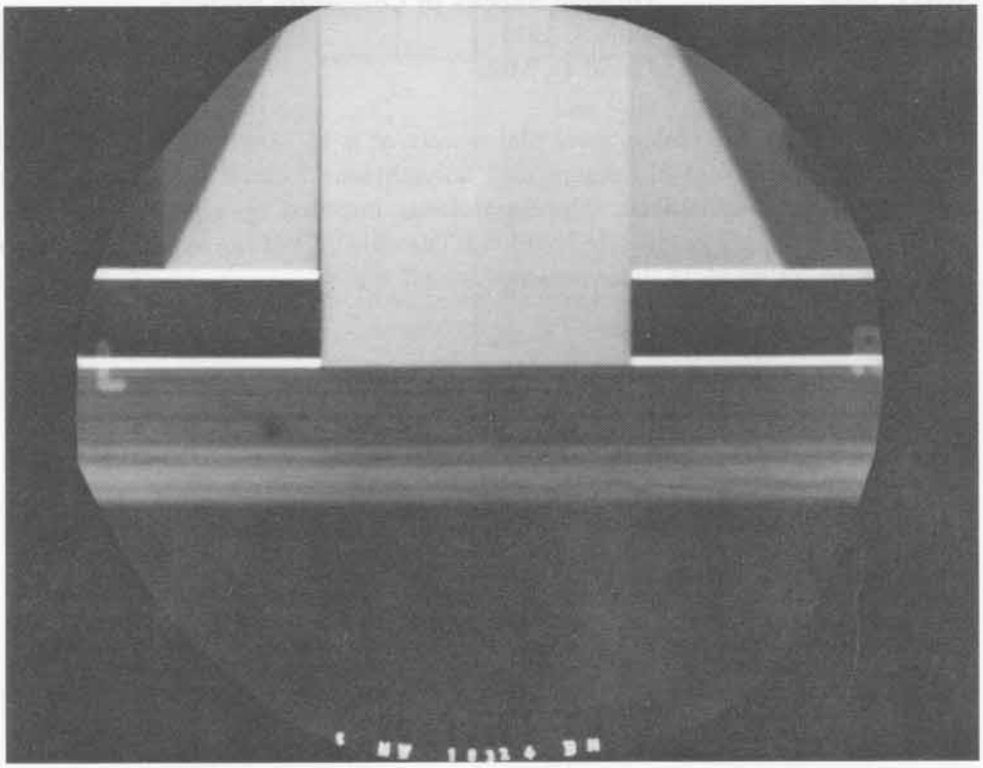


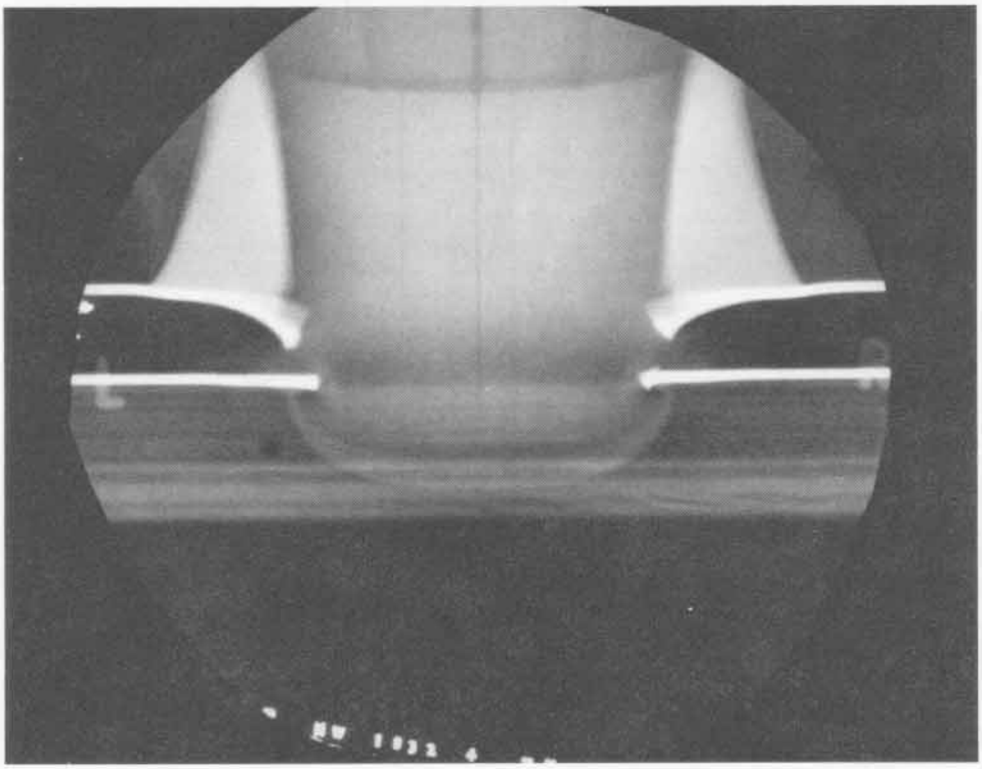
SHOT 1832: **Oblique Shocks in Composite Systems**
Date: May 4, 1978
Experimenter: David C. Moir
Radiographic Time: 75.2 μs

Two blocks consisting of an aluminum and polyethylene wedge were obliquely shocked by 177.8 of Baratol initiated by a P-040 lens. Three-mm-thick stainless steel plates were on the bottom of the composite blocks to determine the resulting plate deformation.



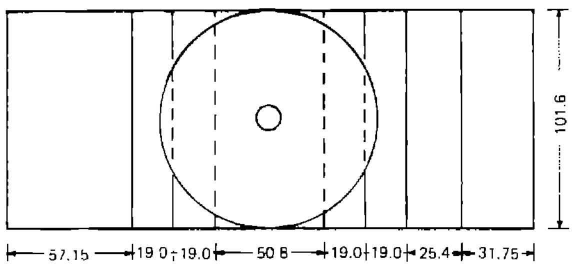


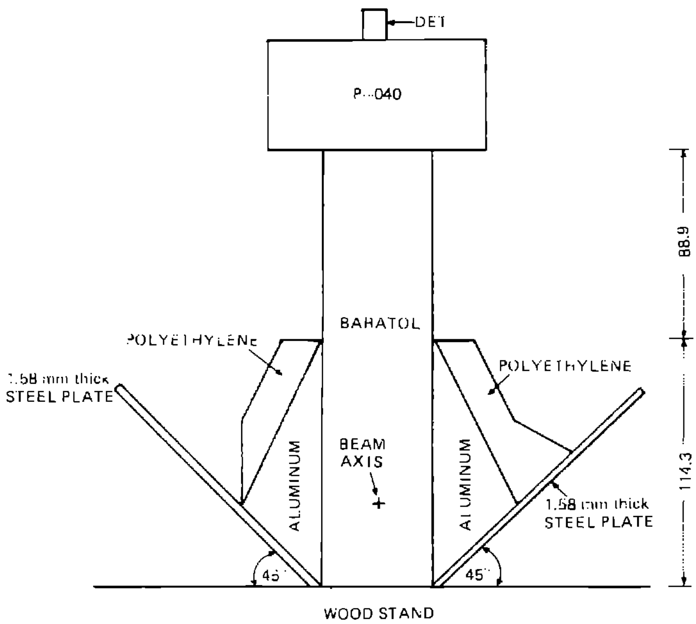


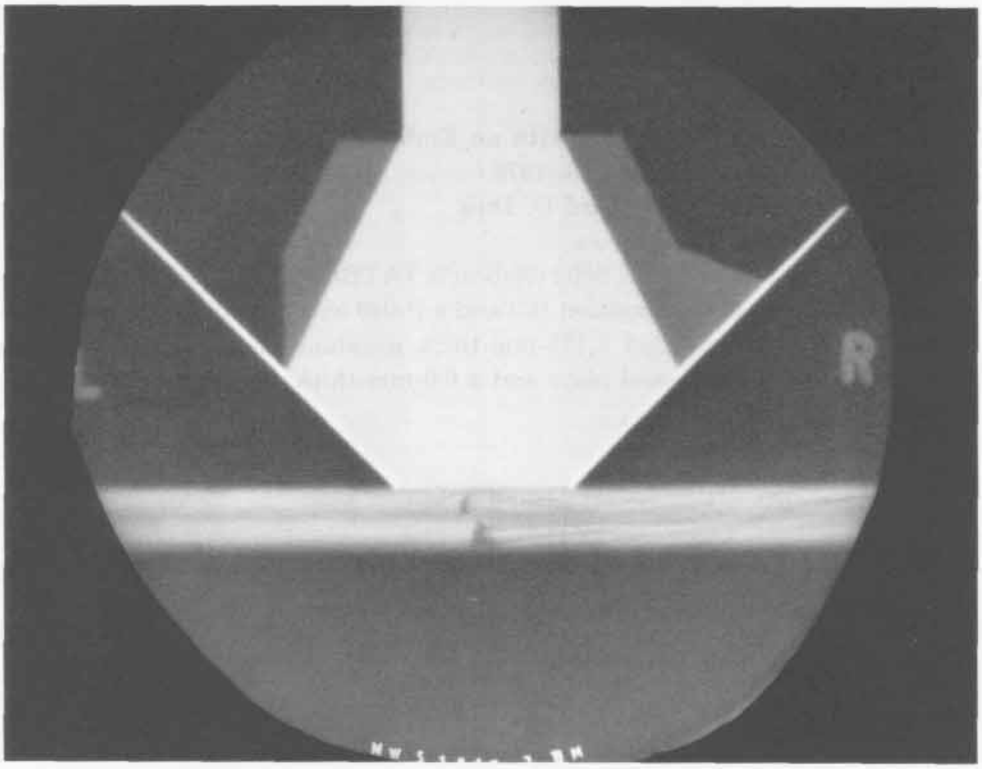


SHOT 1845: **Oblique Shocks in Composite Systems**
Date: June 8, 1978
Experimenter: David C. Moir
Radiographic Time: 83.9 μs

Two 1.58-mm-thick stainless steel plates were at a 45° angle from 203.2 mm of Baratol with wedges of aluminum and polyethylene located between the steel plates and the Baratol block. The Baratol was initiated by a P-040 lens, and it obliquely shocked the composite system. The objective of the experiment was to study the resulting plate deformation.



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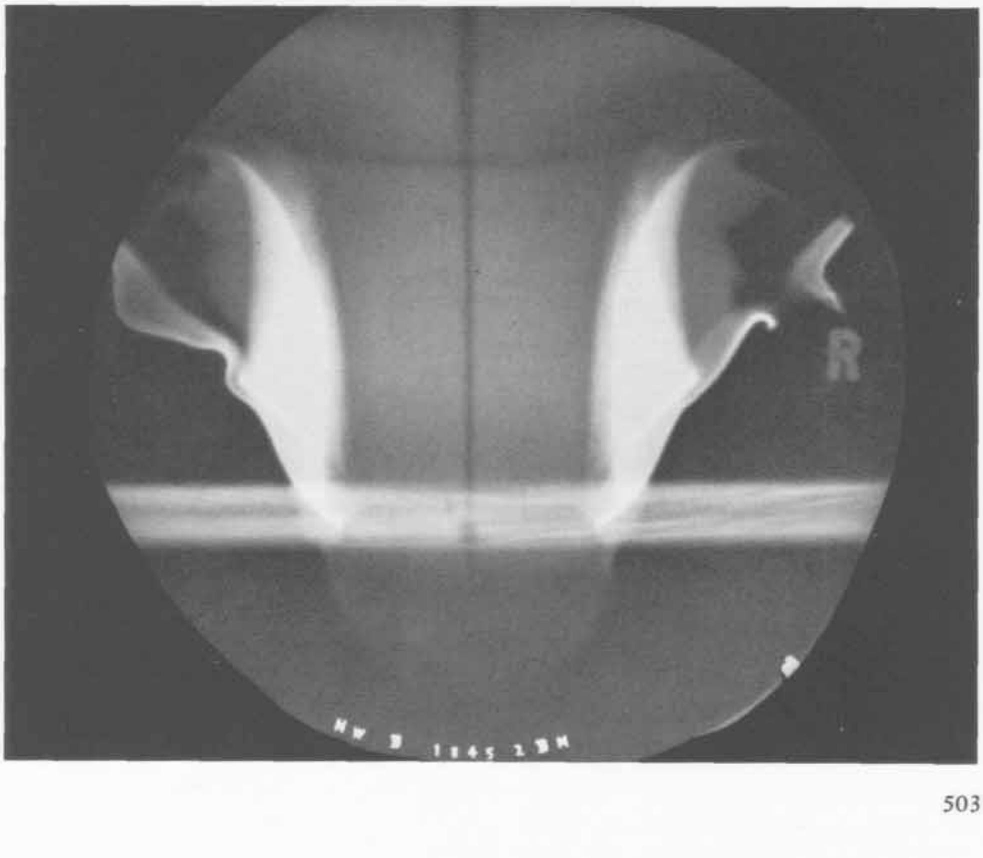
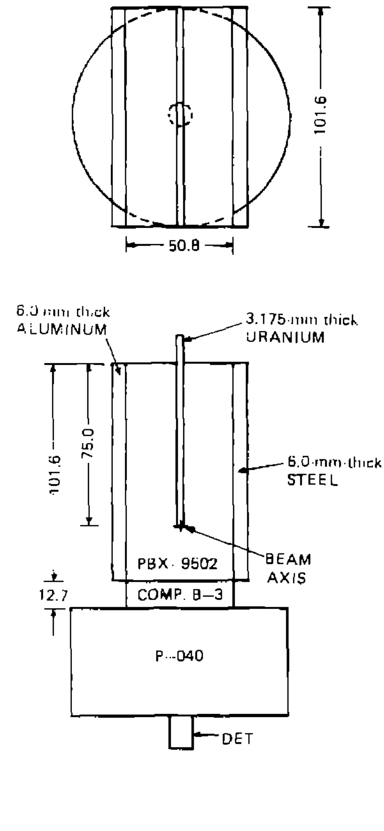
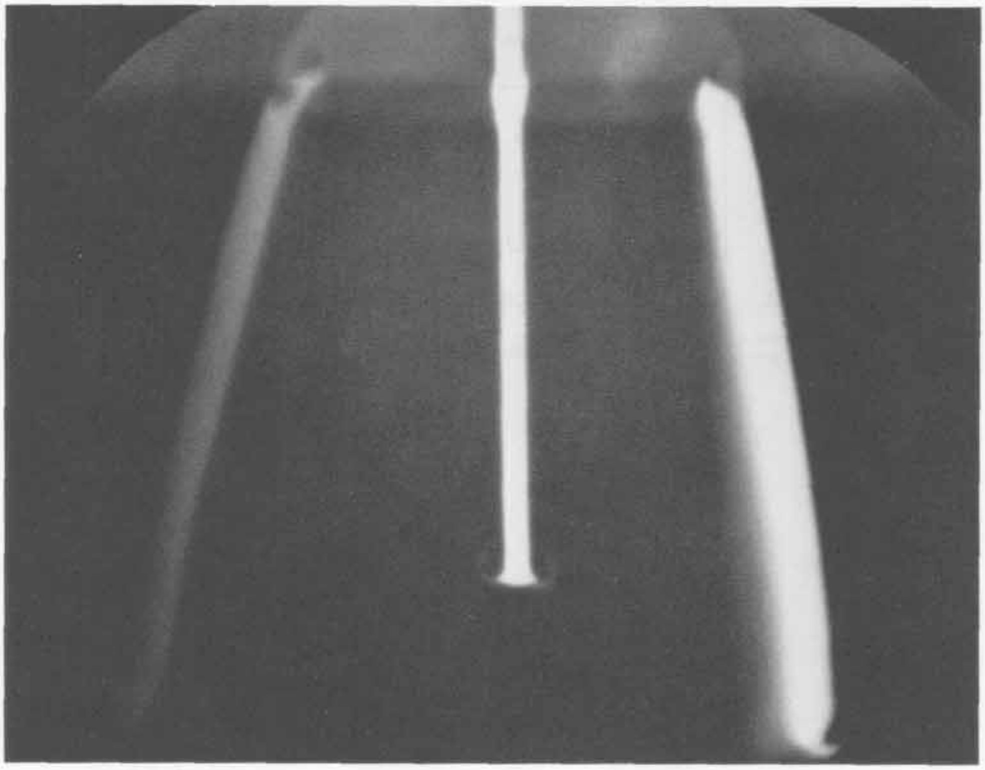

R

SHOT 1855: **TATB with an Embedded Uranium Plate**
Date: June 13, 1978
Experimenter: Richard D. Dick
Radiographic Time: 33.0 μs

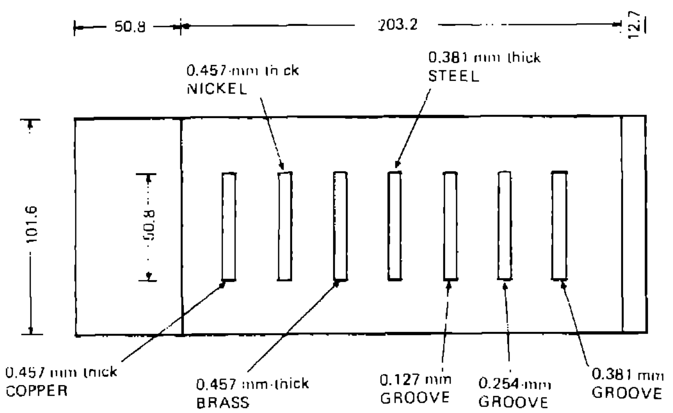
A 50.8-mm-wide block of PBX-9502 (95/5 wt% TATB/Kel-F at 1.894 g/cm^3) was initiated by 12.7 mm of Composition B-3 and a P-040 lens. The detonation wave interacted with an embedded 3.175-mm-thick uranium plate, and it obliquely shocked a 6.0-mm-thick steel plate and a 6.0-mm-thick aluminum plate.

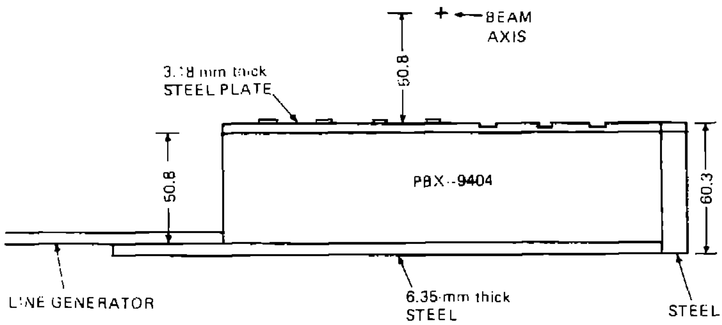


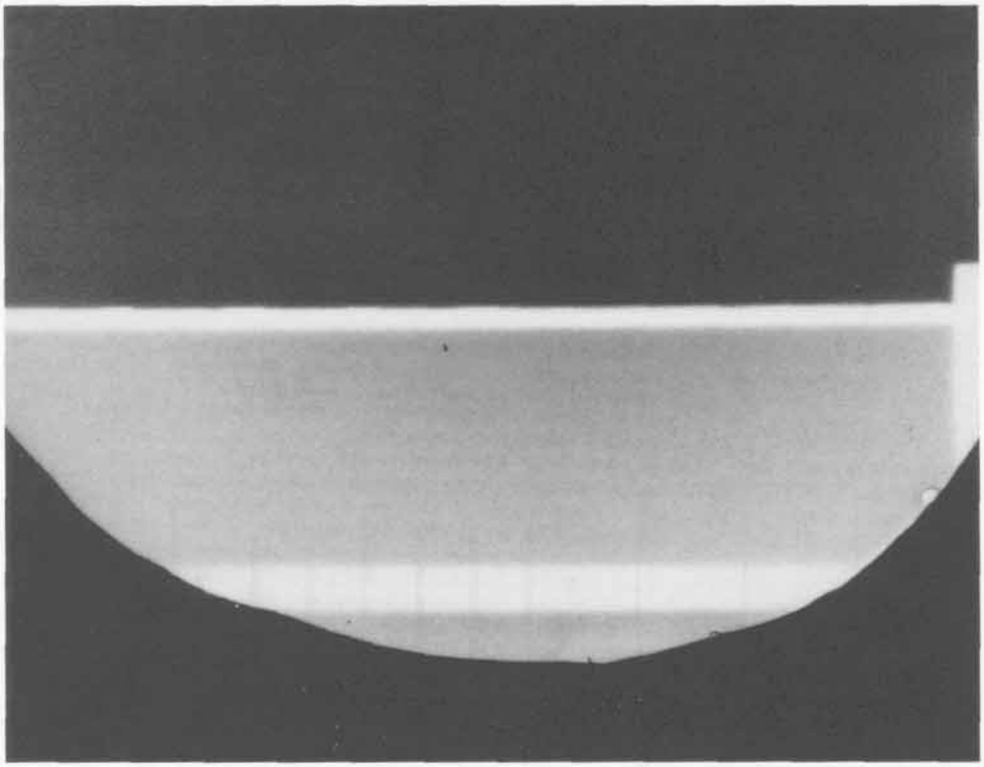


SHOT 1891: **Surface Perturbations on a Shocked Steel Plate**
Date: October 11, 1978
Experimenter: David C. Moir
Radiographic Time: 53.0 μs

A 3.18-mm-thick stainless steel plate was obliquely driven by a PBX-9404 detonation. On top of the plate were metal strips of various shock impedance and rectangular grooves of various depths. The effect of the surface perturbations showed that the grooves resulted in increased plate velocity, and the metal strips decreased the plate velocity and resulted in plate fracture. The end of the plate with the 0.381-mm-deep groove traveled 125 mm, and the end with the nickel foil traveled 152 mm.

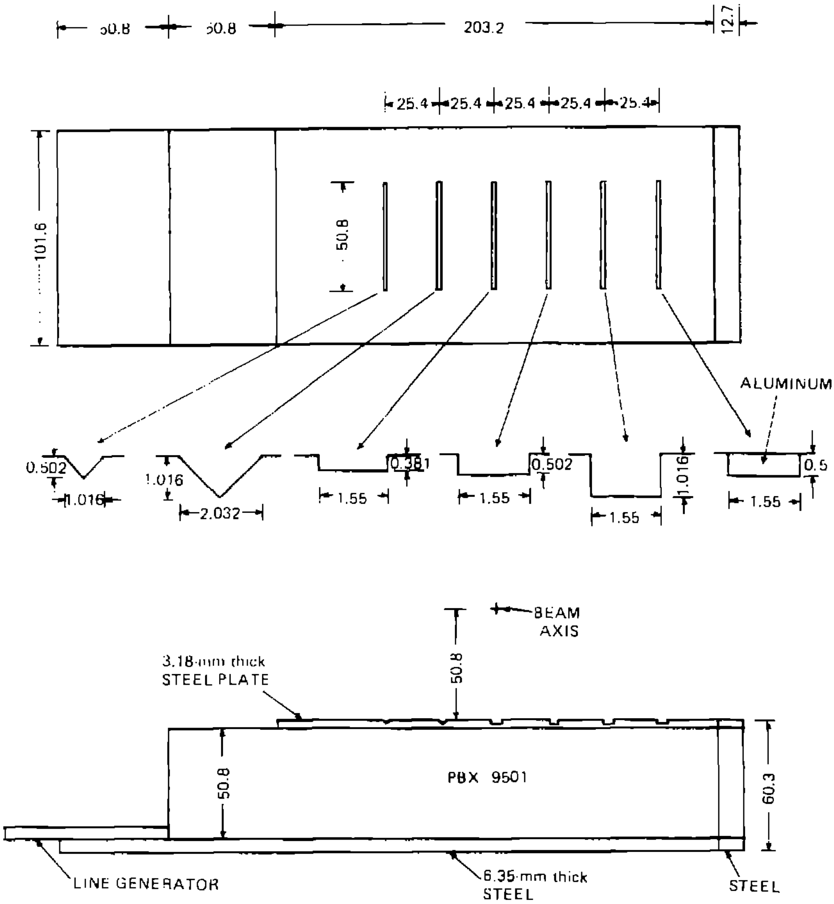


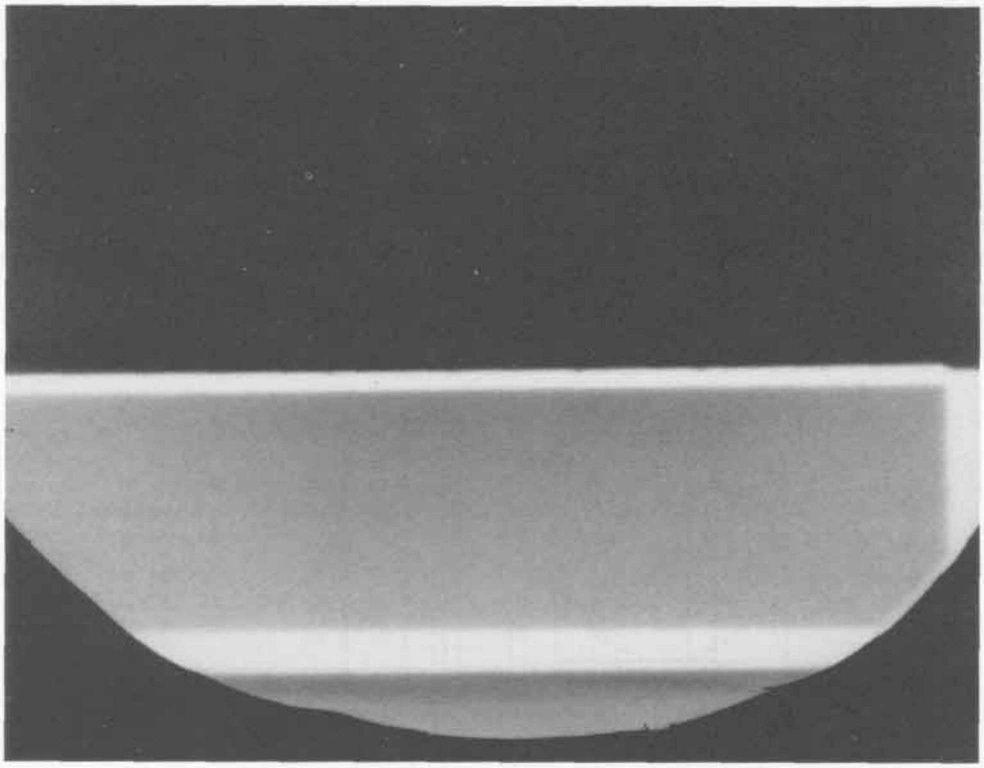


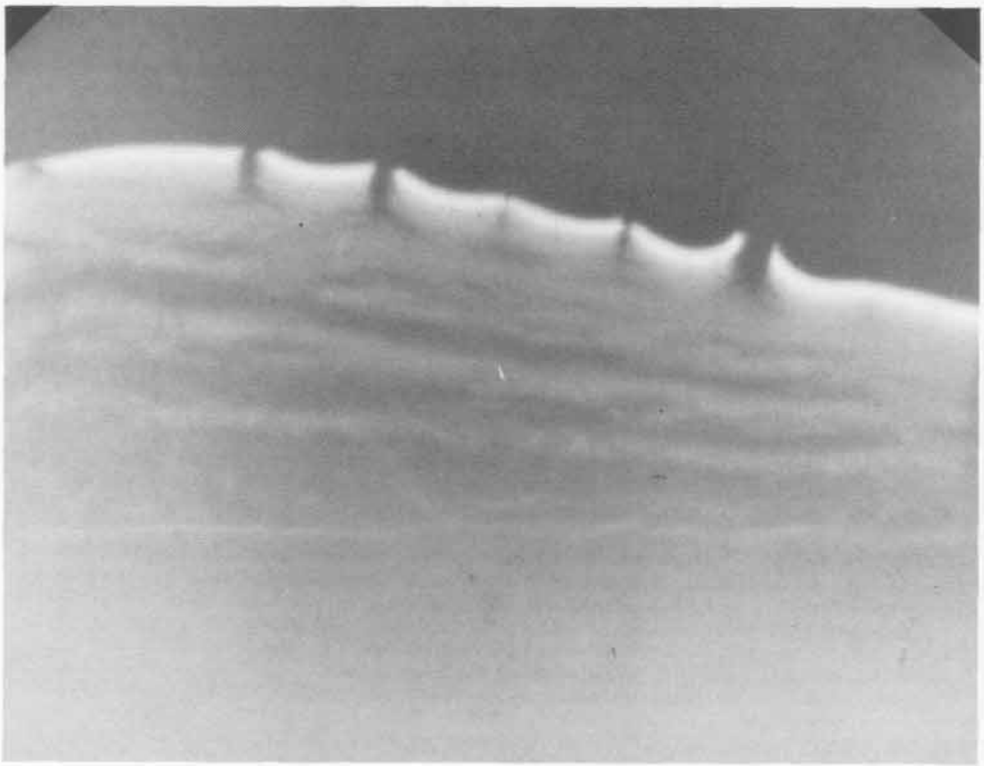


SHOT 1892: **Surface Perturbations on a Shocked Steel Plate**
Date: February 27, 1979
Experimenter: David C. Moir
Radiographic Time: 74.2 μs

A 3.18-mm-thick stainless steel plate was obliquely driven by a PBX-9501 detonation. The plate surface had triangular and rectangular grooves of various sizes. One rectangular groove was filled with aluminum. All of the grooves resulted in fracture of the plate except the aluminum-filled groove.







SHOT 1914: **Desensitization of TATB by Preshocking**

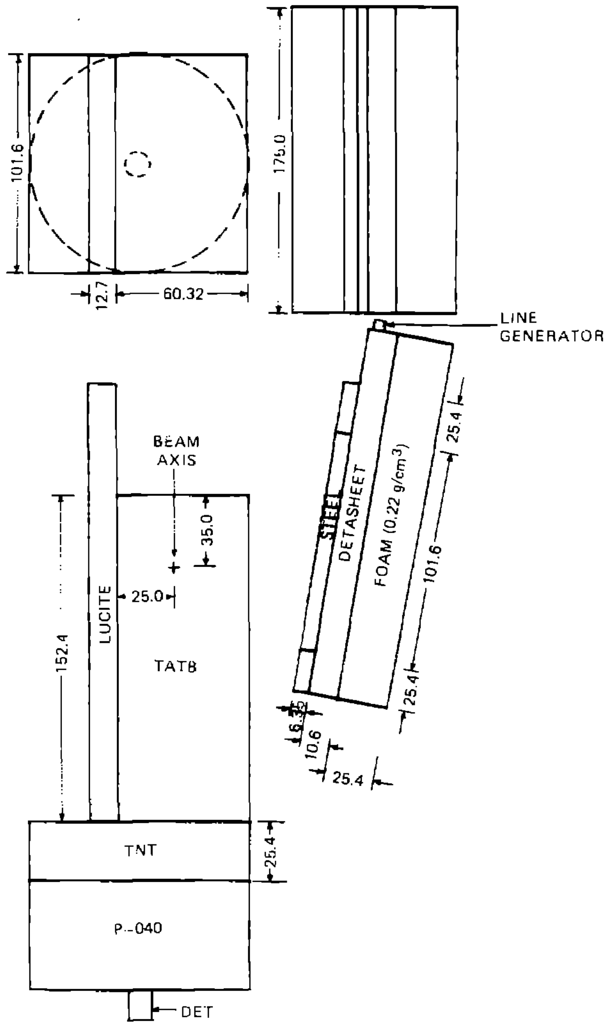
Date: April 4, 1979

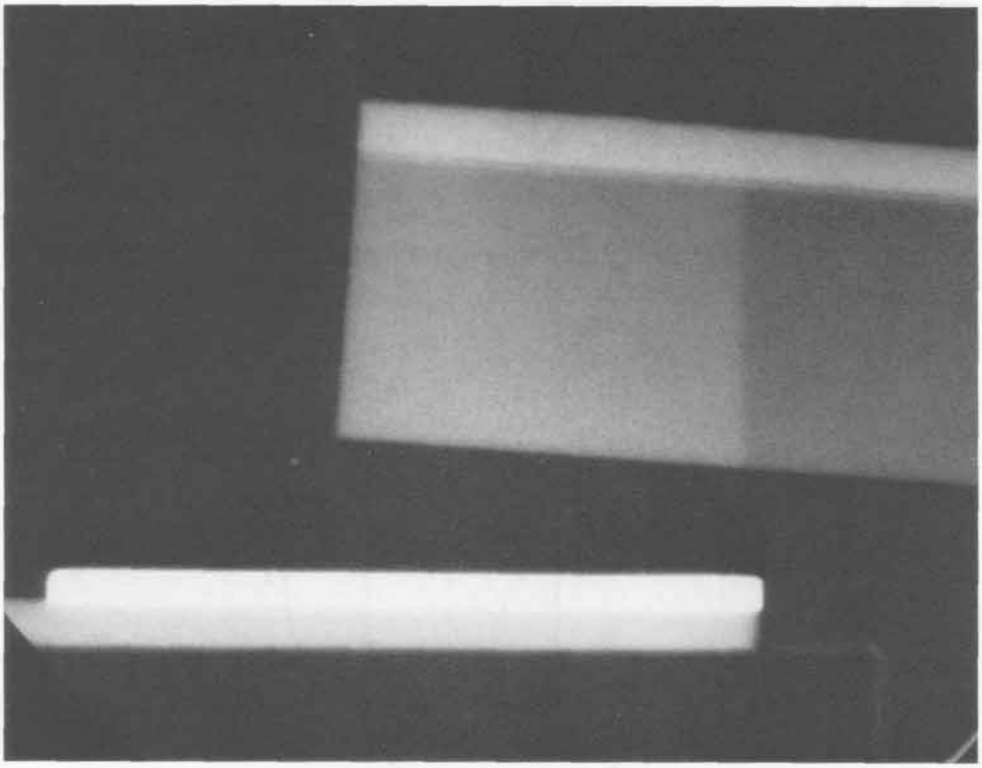
Experimenter: Richard D. Dick

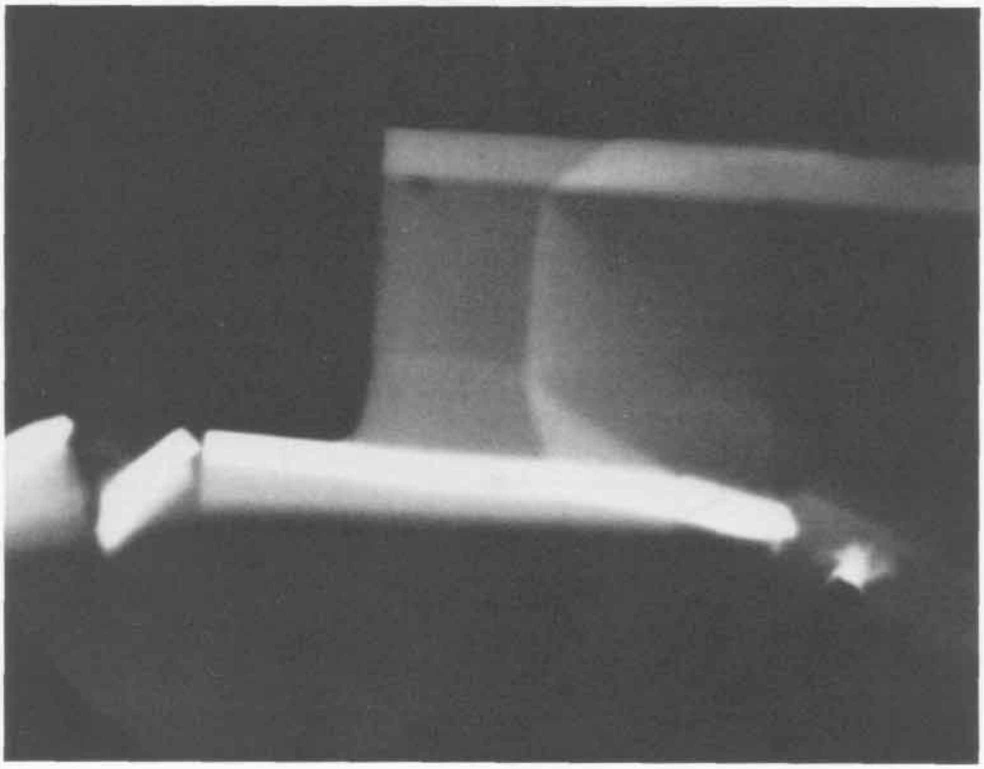
Radiographic Time: 89.0 μs

Reference: Mader and Dick, 1979

PBX-9502 (95/5 wt% TATB/Kel-F at 1.894 g/cm^3) was shocked by a 6.35-mm-thick steel plate going 0.46 mm/μs and was initiated by 25.4 mm of TNT and a P-040 lens after a delay of 68.2 μs. The resulting detonation failed to propagate in the preshocked explosive. See also Shot 1698.

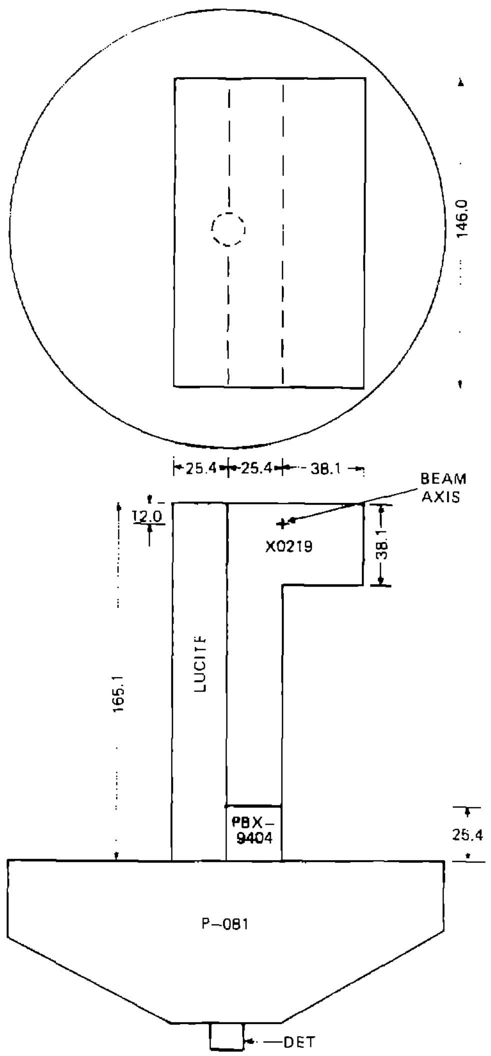


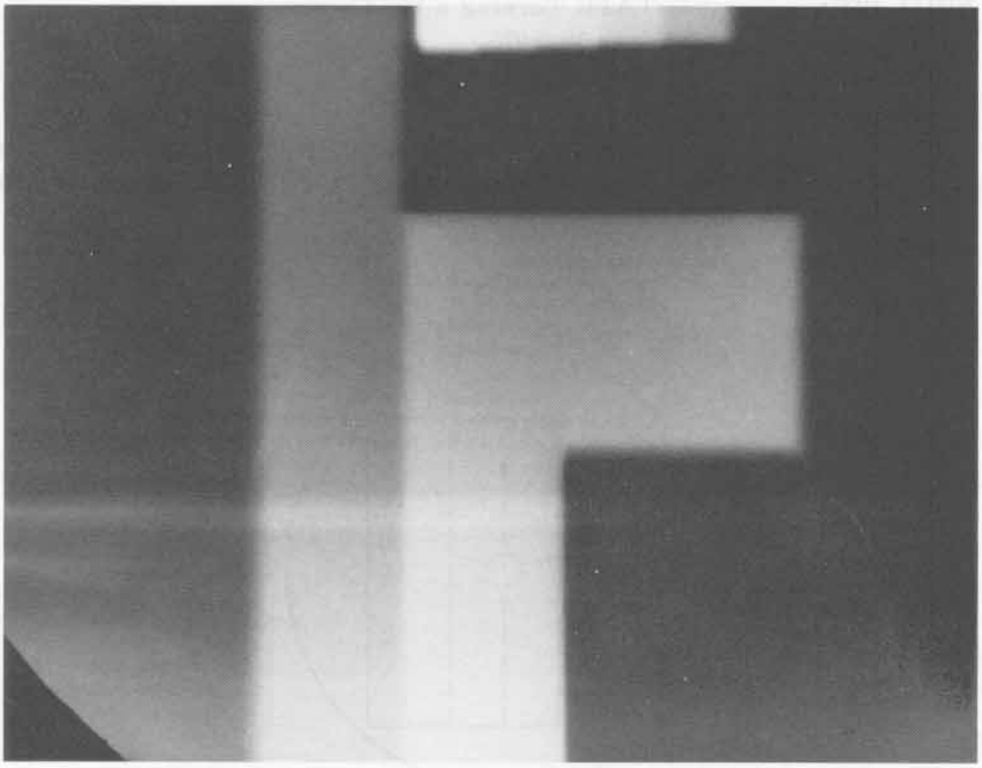


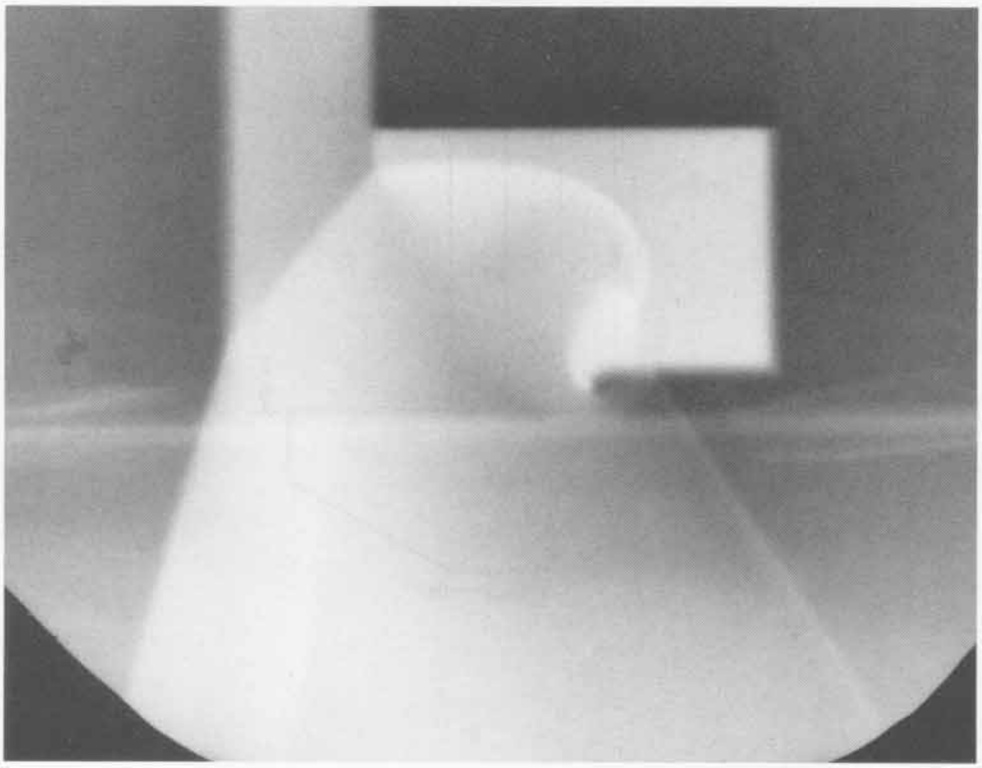


SHOT 1936: **TATB Turning a 90° Corner**
Date: June 18, 1975
Experimenter: Richard D. Dick
Radiographic Time: 44.06 μs
Reference: Mader, 1979

An X0219 (90/10 wt% TATB/Kel-F at 1.914 g/cm[3]) detonation wave was initiated by 25.4 mm of PBX-9404 and a P-081 lens turning a 90° corner. See also Shots 1940 and 1942. A step wedge used for density calibration is shown on top of the shot.

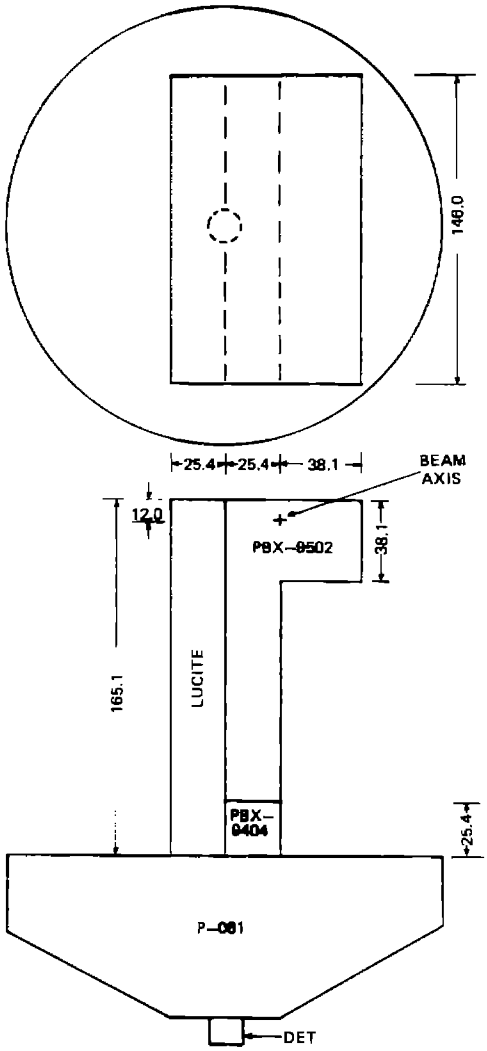


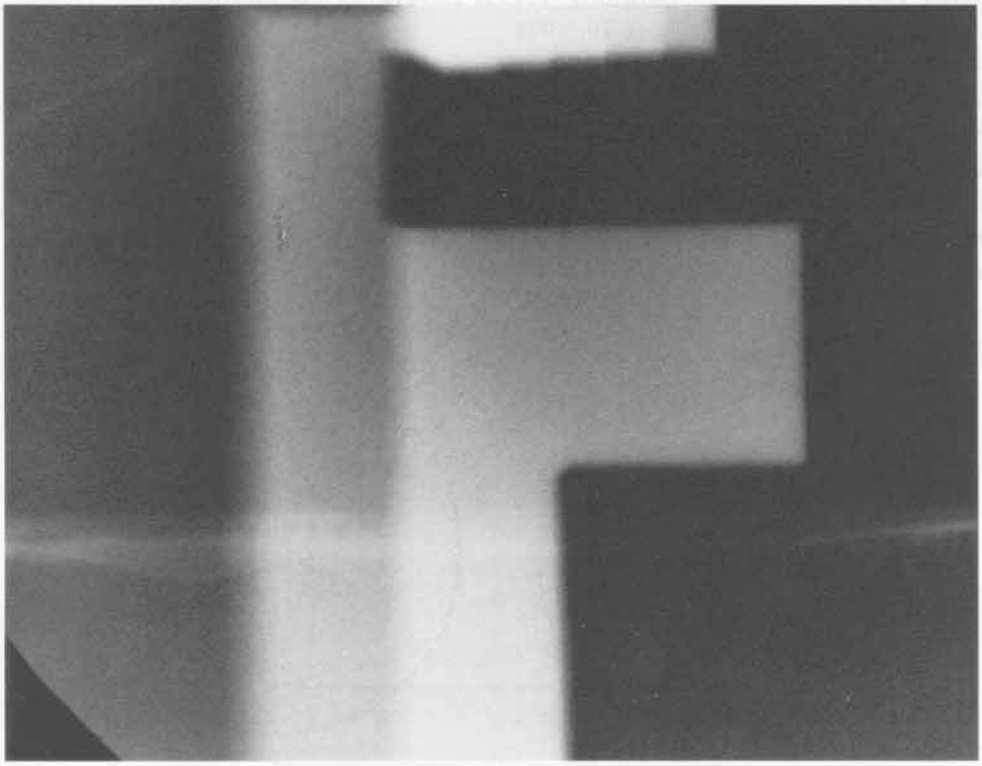


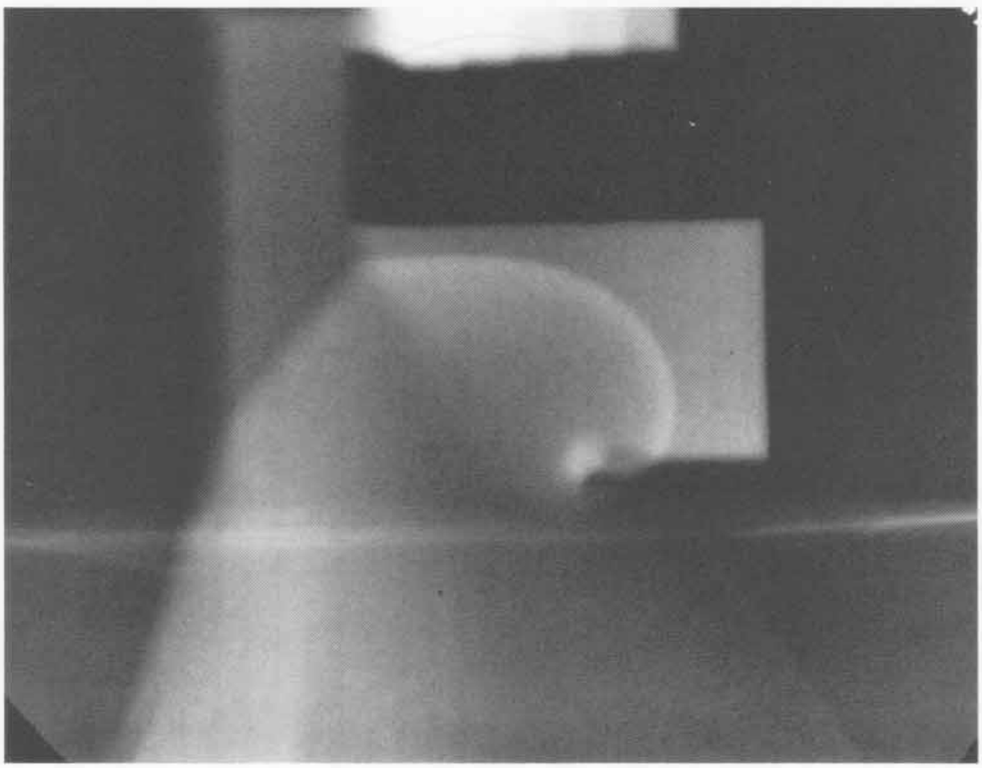


SHOT 1937: **TATB Turning a 90° Corner**
Date: June 18, 1975
Experimenter: Richard D. Dick
Radiographic Time: 43.80 μs

A PBX-9502 (95/5 wt% TATB/Kel-F at 1.895 g/cm³) detonation wave was initiated by 25.4 mm of PBX-9404 and a P-081 lens turning a 90° corner. See also Shots 1705, 1941, and 1943. A step wedge used for density calibration is shown on top of the shot.

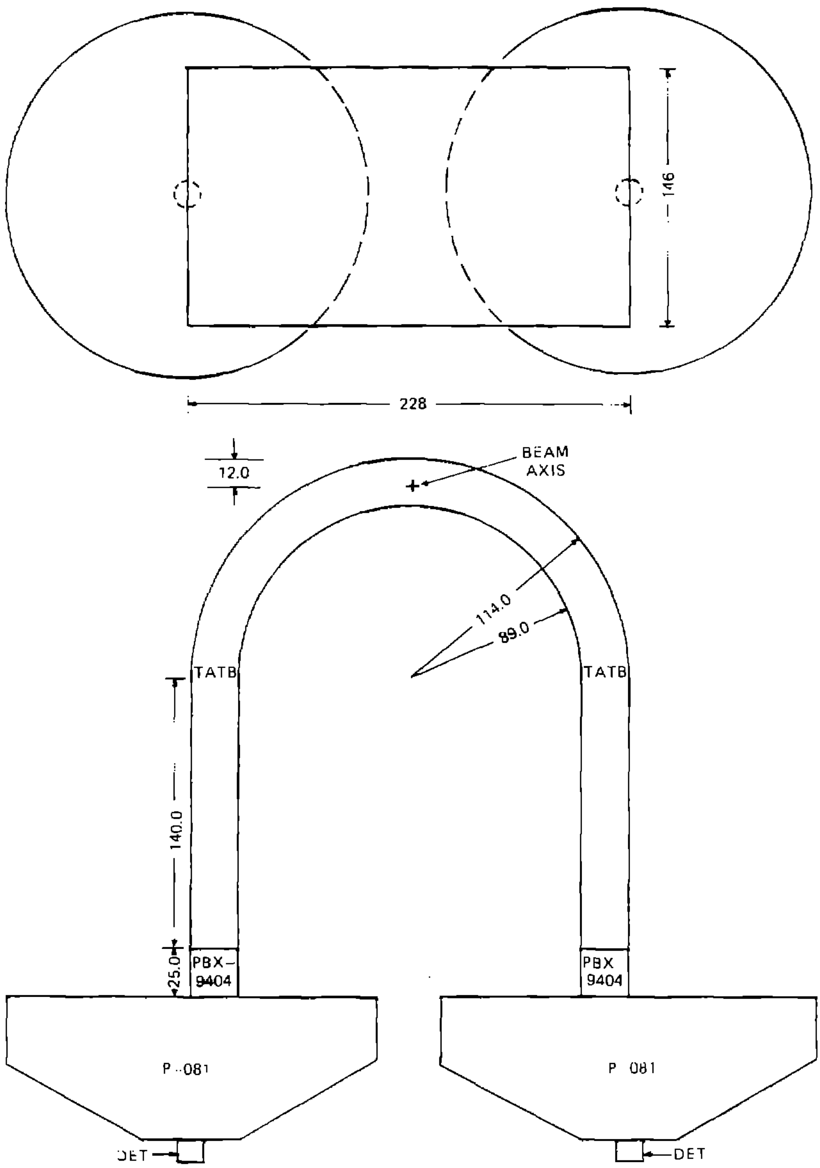


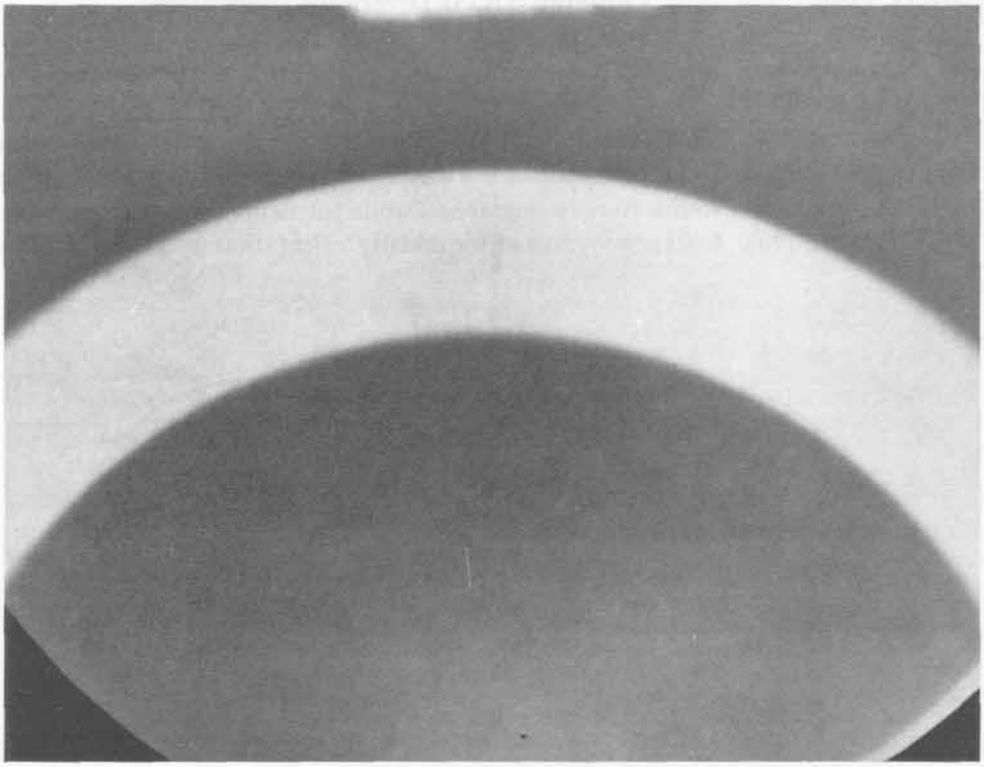


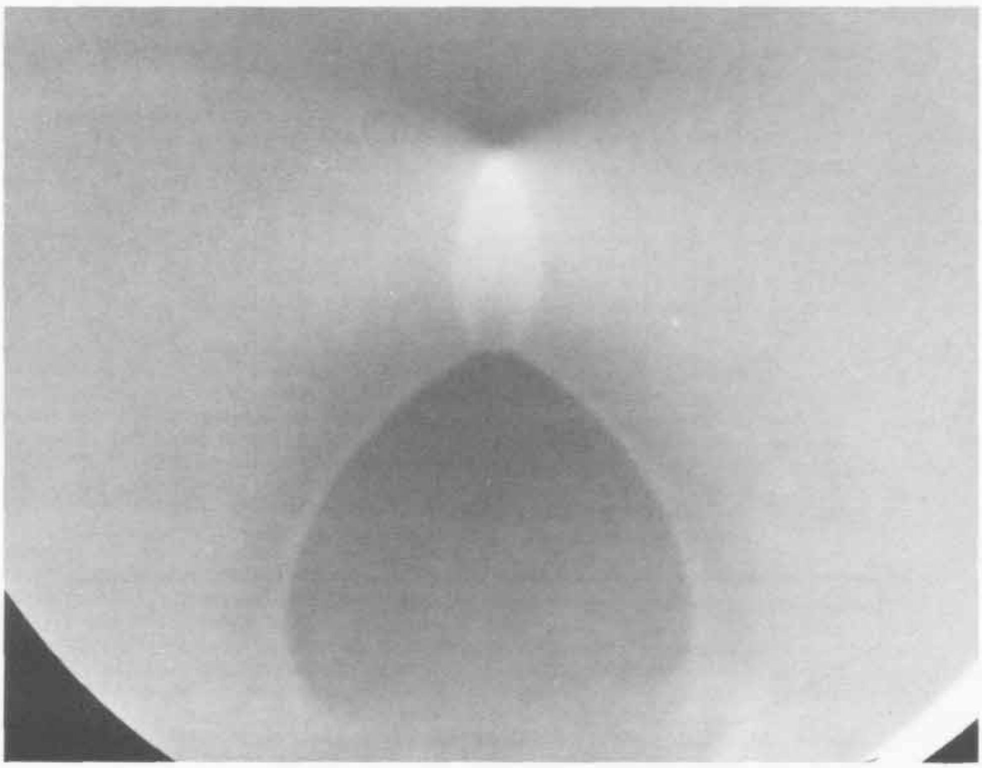


SHOT 1938: **Colliding TATB Diverging Detonations**
Date: June 19, 1975
Experimenter: Richard D. Dick
Radiographic Time: 65.50 μs

Two diverging X0219 (90/10 wt% TATB/Kel-F at 1.914 g/cm^3) detonations formed by simultaneously initiating the two ends of an X0219 arc of 89.0-mm inner radius and 114.0-mm outer radius were radiographed while the detonations were colliding. See also Shot 1703. A step wedge used for density calibration is shown on top of the shot.







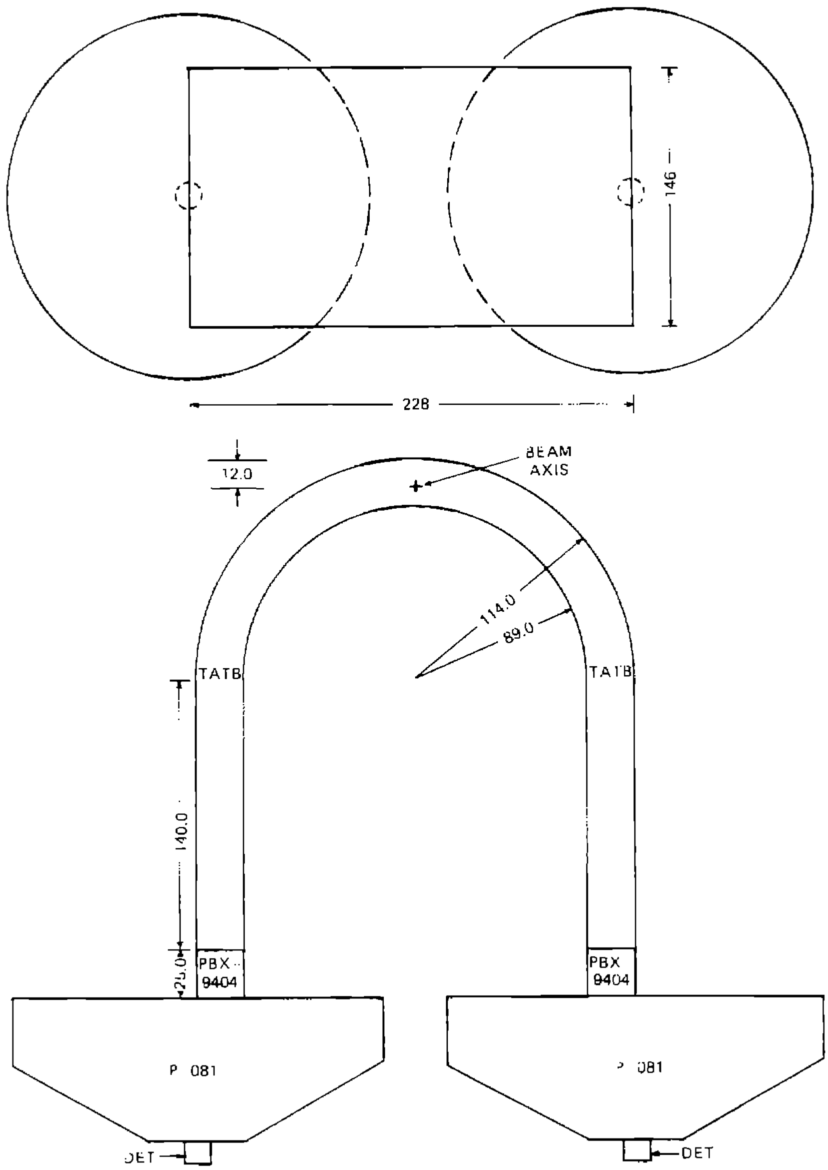
SHOT 1939: **Colliding TATB Diverging Detonations**

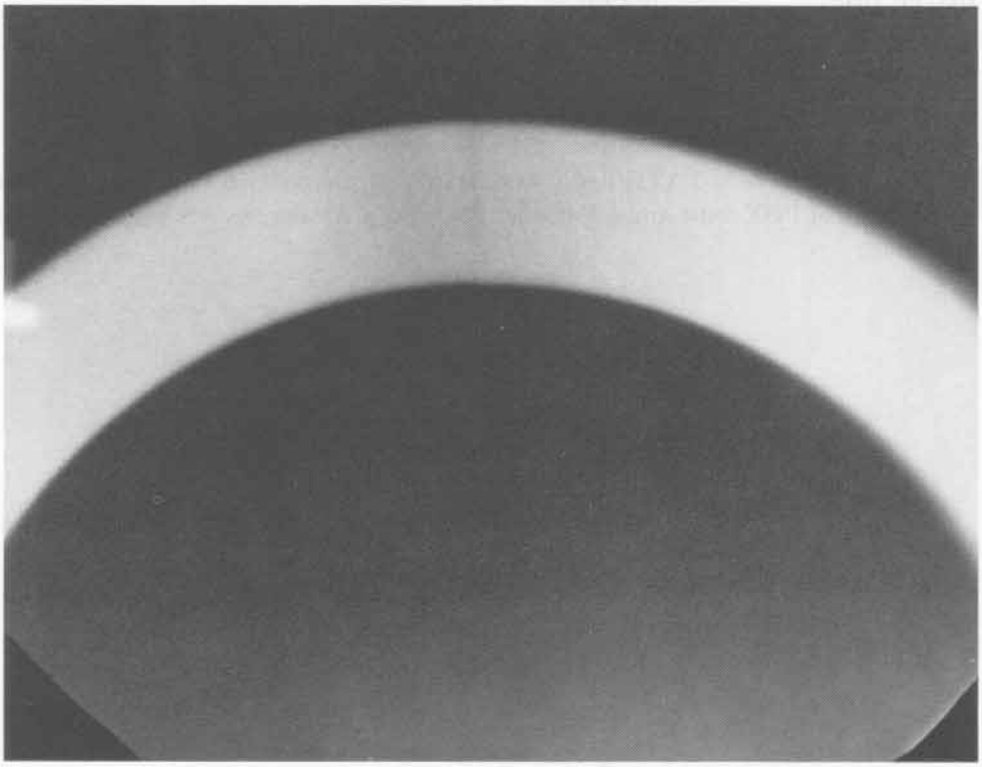
Date: June 19, 1975

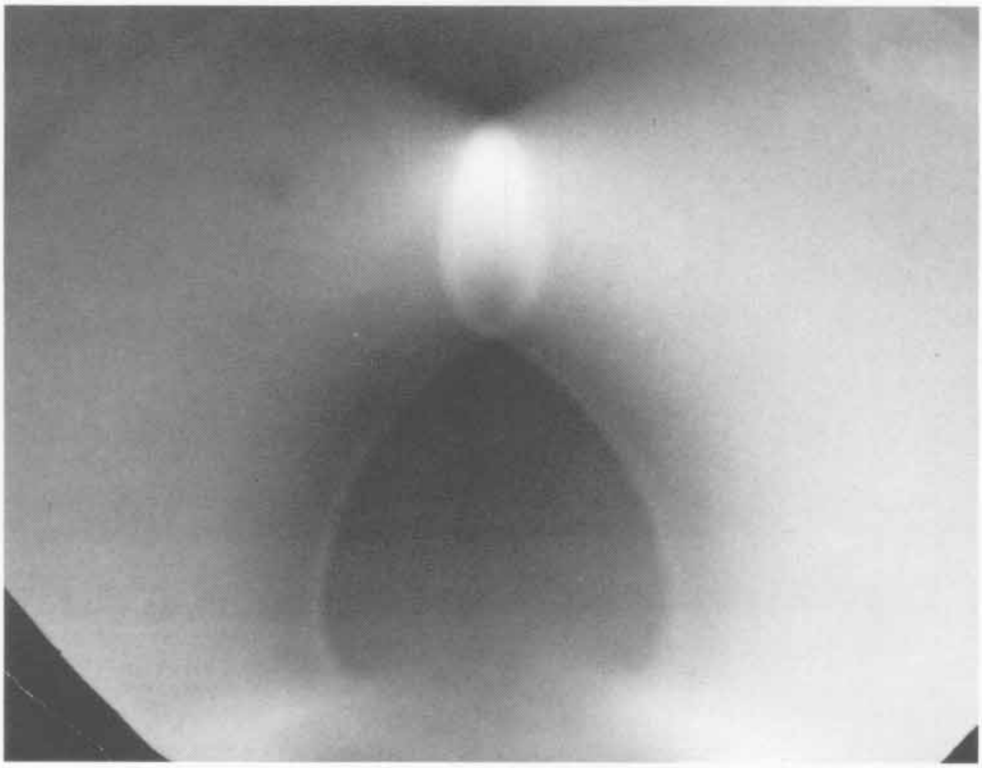
Experimenter: Richard D. Dick

Radiographic Time: 64.99 μs

Two diverging PBX-9502 (95/5 wt% TATB/Kel-F at 1.894 g/cm³) detonations formed by initiating the two ends of a PBX-9502 arc of 89.0-mm inner radius and 114.0-mm outer radius were radiographed while the detonations were colliding. See also Shot 1704. A step wedge used for density calibration is shown on top of the shot.







SHOT 1940: **TATB Turning a 90° Corner**

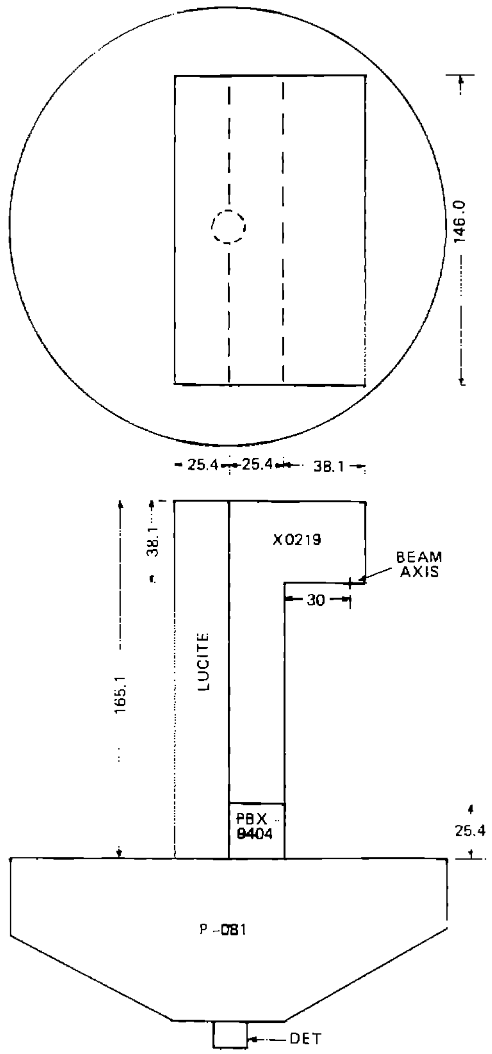
Date: June 24, 1975

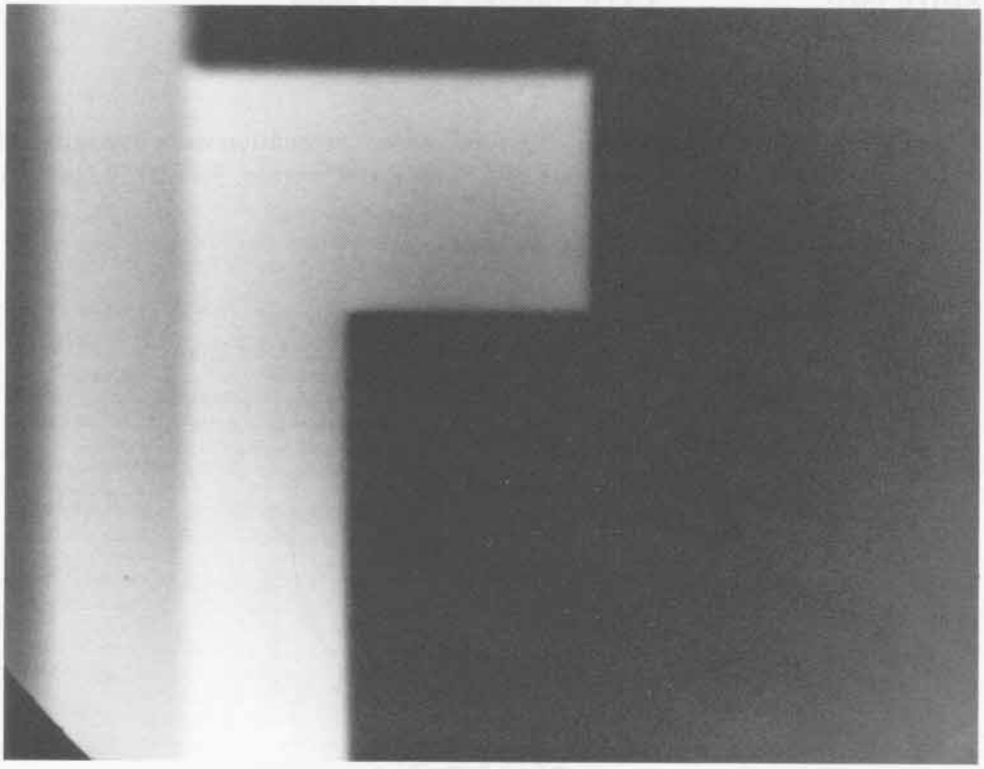
Experimenter: Richard D. Dick

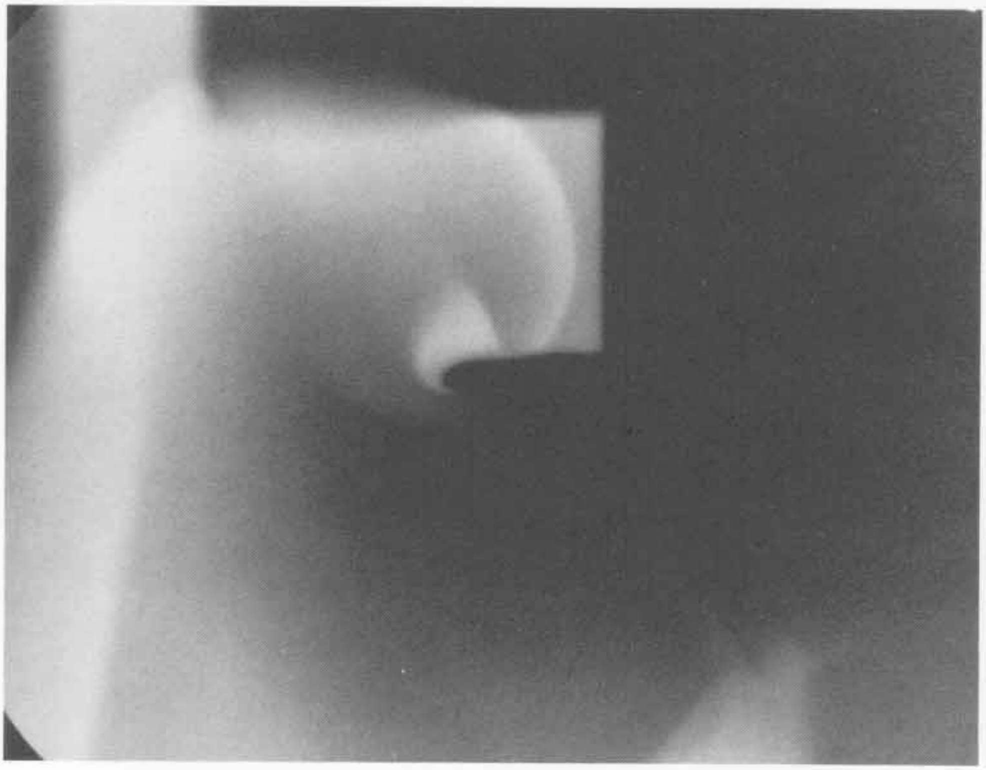
Radiographic Time: 46.12 μs

Reference: Mader, 1979

An X0219 (90/10 wt% TATB/Kel-F at 1.914 g/cm³) detonation wave was initiated by 25.4 mm of PBX-9404 and a P-081 lens turning a 90° corner. See also Shots 1936 and 1942.

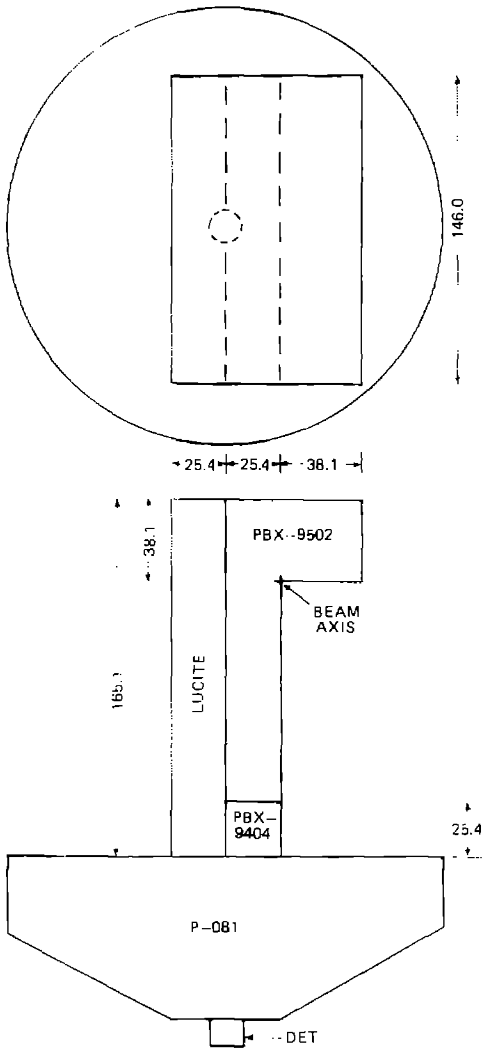


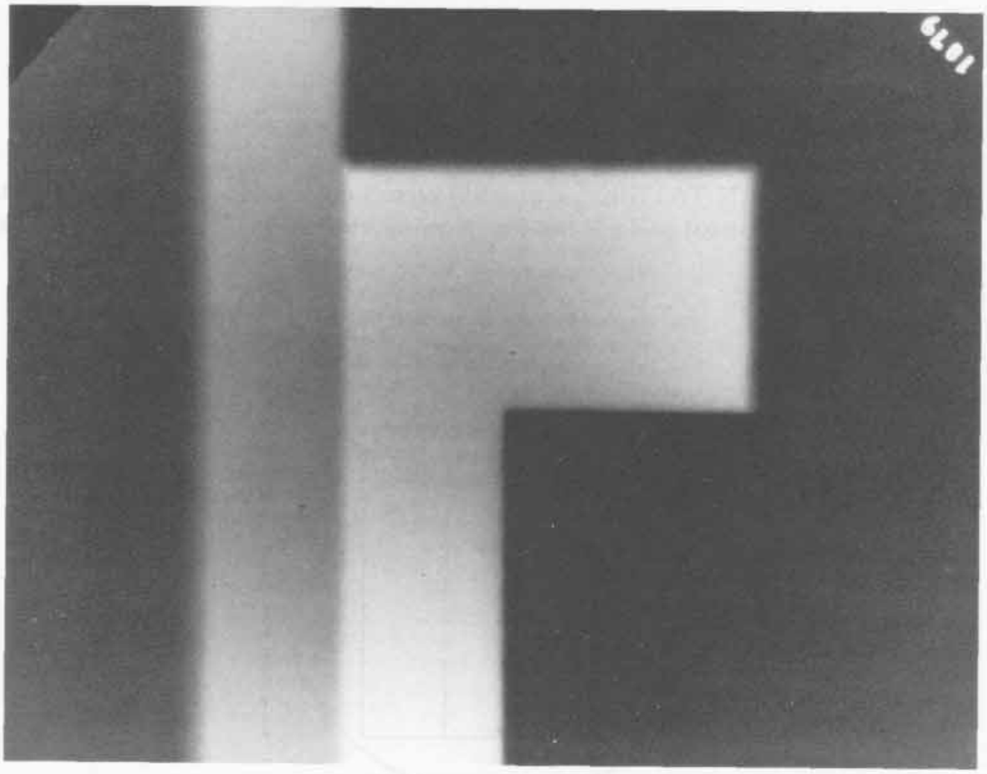


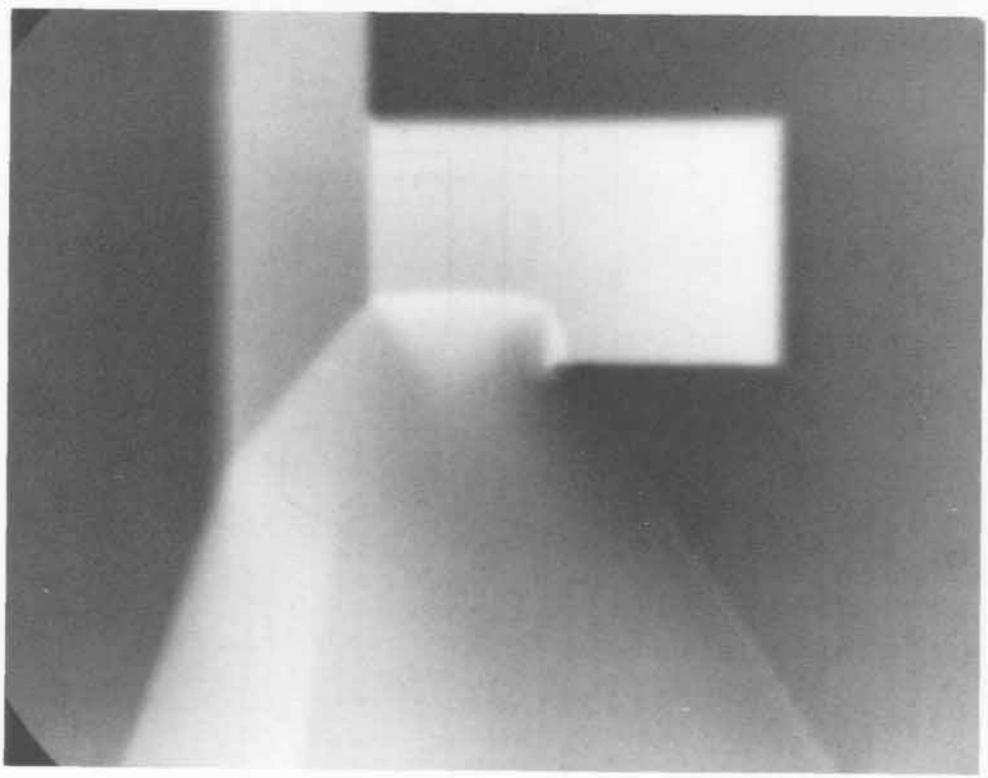


SHOT 1941: **TATB Turning a 90° Corner**
Date: June 24, 1975
Experimenter: Richard D. Dick
Radiographic Time: 41.08 μs

A PBX-9502 (95/5 wt% TATB/Kel-F at 1.895 g/cm³) detonation wave was initiated by 25.4 mm of PBX-9404 and a P-081 lens turning a 90° corner. See also Shots 1705, 1937, and 1943.







SHOT 1942: **TATB Turning a 90° Corner**

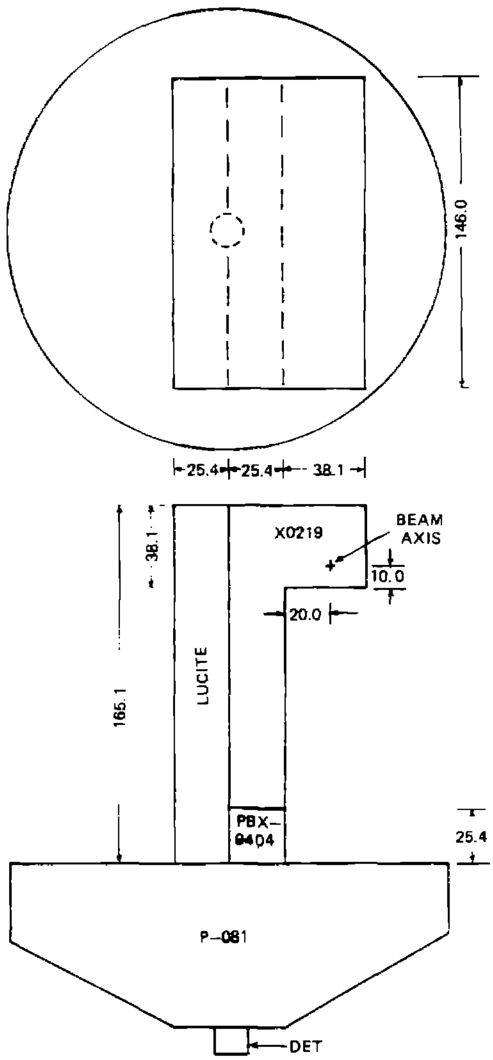
Date: July 2, 1975

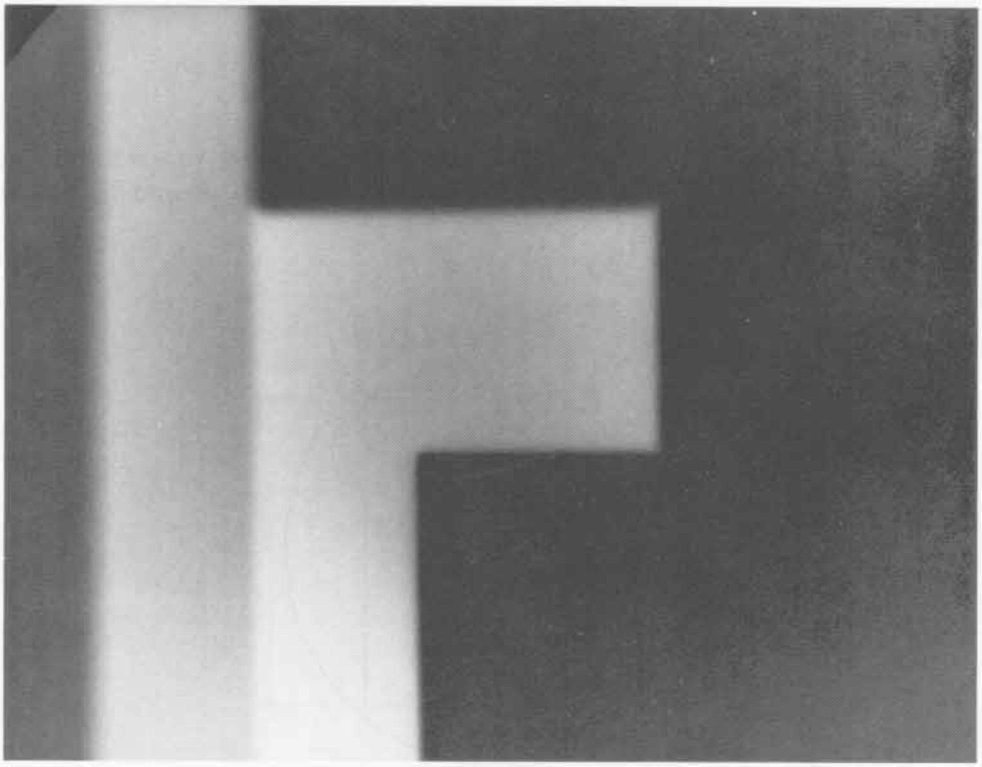
Experimenter: Richard D. Dick

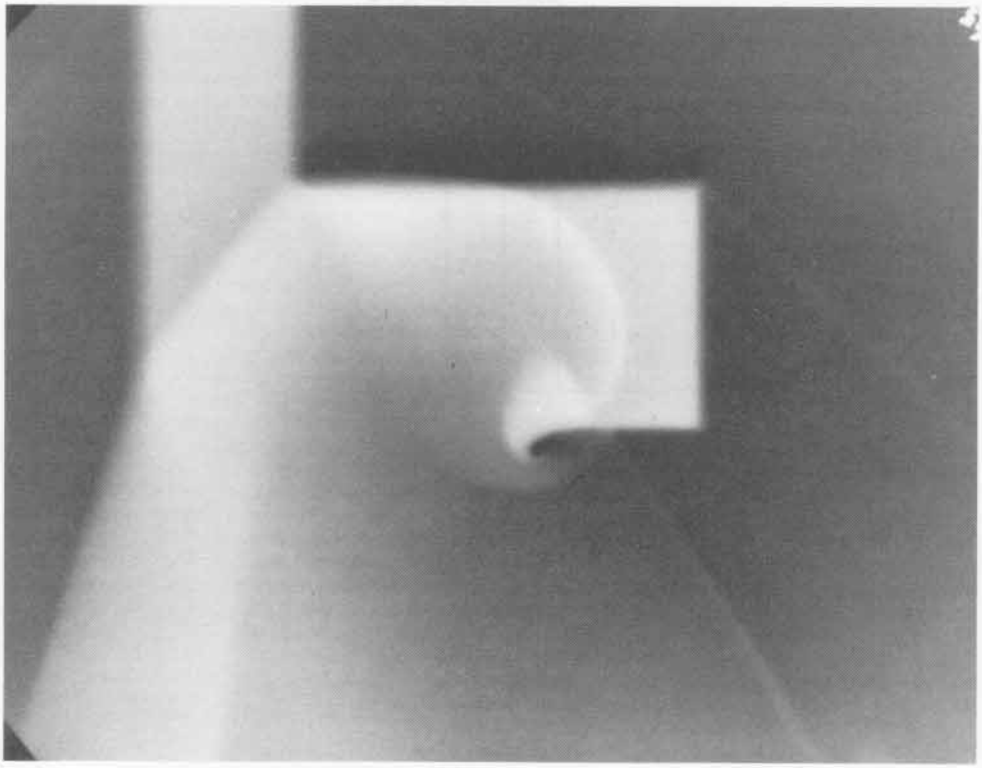
Radiographic Time: 45.12 μs

Reference: Mader, 1979

An X0219 (90/10 wt% TATB/Kel-F at 1.914 g/cm^3) detonation wave was initiated by 25.4 mm of PBX-9404 and a P-081 lens turning a 90° corner. See also Shots 1936 and 1940.







SHOT 1943: **TATB Turning a 90° Corner**
Date: July 2, 1975
Experimenter: Richard D. Dick
Radiographic Time: 44.57 μs

A PBX-9502 (95/5 wt% TATB/Kel-F at 1.895 g/cm³) detonation wave was initiated by 25.4 mm of PBX-9404 and a P-081 lens turning a 90° corner. See also Shots 1705, 1937, and 1941.