Secret

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Unique Document # SAB200087540000

This document consists of 126 pages,

[redacted]

V29469

RS 8182-1/89

ASSEMBLY BOOK DSP-201 Earth Penetrator (U)

VOLUME 1 OF 1

8182-1//000089

00010001 A

Sandia National Laboratories

DEPARTMENT OF ENERGY DECLASSIFICATION REVIEW

1ST REVIEW-DATE: 2-21-96	DETERMINATION [CIRCLE NUMBER(S)]
AUTHORITY: ☐ADC ☐ADC ☒ADD	1. CLASSIFICATION RETAINED
NAME: RH Amiley	2. CLASSIFICATION CHANGED TO:
2ND REVIEW-DATE: 3-28-05	3. CONTAINS NO DOE CLASSIFIED INFO
AUTHORITY: ADD	4. COORDINATE WITH:
NAME: Nancy Connelly	5. CLASSIFICATION CANCELLED
	6. CLASSIFIED INFO BRACKETED
	7. OTHER (SPECIFY): [redacted] CLASON fol.

PP: 2; 29-32; 57; 62; 64-68; 92-95; 97-99; 103-104; & 106-109

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Gayle Cain
CLASSIFIED BY

Division Supervisor
TITLE

8182 — ORG.

3/8/85 — DATE

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SF1005-1(7-73)

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ASSEMBLY RECORD

0003

DOCUMENT DATE	DRAWING NO.	ISSUE	PROGRAM NO.	UNIT NO.
4-16-85	A35783	A		DSP-201

NO. REC'D	DRAWING NUMBER	PART NAME	ITEM NO.	SERIAL NO.	WEIGHT	REC'D BY
1	A35237	CASE	1	003	265.6	fd
1	A35353	FWD COMPONENT SUPPORT A	2	None	138gm	fd
1	CD317130	MC3343	3	005	1	fd
1	A35307	FWD SUPPORT C010908	4	003	8	fd
1	A35290	TM FWD SUPPORT C010902	5	003	22.6	fd
1	A35342-A	ISOLATOR 1/4	6	None	41.8	fd
1		BAS TM ASSY	7	201	17.6	fd
1	A35286	AFT TM SUPPORT C010904	8	003	89.6	fd
1	A35335	PRELOAD RING, TM	9	None	1.2	fd
1	A35336	RETAINING NUT, TM	10	None	1.6	fd
1	A35343	FED THREADED RING	11	#3	2.4	fd
1	A35344	CAP	12	003	1.4 lb	fd
1	A35345	AFT SUPPORT	13	003	9.2	fd
1	A35346-A	AFT COMPONENT SUPPORT PLATE	14	None	5.2	fd
1	A35349-B	AFT COMPONENT SUPPORT A	15	None	5.6	fd
1	A34829	PWB STATIC TEST ASSY	16	—	4.8 lb	fd
1	A35786	AFT COMPONENT SUPPORT B	17	None	148gm	fd
1	A35347-A	AFT STIFFENER	18	None	6.2	fd
1	A35348-A	AFT THREADED RING	19	#3	1.6	fd
1	A35315	COVER	20	None	.6	fd
1	A35415	SPACER	21	None	.8	fd
1	A35392	KEY	22	None	6.3gm	fd
1	A35391	PLUG	23	None	135gm	fd

ASSEMBLED UNIT INSPECTED AND ACCEPTED FOR SHIPMENT

NAME	ORG.	DATE

TEST ASSEMBLY GROUP USE ONLY

ASSEMBLY START DATE	ASSEMBLY COMPLETION DATE

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LS 7812-U (11-84)

ASSEMBLY RECORD UNCLASSIFIED

0004

DOCUMENT DATE	DRAWING NO.	ISSUE	PROGRAM NO.	UNIT NO.
4-16-85	A35783	A		DSP-201

NO. REC'D	DRAWING NUMBER	PART NAME	ITEM NO.	SERIAL NO.	WEIGHT	REC'D BY
1	A35393	ADAPTER	24	None	176gm	fd
1	A35531	JAM NUT	25	None	23gm	fd
1	A35495	UMBILICAL SUPPORT, 15P	26			
1	A35380	FWD COMPONENT SUPPORT B	27	None	144gm	fd
1	A35496	UMBILICAL CLAMP, 15P	28			
ARS	A35753	SHIM	29			
1	A35463	ALIGNMENT KEY	30	None	26gm	fd
1	MS9388-019	O-RING	31			
1	A35361	PIN A, THREADED	32	None	17gm	fd
1	A35363	BLOCK	33	None	5.7	fd
1	A35362	PIN, THREADED B	34	None	22	fd
3		PCB 305, ACCELEROMETER	35			
4		SCREW,CAP,SOC.HD.	36	—	63.8	fd
6		SCREW,CAP,SOC.HD	37	—	16gm	fd
1		SCREW,CAP,SOC.HD	38	—	.8gm	fd
2		CABLE CLAMP	39			
2		SCREW,CAP,SOC.HD	40	—	4.9	fd
4		SCREW,CAP,SOC.HD	41	—	12.2	fd
2		SCREW,CAP,SOC.HD	42	—	14	fd
1	MS9388-032	O-RING	43			
1	MS9388-175	O-RING	44			
4	WK-06-125BZ-10C	STRAIN GAGE, MICRO MEASUREMENTS	45			
	A36086	SHIM GAGE	46			

ASSEMBLED UNIT INSPECTED AND ACCEPTED FOR SHIPMENT

NAME	ORG.	DATE

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ASSEMBLY START DATE	ASSEMBLY COMPLETION DATE

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0005

RS818 89

INFORMATION REQUIRED FOR DSP-200 SERIES TESTS

TEST NO.: R- 724201

TEST UNIT: DSP- 201

TARGET: ANTELOPE TUFF (DSP-200, #1)

TEST DATE: 7/11/85

TIME: 10:27 AM

A. BUILDING 9A

1. TOTAL ASSEMBLY WEIGHT: 514 LBS.

2. ASSEMBLY LENGTH: 47.775 INCHES

~4.0 FEET (3.98)

3. PENETRATOR BARREL LOCATION: 24.5 FEET
(BARREL EXIT TO OBTURATOR)

47.775 - 30 = 17.775

4. MARK FOR FIELD MEASUREMENT: 17.775 INCHES
(FROM NOSE)

5. FIELD MEASUREMENT FOR PENETRATOR BARREL LOCATION: 22 FEET

6. REACTION MASS LENGTH: 57 INCHES
57.14

4.75 FEET
4.76

7. REACTION MASS WEIGHT: 1808 LBS
(1800

UNIT	486.7	437
PUSHER + EYE & STRAP	58#	58
~~PLUS~~ SABOT	~~[illegible]~~ 7#	7
PLATE & OBTUR.	7#	7
		509

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B. TEST SITE (PRE TEST)

1. RANGE COORDINATES: X _____
Y _____

2. GUN AZIMUTH: 308 TRUE DEG. MAGNETIC 294°

3. ANGLE OF GUN BARREL TO TARGET: A = 60 DEG.

4. ANGLE OF TARGET TO HORIZON: B = 0 DEG.
(UPSLOPE AWAY FROM GUN IN POSITIVE)
(DOWNSLOPE AWAY FROM GUN IS NEGATIVE)

5. ANGLE OF GUN BARREL TO HORIZON: C = 60 DEG.
(C = A - B)

6. PROPELLANT TYPE: M30 WEB SIZE: .085 WEIGHT: 85 #
42.5
+ 42.5

7. IGNITER ASSEMBLY LENGTH: 42.5 INCHES

8. SPACING (IGNITER ASSEMBLY LENGTH + 2.5 INCHES): 45 INCHES
3.75 FEET

9. FIELD MEASUREMENT FOR PENERTRATOR LOCATION: 22.0 FEET
(FROM A.5)

10. PENETRATOR ANGULAR POSITION ERROR: 0° @ 355° DEG.
(+/- 5 DEGREES REQUESTED)

11. IMAGE MOTION CAMERA SET POINT: ~~30.0~~ 36.0 INCHES
(DISTANCE FROM BARREL EXIT)

12. VERTICAL ELEVATION AT SET POINT: EQ

13. VERTICAL ELEVATION OF IMAGE MOTION CAMERA: EQ

14. DISTANCE FROM GUN TO IMAGE MOTION CAMERA: 60' FEET

15. BREAKER BOARD SPACING (L1): ~~3.98~~ FEET 12' 4½" 12.375 ft

16. ASSEMBLY LENGTH (L2): 3.98 FEET
(FROM A.2)

17. DISTANCE FOR VELOCITY MEASUREMENT: 8.395 FEET
(L1 - L2)

RSR 89

C. DATA DURING TEST (22,500 TO 23,000 RAYWOOD QUICK LOOK 20,770 WHITEY)

1. BARREL PRESSURE: 22.23 PSI

2. BREAKER BOARD TIME (T): _____ MS

3. DISTANCE FOR VELOCITY MEASUREMENT (D): 8.395 FEET (FROM B.17)

4. BREAKER VELOCITY: 1812 FPS

$$V = \frac{1000\ D}{T} \simeq \frac{8400}{T}$$

D. TEST SITE (POST TEST)

1. ANGLE OF GUN TO HORIZON: 60°-4' DEG. (COMPARE WITH B.5)

2. DOPPLER VELOCITY: Didn't work METERS / SEC.

(TIMES 3.281): NA FPS

E. PHOTOGRAPHY LAB (POST TEST)

1. IMAGE MOTION VELOCITY: #1 1905(N) FPS 1900 QUICK LOOK

#2 ~1990(S) FPS NOT TO USE*

AVG. 1905 FPS

*SOUTH CAMERA FILM BLURRY BECAUSE SLIT NOT INSTALLED.

ANGLE OF ATTACK = 0 FROM FILM STRIPES (BLACK) ON BOARD

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JAN COLLINS INPUT

F. RECOVERY

1. CRATER DIMENSIONS

DEPTH: 26.5 INCHES

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WIDTH: 56.0 INCHES

LENGTH: 58.0 INCHES

2. PENETRATION ANGLE: 57° DEG.

3. LOCATION OF AFT END OF PENETRATOR

PATH LENGTH: 10.58 FEET

DEPTH: 8.25 FEET (8.87' CALC.)

HORIZONTAL DISTANCE: _____ FEET (5.76' CALC.)

4. REST ANGLE

PITCH: 57.8° DEG. (60.5° - 2.68° = 57.82°)

YAW: — DEG.

5. LOCATION OF NOSE

PATH LENGTH: 14.28 FEET

DEPTH: 11.42 FEET (11.98' CALC.)

HORIZONTAL DISTANCE: _____ FEET (7.78' CALC.)

6. LATERAL DEVIATION: — FEET

7. GENERAL DESCRIPTION OF TRAJECTORY.
THE PENETRATOR FOLLOWED A STRAIGHT TRAJECTORY

8. GENERAL CONDITION OF TEST UNIT AFTER TEST.
IN GENERAL THE TEST UNIT WAS IN GOOD CONDITION. THERE WAS SOME SLIGHT DEFORMATION ON THE AFT END OF THE PENETRATOR AT THE 180° MARK AND SOME MATERIAL WAS SCRAPED OFF OF THE AFT THREADS WHERE THE PUSHER PLATE MOUNTS.

9. GENERAL CONDITON OF PUSHER PLATE.
THE PUSHER PLATE WAS IN GOOD CONDITION. IT WAS LOCATED DOWN HOLE APPROX. 2 FEET FROM THE AFT END OF THE PENETRATOR.

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FSCM NO. 14214

J.E.COLLINS,8152,x2159
D.DIEMER,8272
AM

0009

ASSEMBLY PROCEDURE, DSP-201 EARTH PENETRATOR

Page	1	2	3	4	5	6	7	8	9
Issue	B	A	A	A	B	B	B	B	A

Design Agency Control Number	Issue	Release/Change No.	Date
SS-A35783-000	A		02-12-85
	B		05-01-85

RS8182-1-89

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0010

1. GENERAL.

1.1 Scope. This specification and drawing A35783 define the minimum requirements for the assembly of the DSP-201 earth penetrator.

1.2 Verification of Performance. All assembly steps and verification checks shall be initialed, in the space provided, by the person completing the activity.

1.3 Deviations. Significant deviations from these procedures or drawing A35783 shall be documented by a waiver signed by the responsible engineer. Sequence of assembly is not mandatory.

1.4 Loctite. Apply Loctite 242 to all threaded fasteners that do not have self-locking features, unless otherwise specified.

1.5 Torque Table.

TABLE 1. TIGHTENING TORQUE FOR SCREWS

Screw Size	Torque (pound-inches)
.086-56 (2-56)	2
.112-40 (4-40)	5-7
.138-32 (6-32)	8-9
.164-32 (8-32)	16-18
.190-24 (10-24)	18-20
.190-32 (10-32)	28-30
.250-20 (1/4-20)	60-65
.250-28 (1/4-28)	80-90
.312-24 (5/16-24)	11 pound-feet
.375-16 (3/8-16)	17 pound-feet
.375-24 (3/8-24)	19 pound-feet
.500-20 (1/2-20)	40 pound-feet
.500-13 (1/2-13)	38 pound-feet
.375-24 (3/8-24) Lug Bolts	36 pound-feet

2. DOCUMENTS AND EQUIPMENT

2.1 The following document forms a part of this specification to the extent stated herein.

A35783 DSP-201 Assembly

2.2 The following equipment is required for the inspection and assembly of the DSP-201 earth penetrator.

A33472 Assembly Stand
A35535 Preloading Assembly, DSP-201
A35562 Preloading Assembly "B", DSP-201
A35653 Pulling Fixture, DSP-201
A35590 Lifting Plate
A35589 Umbilical Wrench
A35540 Wrench, TM Nut
A35661 Mandrel, DSP-201
A35704 Threaded Rod, DSP-201

0011

3. Requirements.

3.1 Inspection of Parts.

a. A mold of the inside forward section of the case (A35237) is required for inspection.

1. Vapor degrease the case, mold mandrel (A35661), and threaded rod (A35704). (Vapor degrease down use Acetone Flair

2. Cover the inside of the case with fluorocarbon mold release (SNLL Cat. No. 678036). Do not use a silicone mold release.

3. Mount the case in the assembly stand and position the case nose down and in a vertical position.

4. Insert the mold mandrel into the case and check the mandrel for proper alignment.

(a) Spray the threaded end of the threaded rod with mold release. DC-7

(b) Insert the threaded rod into the center of the mandrel and tighten it until it bottoms out on the case, but does not lift the mandrel.

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5. Pot the inside forward section of the case using one of the following compounds:

(a) DC 3110 Mold Compound

(b) Salastic J

(c) RTV 630

Fill the case until the compound is approximately 14.20" from the aft end of the case.

6. Allow the compound to cure.

7. Mark the mold to indicate the zero degree and 180 degree marks with respect to the case.

8. Remove the mold from the case.

(a) Remove the rod assembly.

(b) Mount the pulling fixture (A35653) and remove the mold from the case.

9. Mark the mold with the appropriate mating case number (DSP-201, DSP-202, etc.).

10. Remove the case from the assembly stand and ship the case and mold to Division 8184-2 for inspection.

3.1 continued

b. Have all the parts inspected. K 5 8 1 8 2 - 1 · 8 9

c. Reject all parts not meeting the drawing specifications.
1. Dye penetrant inspect the case OK 68 Sco

d. Preassemble all parts to determine if they fit properly.

e. Determine and document the weight of each component in the DSP-201 assembly.

f. Clean all parts for assembly. The fluorocarbon mold release can be removed with acetone.

3.2 Fit Checking and Shimming the TM Support Assembly.

a. Mount the forward support (A35307) to the TM forward support (A35290) using two 1/4-28 x 1" long S.H.C.S. Torque the screws to 80 pound-inches.

b. Install threaded pin "A" (A35361) into plug (A35391).

c. Install plug (A35391) into the aft TM support (A35286) using two 10-32 x 1/2" long S.H.C.S. Torque to 20 pound-inches.

d. Attach the aft TM support (A35286) to the forward TM support assembly.

(see notes) .032 [illegible]

Place shims (A35753) between the forward TM support and the aft TM support until there is approximately .002" clearance between the case and the aft TM support shoulder when the forward TM support shoulder bottoms on the case. Use four 3/8-24 x 5/8" long S.H.C.S. to attach the aft TM support the forward TM support. Torque to 19 pound-feet.

.001 to .003 clearance

e. Attach the lifting plate (A35590) to the aft TM support (A35286).

f. Lower the TM support assembly into the case, checking the angular orientation and the clearance between the case supporting shoulders and the TM support assembly. Use Plastigauge to check the clearance. Note the distance from the aft end of the case to pin "A" (A35361).

dis. 12.301

g. Remove the TM support assembly.

h. Remove the forward suport (A35307) from the TM support assembly.

3.3 Forward TM Support Assembly (A35290).

a. Install accelerometer AZ-1 (PCB 305). Torque the accelerometer To 15 pound-inches. Record model number and serial number. Pack cotton around the accelerometer and its leads to 1/2 inch from the top of the access hole.

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Model No. pcb 305 M34 Serial No. 3819

b. Mount forward support (A35307) using two 1/4-28 x 1" long (Pot with sly gard 184) S.H.C.S. Torque the screws to 80 pound-inches.

0013

c. Install accelerometer AX-1 (PCB 305). Torque the accelerometer to 15 pound-inches. Record model number and serial number. Bond the leads to the flat surface inside the forward TM support, using the bonding agent depicted in 3.3.h.

Model No. 305M34 Serial No. 3821

d. Tape the accelerometer leads such that they will not be broken during the remainder of the assembly of the forward TM support.

e. Assemble the mock-up section. Ray Gott of Division 8315 will be responsible for the potting operations.

1. Check the mock-up for the addition of two 1/4" diameter steel bars at right angles. Mount the mock-up in the forward component support "A" (A35353) and "B" (A35380). Use Sylgard 184 shims to centralize the mock-up in the foam. Remove aft component support "B". Pot the mock-up into forward component support "A" using Sylgard 184. Allow the potting material to cure, then pot the mock-up into the aft component support "B". RS8182-1-89

2. Place the mock-up assembly into the cover (A35315). Use Sylgard 184 shims to centralize the mock-up assembly foam inside the cover. Pot the assembly with Sylgard 184. The zero degree mark inside the case must be aligned with the mark on the aft end of the mock-up assembly. Attach the cover to the forward support using 4 10-32 x 5/8" long S.H.C.S. Torque to 20 pound-inches. Allow potting material to cure. Done By Potting lab.

f. Pot accelerometer AZ-1. The Sylgard 184 should be poured until it is flush with the outer surface of the forward TM support.

g. Pot accelerometer AX-1 and pot the leads where they penetrate the forward TM support walls.

Apply Sylgard primer inside the hole in the forward TM support before applying Sylgard 186.

h. Bond accelerometer leads from AX-1 and AZ-1 to the side of the wire groove in the TM support assembly. Do not attach the wires past Sta. 31.15.

The bonding agent used to attach the leads consists of the following:

1. Ten parts of EPON 828.
2. One part of CAB-O-SIL.
3. Six parts of Versamid 125 (hardening agent).

Ray Gott will supply the materials and complete the bonding operation.

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3.4 Case Strain Gauge Installation

a. Mount the strain gauges at S1 through S5. Berry Green will install the strain gauges.

5/6/85 [illegible]

S1 Level ± 10,000 μE .999kΩ

S2 Level ± 10,000 μE .999kΩ

S3 Level ± 10,000 μE .999kΩ

S4 Level ± 10,000 μE .999kΩ

S5 Level ± 10,000 μE 1000Ω

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b. Adhere the strain gauge wires to the inside of the case such that they fall within the wire groove of the TM support assembly. Do not attach the wires past Sta. 30.40. Use the same bonding agent that was used to attach the accelerometer leads.

3.5 Potting TM Support Assembly to the Case.

a. Spray fluorocarbon mold release on the exterior of the TM support assembly.

b. Place enough Sylgard 184 in the forward end of the case to fill to station 31.15 after assembly with the TM support. (Approximately 24.2 cubic inches.)

c. Install the TM support assembly, being careful to control the angular orientation.

d. Remove the lifting plate.

e. Install cap (A35344).

f. Install the preloading assembly (A35535) without the weldment assembly (A35545).

g. Press the TM support assembly until the aft TM support shoulder is .002 " from the case. Check the distance from the aft end of the case to pin "A" to determine if the TM support assembly is in the proper position.

h. Position the strain gauge and accelerometer wires and remove the excess potting material.

i. Check the continuity of the forward accelerometers & strain gauges.

j. Allow the potting compound to cure for 16 hours.

k. Remove the preloading assembly.

l. Remove the cap and place the strain gauge and accelerometer wires inside the TM cavity.

m. Install the cap and insert the aft support (A35345).

3.5 continued

0015

n. Attach the weldment assembly (A35545) to the forward thread ring (A35343).

o. Install the forward thread ring and tighten with the weldment assembly.

p. Ship the case assembly to Division 8444, Building 923, for radiography.

3.6 Radiography

RS81 1-89

a. Radiograph the mock-up section of the penetrator. The TM package shall not be installed and the accelerometers will be shielded with lead when being x-rayed. The time required for radiography is approximately two days. The cobalt 60 machine will be used; 1.25 mev gamma rays. (Lutz Dahlke, 8444, is the contact.) 6500 08/07/85

b. Ship the case assembly to Building 913, Room 106F, when radiography is completed.

3.7 TM Installation. (H. D. "Whitey" Sorenson will conduct TM installation and checks.)

A-35342-A .250

a. Install insolator (A35342) into the aft TM support.

b. Insert the BAS-TM into the aft TM support. Record the data recovery system serial number. Serial Number 201.

c. Install the alignment key (A35463) into the aft TM support.
install J-2 to P-2 + J-3 to P3

d. Install the TM preload ring (A35335) into the aft TM support.

e. Install the TM retaining nut (A35336) into the aft TM support.

1. Attach the TM nut wrench (A35540) to the retaining nut with 5/16 - 24 UNF x 3/4" long S.H.C.S.

2. Install the TM retaining nut and torque to ___pound-feet.
60

3. Remove the TM nut wrench.

f. Attach the cable assemblies to the TM package.

g. Install the cable clamps on the preload ring. E.G.

h. Install the solder tabs and make the strain gauge and accelerometer connections (leads for AZ-2). Bond the strain gauge and accelerometer leads to the aft hemisphere area in the slots.

i. Place the compression pads over the solder tabs.

j. Spray mold release on cap (A35344). Install the cap using 10-32 x 1/2" long S.H.C.S. Torque to 20 pound-inches.

k. Position the umbilical cable and install the cable clamp on the cap using 10-32 x 3/8" long S.H.C.S.

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2.16 mm
cellular silicone
Bx. 4003040

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3.7 continued

1. Add Sylgard 184 to fill the voids around the aft TM support and on the accelerator and strain gauge leads.

m. Install the aft support (A35345) and the forward threaded ring (A35343). Position the umbilical cable and AZ-2 leads.

n. Install the preload assembly and preload the aft support to 14,000 psi. Tighten the forward threaded ring to 3 pound-feet. *Used a bar.

3.8 Aft Component Support Plate

a. Install accelerometer AZ-2 (PCB 305) to the aft component support plate (A35346) and torque to 15 pound-inches. Install the solder tab. Bond the wires to the plate surface and fill the recess with Sylgard 184. Record the model number and serial number of the accelerometer.

Model Number Pcb 305 M-34 Serial Number 3820

b. Install the threaded pin "B" (A35362) to the aft component support plate using block (A35363).

3.9 Aft Section Assembly

a. Insert the foam spacer (A35415) while positioning the umbilical cable and the TM leads to AZ-2.

b. Insert 0.005 inch thick Mylar shim (A36086) and the aft component support plate assembly and position the wiring. Fill the space between the case and the edge of the component support plate with Sylgard 184. D.C.

1. Connect AZ-2 to a solder tab.

2. Pot the wires. Bond the wires to the plate surface and fill the hole in the aft component support plate and the spacer with Sylgard 184.

c. Insert the aft component support "A" (A35349). J.C.

Route the umbilical cable through the cable way.

d. Install the PWB static test assembly (A34829) and the aft component support "B" (A35786). J.C.

Place mylar shims under the PWB static test assembly until aft component support "B" is flush with aft component "A".
Used Pad from B-83
Total thickness of shim stock used = _____.

e. Fasten the key (A35392) to the aft stiffener (A35347) using 6-32 x 5/16" long S.H.C.S. Torque to 9 pound-inches.

F. Back fill cable way with Sylgard 186

0318

f. Install the aft stiffener (A35347) and check the clearance between the stiffener and foam parts. Shim the aft end of the foam parts with mylar until ~10,000 pounds of force is required to bottom the stiffener on the shoulder of the case. Use preloading assembly "B" (A35562) for loading. ____

Total thickness of shim stock used = N/A

g. Remove the preloading assembly "B", aft stiffener and shims. ____

h. Solder the leads from the umbilical connector to the solder tab. BG

i. Replace the shims. N/A

j. Install the O-ring on the aft stiffener. & ADAPTER ~~dd~~

k. Install the aft stiffener. ~~dd~~

Position the umbilical connector in the "D" hole and attach to the aft stiffener with jam nut (A35531).

l. Install the aft threaded ring (A35348). ~~dd~~

m. Install preloading assembly "B". Preload the aft assembly to ~~~10,000~~ 16,000 LBS and tighten the aft threaded ring. ~~dd~~

3.10 ~~Accelerometer Response Testing.~~ INSTALL NUT ON ADAPTER & TORQUE TO 90 # - INCHES ____

3.11 Painting of Penetrator. Paint the penetrator per SNLL drawing (A35706). ____

3.12 Photographs. Photograph the penetrator at various stages of assembly (subassembly levels, instrumentation stages, etc.). ____

3.13 Mass Properties Tests

a. Send the penetrator to Durwood "Woody" Green, Building 978, for mass properties testing. ____

b. Measure and record the following mass properties: ____

Weight _____ lbs.

Longitudinal C.G. _____ inches

Moment of inertia

Roll _____ lb. in^2

Pitch _____ lb. in^2

Yaw _____ lb. in^2

4. NOTES

None

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44.40
- 24.65
19.75

- ~~35.375~~
.903

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21.184 / 21.189

7.697

21.1865
- 7.697
13.4895

ADD .002 SHIM

TOTAL SHIMS = .032

450
1800

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Case 21.2144
7.6974
13.5170
13.4885
.0285

Mold 22.8660
8.3775
13.4885

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with .060 shim

13.5170
.060
13.4570 — No shim

13.4885
13.4570
00.0315-

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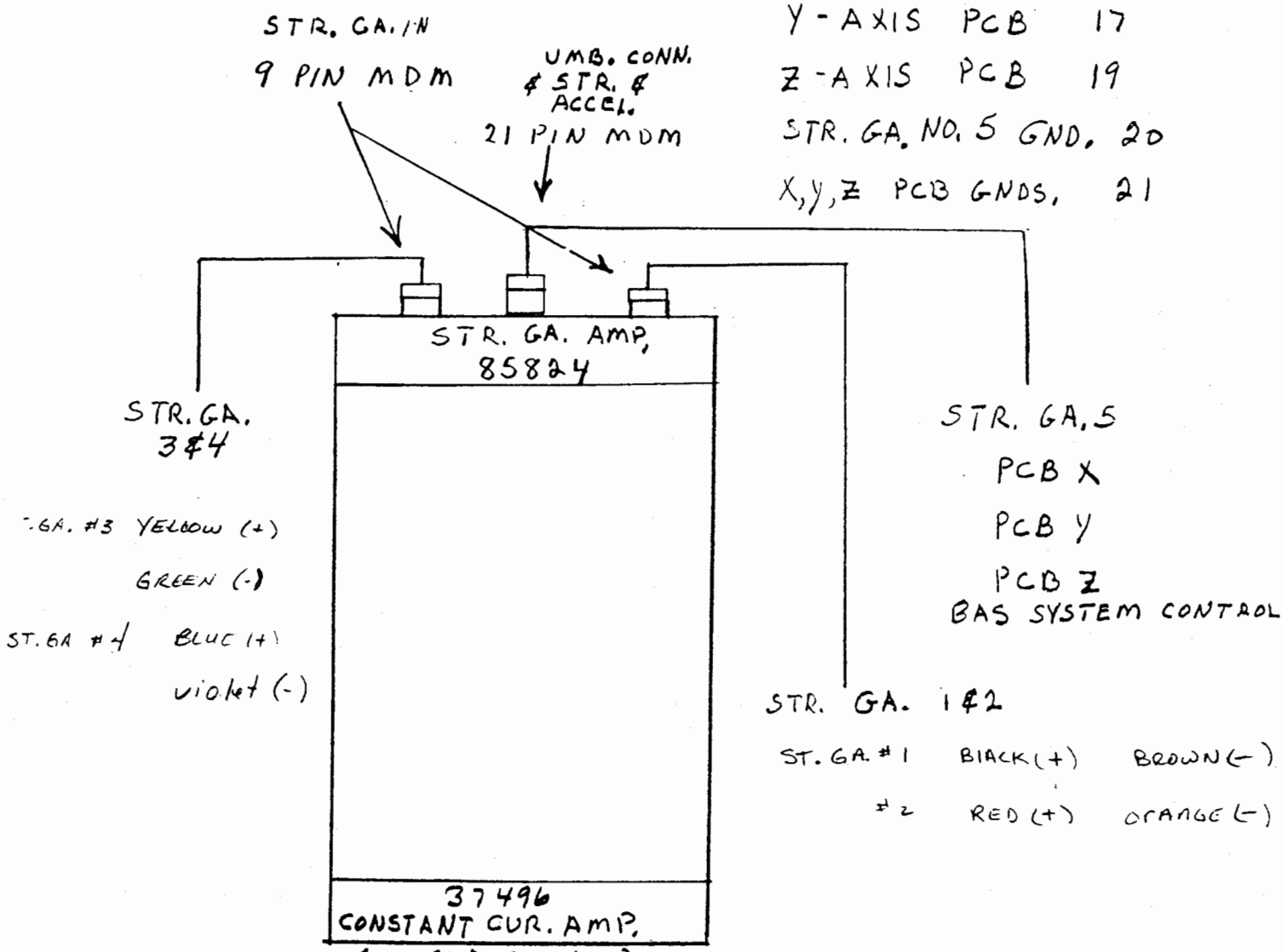
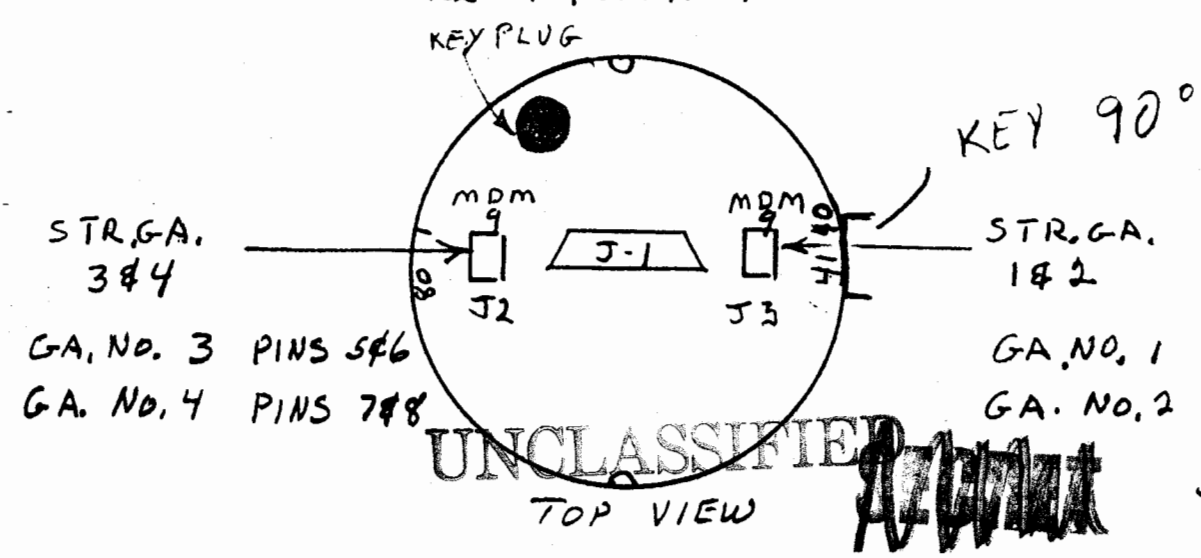
0021

RS8182-1-89

MDM PIN ASSIGNMENTS

STR. GA. NO. 5	18
X - AXIS PCB	16
Y - AXIS PCB	17
Z - AXIS PCB	19
STR. GA. NO. 5 GND.	20
X, Y, Z PCB GNDS.	21





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5-5-85
WOOD

6463-E

~~SECRET~~ UNCLASSIFIED

STRAIN GAGE APPLICATION REQUEST

0022

Requester D. Clark Org. 8152 Ext. 3118

Case No. 0562.000 Date Requested 4-26-85 Required 4-30-85

Item DSP-201 Ser. No. 3 Quantity 1

Material ST. Temperature Coefficient

Drawing No. A33679 Part Classification

Sketch

RS8182-1·89

Environments

Temperature Humidity

Type of Test Shock

Estimated Strain Duration of Test

Leads: Type PVC-2 Wire Length As Required

Gage Resistance 1000Ω

Gage: WK-06-125AC-10C GF = 2.08 ± 1.0%

Adhesive: M Bond-200

Completion Date: 4-30-85

Installation Details:

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~~SECRET~~

		Required	Actual
S1	0°	25.0"	25.0"
S2	180°	25.0"	24.9"
S3	0°	15.0"	15.0"
S4	180°	15.0"	14.9"
S5	0°	19.75"	19.70"

0023

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AXIAL LOCATION OF STRAIN GAUGES

RS8182-1·89

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COLOR CODE OF STRAIN GAUGE WIRES

S2 = YEL & ORG
S4 = RED & BRN } @ 180°

S1 = RED & BRN
S3 = RED & BRN
S5 = YEL & ORG } @ 0°

RS8182-1·89

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Sandia National Laboratories

Livermore, California 94550

0025

date: December 3, 1984

to: D. J. Timmer, 8182

from: D. A. Clarin, 8152

RS8182-1-89

subject: DSP-201, DSP-202, and DSP-203 Calibration Levels

Calibrate strain gages at ± 10,000 micro strain for all three units.

Set accelerometer calibration levels as follows:

Test Unit	Axial (G)	Lateral (G)
DSP-201	+10,000 -20,000	± 12,000
DSP-202	+4,000 -9,000	± 9,000
DSP-203	+10,000 -20,000	± 15,000

DAC:8152:rh

Copy to:
M. M. Hightower, 5341
W. R. Wood, 5142
W. R. Bolton, 8152
[redacted]
A. R. Ortega, 8152
H. D. Sorenson, 8173
D. C. Stoner, 8173-1
M. L. Chiesa, 8241
D. A. Clarin, 8152

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Accelerometer Calibration

Mfg. PCB MOD 305 M34

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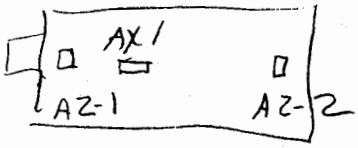
N	LOCATION	°F TEMP.	pC/g. SENS.	mV/g*	Remarks
3819	AZ-1	RMB		.0654	@ 100 Hz ~~200~~ 10 G
3820	AZ-2	"		.0668	
3821	AX-1	"		.0615	
			RS8182	1-89	

AZ-1
AZ-2
AX-1



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By

Date 4/29/85

SNLL E463-1 Page No.

INSTRUMENTATION CHECK LIST

Program _____

Test Unit _____

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Designator	Model No.	S/N	Location/ Station	Cal. Sheet	Photo Taken	Cable Connect. Verified	Date	Remarks B/A	Remarks A/A
AX-1	PCB 305 M-34	3821	X axes 14.6875	✓	✓			920 Ω	
AZ-1	"	3819	Z axes 13.875	✓	✓			915 Ω	
				RS818-1-89					
AZ-2	"	3820	Z axes 36.875	✓	✓			913 Ω	

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0028

Sandia National Laboratories
Albuquerque, New Mexico 87185
Livermore, California 94550

date: June 25, 1985

to: W. R. Bolton - 8152
Attn: J. E. Collins

from: P. D. Gildea - 8183

RS8182-1-89

subject: Mass Properties Experimental Determination

Ref. 9965002

1.0 Program No. SEP Part No. DSP-201

2.0 Results

2.1 Weight: 446.70 ± 0.45 lbs. true mass

2.2 Centers of Gravity

(A) XBAR = 19.928 ± 0.005 in. forward from aft of projectile

(B) YBAR = 0.000 ± 0.002 in. on geometric centerline

(C) ZBAR = 0.001 ± 0.002 in. towards 0 deg. from geometric center

(D) RBAR = 0.001 in. @ 354 deg.

2.3 Moments of Inertia, about Ref. Axis through its Centers of Gravity

(A) IXX = 5,924.0 lb-in^2 (1.27864 slug ft^2) ± 0.5%

(B) IYY = 54,717.7 lb-in^2 (11.81029 slug ft^2) ± 0.5%

(C) IZZ = 54,726.3 lb-in^2 (11.81214 slug ft^2) ± 0.5%

2.4 Products of Inertia - Not Requested

2.5 Projectile Length = n/reqd ± 0.005 in.

Test Conductor: D. ~~P.~~ Green - 8183/mam,(Mass2#74)

Log No. 1957

Copy to:
S. G. Cain, 8182
K. L. Tschritter, 8182-1
P. D. Gildea, 8183

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INSPECTION REPORT

ALTEC

9901 TRUMBULL, S.E.
ALBUQUERQUE, NM 87123
PHONE (505) 298-7581

ALTEC JOB NO. 6557
NOMENCLATURE SABOT
DRAWING NO. DM 850508
TOTAL QUANTITY 2
DATE 5-23-85

CUSTOMER P.O. NO. 97-3556
ITEM NO. 1
ISSUE NO. A
PARTIAL NO. —
QUANTITY INSPECTED 1

SPECIFICATION	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10
.120/.080	.090									
3.030/2.970	2.971									
1.250/1.150	1.150									
10.930/10.870	10.930									
8.983/8.993	8.983									
23.020/22.980	22.985									
11.133/11.143	11.145									
37. ± .01	.37									
.370/.380	.370									
11.975/11.965	11.973									
MARK	✓									

Sheet 1 of 1

Inspected by: CSD

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R58182-1.89

0033

```
==============================================================================
*DRAWING #: A35237, REVISION 'B'                  *SERIAL #:                  *
*PART NAME: CASE (DSP-201)                        *OPERATOR: K.A.HONTZ        *
*           J.COLLINS EXT. 2159                   *    DATE: 04/22/85         *
------------------------------------------------------------------------------
*DIMENSIONS: INCHES                                                          *
==============================================================================
```

RS8182-1-89

```
==============================================================================
 ______FEATURE_____ :          :          :      :      :          :        :        :
 No. : M*M # : Type : ACTUALS :NOMINALS :+ TOL.:- TOL.:          :Dev.Nom:Dev.Tol:
==============================================================================


                STYLUS STACK CLEARED

                BALL STYLUS # 0 QUALIFIED, DIA =    .7087",N = 15

  1      1/16  -X PLANE

                X AXIS ORIENTED

                X ORIGIN SET

                ICS->PCS
                PCS  1 ESTABLISHED

                TOLERANCING: ON

==============================================================================
 ______FEATURE_____ :          :          :      :      :          :        :        :
 No. : M*M # : Type : ACTUALS :NOMINALS :+ TOL.:- TOL.:          :Dev.Nom:Dev.Tol:
==============================================================================


                BALL STYLUS # 0 QUALIFIED, DIA =    .7052",N = 15

  2      2/32  ID YZ CIRCLE
                 DIA=   9.4010    9.4000    .0040  0.0000           .0010       +
                   Y=  -3.9548
                   Z= -15.5262

                YZ ORIGIN SET
                PCS  2 ESTABLISHED
                 RND=   8.6636

  3      3/32  ID YZ CIRCLE
                 DIA=   9.1612    9.1600    .0040  -.0040           .0012      ++
                   Y=   -.0002
                   Z=    .0002
                 RND=    .0028

                BALL STYLUS # 0 QUALIFIED, DIA =    .7042",N = 15

  4      4/32  ID YZ CIRCLE
                 DIA=   9.0825    9.0820    .0020  -.0020           .0005       +
                   Y=   -.0006
                   Z=    .0019
                 RND=    .0024

  5      5/32  ID YZ CIRCLE
                 DIA=   8.7558    8.7550    .0050  -.0050           .0008       +
```

```
                Z=     .0019
              RND=     .0022

              BALL STYLUS # 0 QUALIFIED, DIA =     .6980",N = 20

  6     6/32  ID YZ CIRCLE
               DIA=   8.6240    8.6240    .0020  -.0020          0.0000       +
                 Y=   -.0007
                 Z=   -.0012
```

RS8182-1·89

```
              BALL STYLUS # 0 QUALIFIED, DIA =     .7087",N = 15

************** RECOVERED AT FEATURE # 6

=================================================================================
 ______FEATURE______ :          :          :      :      :        :       :       :
 No. : M*M # : Type : ACTUALS :NOMINALS :+ TOL.:- TOL.:        :Dev.Nom:Dev.Tol:
=================================================================================

              BALL STYLUS # 0 QUALIFIED, DIA =     .0379",N = 15

  7     7/ 1  -X POINT
                X=   -3.4947   -3.4950    .0050  -.0050          -.0003       -

  8     8/ 1  -X POINT
                X=   -4.3424   -4.3450    .0050  -.0050          -.0026     ---

  9     9/ 1  -X POINT
                X=  -10.2030

 10           PTP DIST
                X=  -5.8606   -5.8700    .0100  -.0100          -.0094    ----

 11    10/ 1  -X POINT
                X=   -9.7039

 12           PTP DIST
                X=    .4991     .5000    .0100  -.0100          -.0009       -

 13    11/ 1  -X POINT
                X=  -12.8386

 14    12/ 1  -X POINT
                X=  -10.2036

 15           PTP DIST
                X=   2.6350    2.6250    .0250  -.0250           .0100      ++

 16    13/ 1  -X POINT
                X=   -4.8381

 17    14/ 1  -X POINT
                X=   -4.3426

 18           PTP DIST
                X=    .4955     .4900    .0250  -.0250           .0055       +
```

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```
=================================================================================
*DRAWING #: A35237, REVISION 'B'                  *SERIAL #: MOLD DIM'S          *
*PART NAME: CASE (DSP-201)                        *OPERATOR: K.A.HONTZ           *
*           J.COLLINS EXT. 2159                   *    DATE: 04/22/85            *
---------------------------------------------------------------------------------
*DIMENSIONS: INCHES                                                              *
=================================================================================
```

K58182-1-89

```
=================================================================================
 ______FEATURE______ :          :          :      :      :          :       :       :
 No. : M*M # : Type : ACTUALS :NOMINALS :+ TOL.:- TOL.:          :Dev.Nom:Dev.Tol:
=================================================================================


                STYLUS STACK CLEARED

                BALL STYLUS # 0 QUALIFIED, DIA =    .3144",N =  5

  1      1/32  OD YZ CONE

                X AXIS ORIENTED

                YZ ORIGIN SET

  2      2/16  +X PLANE

                Y & Z AXES ALIGNED

                X ORIGIN SET
                PCS  1 ESTABLISHED

                TOLERANCING: ON

                PCS 1 TRANSLATED BY
                X=   18.7500
                Y=    0.0000
                Z=    0.0000
                PCS  2 ESTABLISHED

=================================================================================
 ______FEATURE______ :          :          :      :      :          :       :       :
 No. : M*M # : Type : ACTUALS :NOMINALS :+ TOL.:- TOL.:          :Dev.Nom:Dev.Tol:
=================================================================================


  3      3/ 4  OD YZ CIRCLE
                 DIA=   7.2355    7.2420    .0080  0.0000          -.0065  -.0065
                   Y=   -.0045
                   Z=    .0030

                PCS   1 RECALLED

                PCS 1 TRANSLATED BY
                X=    1.0000
                Y=    0.0000
                Z=    0.0000
                PCS  3 ESTABLISHED

  4      4/32  OD YZ CONE
                 DIA=   8.1303    8.1340    .0050  -.0050          -.0037     ---
               Pierce Point
                   Y=   -.0056
```

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```
          Attitude
           AX/Y=  179.953
           AX/Z=  179.929
           ay/z=   56.053
          Included Angle
           IANG=    7.929      8.000      .500   -.500          -.071       -

           PCS   1 RECALLED

           PCS 1 TRANSLATED BY
           X=   -9.0000
           Y=    0.0000
           Z=    0.0000
           PCS  4 ESTABLISHED

5    RCL    OD YZ CONE(1)
            DIA=   6.7282    6.7380    .0100  -.0100          -.0098    ----
          Pierce Point
              Y=   0.0000
              Z=   0.0000
          Attitude
           AX/Y= -180.000
           AX/Z=  180.000
           ay/z=  180.000
          Included Angle
           IANG=    8.052      8.000      .500   -.500           .052       +

           PCS   2 RECALLED

           PCS   1 RECALLED

6     5/ 1  +X POINT
              X=  -13.4838  -13.4840    .0040  -.0040          -.0002       -

7     6/ 1  +X POINT
              X=  -17.0508

8           PTP DIST
              X=  -3.5670   -3.5660    .0060  -.0060           .0010       +

9     7/16  OD YZ CIRCLE
            DIA=   5.6110    5.6200    .0050  -.0050          -.0090  -.0040
              Y=   -.0001
              Z=    .0002

10    8/16  OD YZ CIRCLE
            DIA=   4.5103    4.5150    .0050  -.0050          -.0047    ----
              Y=    .0046
              Z=   -.0022
```

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```
==============================================================================
*DRAWING #: A35290, REVISION 'A'                  *SERIAL #: 3                 *
*PART NAME: FWD TM SUPPORT (DSP-20)               *OPERATOR: K.A,H.     X8-22186 *
*           D.CLARIN, EXT.3118                    *RUN DATE: 12/03/84          *
------------------------------------------------------------------------------
*DIMENSIONS: INCHES                                                           *
------------------------------------------------------------------------------
*TEMP COMP MATL:  NONE                            *PGM NAME: A35290            *
*     EXP COEFF:  NONE                            * PROGRMR: K.A.H.     X8-22186 *
*SHRINK  FACTOR:  NONE                            *PGM DATE: 12/03/84          *
==============================================================================

==============================================================================
 _______FEATURE_____ :          :          :       :       :          :        :
 No. : M*M # : Type : ACTUALS :NOMINALS :+ TOL.:- TOL.:         :Dev.Nom:Dev.Tol:
==============================================================================


  1       1/8   -Z PLANE

                Z AXIS ORIENTED

                STYLUS 4 ACTIVE

  2       2/4   +Z PLANE

                Z ORIGIN SET

                STYLUS 0 ACTIVE

  3       3/4   ID XY CIRCLE

  4       4/4   ID XY CIRCLE

                X & Y AXES ALIGNED

  5       5/40  OD XY CIRCLE

                XY ORIGIN SET
                PCS  1 ESTABLISHED


                TOLERANCING: ON

  6       6/40  OD SPHERE
                 DIA=   6.5082    6.5020  +0.0050  -0.0050        0.0062   0.0012
                   X=  -0.0001 -  0.0000  +0.0050  -0.0050       -0.0001        -
                   Y=   0.0000    0.0000  +0.0050  -0.0050        0.0000        +
                   Z=  10.6952   10.6920  +0.0050  -0.0050        0.0032      +++
```

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```
                X=    0.0000
                Y=    0.0000

 8      RCL    Z PLANE(1)
              Pierce Point
                Z=  11.7544   11.7500  +0.0050  -0.0050        0.0044     ++++
              Attitude
               ax/y=    0.000
               AX/Z=   90.000
               AY/Z=   90.000

               Z ORIGIN SET
               PCS  2 ESTABLISHED

               TP/MMC TOLERANCING

 9      RCL    ID XY CIRCLE(3)
                DIA=   0.3163    0.3150  +0.0050  -0.0050        0.0013       ++
                  X=   1.7490    1.7500   NPD/M=   0.0140 PAX/Y=   -169
                  Y=  -0.0002 -  0.0000   EPD/M=   0.0203 APD/M= 0.0020        +

10      RCL    ID XY CIRCLE(4)
                DIA=   0.3160    0.3150  +0.0050  -0.0050        0.0010        +
                  X=  -1.7518   -1.7500   NPD/M=   0.0140 PAX/Y=   -174
                  Y=  -0.0002 -  0.0000   EPD/M=   0.0200 APD/M= 0.0036        +

               STYLUS 2 ACTIVE

               LINEAR TOLERANCING

11      7/4    ID YZ CIRCLE
                DIA=   0.6289    0.6250  +0.0100  -0.0100        0.0039       ++
                  Y=  -0.0021
                  Z=   0.1271    0.1250  +0.0050  -0.0050        0.0021       ++

               STYLUS 4 ACTIVE

12      8/4    ID YZ CIRCLE
                DIA=   0.1909    0.1900  +0.0050  -0.0050        0.0009        +
                  Y=   0.0008
                  Z=  -1.2802   -1.2800  +0.0050  -0.0050        0.0002        +

13      9/30   OD XY CIRCLE
                DIA=   7.2225    7.2300  +0.0050  -0.0050       -0.0075  -0.0025
                  X=   0.0012
                  Y=   0.0006

14     10/30   OD XY CIRCLE
                DIA=   6.7991    6.7960  +0.0040  -0.0000        0.0031     ++++
                  X=   0.0008
                  Y=   0.0003

               SWITCHED TO POLAR

15     11/8    OD XZ CYLINDER
                DIA=   0.2013
              Pierce Point
                  r=  12.2508
               AX/Z=  -89.934
              Attitude
               AX/Y=   45.166   45.000   +0.500   -0.500         0.166       ++
               ax/z=   -0.022
               AY/Z=   -0.022
```

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0039

RS8182-1.89

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STYLUS 2 ACTIVE

UNCLASSIFIED

0040

16 12/8 OD YZ CYLINDER
DIA= 0.2007
Pierce Point
r= 12.2497
AY/Z= -89.917
Attitude
AX/Y= 135.122 135.000 +0.500 -0.500 0.122 +
AX/Z= -179.991
ay/z= -0.009

KS8182-1·89

17 13/8 OD XZ CYLINDER
DIA= 0.2009
Pierce Point
r= 12.2498
AX/Z= -90.022
Attitude
AX/Y= -134.972 -135.000 +0.500 -0.500 -0.028 -
ax/z= 179.979
AY/Z= 179.979

STYLUS 4 ACTIVE

18 14/8 OD YZ CYLINDER
DIA= 0.2020
Pierce Point
r= 12.2466
AY/Z= -90.033
Attitude
AX/Y= -45.024 -45.000 +0.500 -0.500 0.024 +
AX/Z= -0.015
ay/z= -179.985

PCS # 1 RECALLED

19 15/4 +Z PLANE
Pierce Point
Z= -1.0792 -1.0700 +0.0100 -0.0100 0.0092 ++++
Attitude
ax/y= -3.229
AX/Z= -89.771
AY/Z= -90.013

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A35286-A	S/N 001	S/N 002	S/N 003	
4.057 Dim @ 6.980 Loc.	6.910	6.874	6.890 0041	
4° ANGLE	✓	✓	✓	
ϕ 4.610/4.605 (ZONE 'A')	✓	✓	✓	
ϕ 4.615/4.605	✓	✓	✓	
ϕ 6.815/6.805	✓	✓	✓	
7.703/7.693 Dim	7.691	✓	✓	
1.12/1.10	✓	✓	✓	
ϕ 2.76/2.74	✓	✓	✓	
* 17.51/17.49 Dim.	17.542	17.537	17.461	17.507
.41/.39 Dim.	✓	✓	~~.486~~	.406s
2.02/1.98 Dim.	2.036	2.028	~~1.949~~	2.026
ϕ 3.865/3.855	3.8543	3.8615 ~~3.8524~~	~~3.8514~~	3.856
ϕ 4.015/4.005	~~3.997/4.012~~ 4.013/4.013	3.9953/4.010	~~3.999/4.010~~ 4.012/4.013	
#10-32 Holes, 4PL.	See Printout	4.013/4.013		
#3/8-24 Holes, 4PL	See Printout	—	—	
4.302 SPH Radius @ 3.208 Loc.	4.3068 @ 3.2098 Loc.			
2.245/2.255 Dim	✓			
.755/.745 Dim	.756			

RS8182-1-89

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A35286-A	S/N 001	S/N 002	S/N 003
4.057 Dim @ 6.980 Loc.	6.910	6.874	6.890
4° ANGLE	✓	✓	✓
ϕ 4.610/4.605 (ZONE 'A')	✓	✓	✓
ϕ 4.615/4.605	✓	✓	✓
ϕ 6.815/6.805	✓	✓	✓
7.703/7.693 Dim	7.691	✓	✓
1.12/1.10	✓	✓	✓
ϕ 2.76/2.74	✓	✓	✓
* 17.51/17.49 Dim.	17.542	17.537	17.461
.41/.39 Dim.	✓	✓	.486
2.02/1.98 Dim.	2.036	2.028	1.949
ϕ 3.865/3.855	3.8543	3.8524	3.8514
ϕ 4.015/4.005	3.997/4.012	3.9953/4.010	3.999/4.010
#10-32 HOLES, 4PL.	SEE PRINTOUT	—	—
#3/8-24 HOLES, 4PL	SEE PRINTOUT	—	—
4.302 SPH RADIUS @ 3.208 LOC.	4.3068 @ 3.2098 LOC.	4.3027 @ 3.2047	4.3033 @ 3.2066
2.245/2.255 DIM	✓	2.272	✓
.755/.745 DIM	.756	.757	✓

RS 8182-1-89

AET 7M SUP TR S8182-1-89
A35286 A

FEATURE No.	M*M #	Type	ACTUALS	NOMINALS	+ TOL.	- TOL.		Dev.Nom	Dev.Tol
		STYLUS 0 ACTIVE							
1	1/ 8	-Z PLANE							
		Z AXIS ORIENTED							
2	2/ 1	-Z POINT							
		Z ORIGIN SET							
3	3/ 6	ID XY ELLIPSE							
4	4/ 6	ID XY ELLIPSE							
		X & Y AXES ALIGNED							
		XY ORIGIN SET PCS 1 ESTABLISHED							
		TOLERANCING: ON							

FEATURE No.	M*M #	Type	ACTUALS	NOMINALS	+ TOL.	- TOL.		Dev.Nom	Dev.Tol
		S/N 003							
5	RCL	Z PLANE(1)							
		Pierce Point							
		Z=	7.6976	7.6980	.0050	-.0050		-.0004	-
		Attitude							
		ax/y=	0.000	0.000	0.000	0.000		0.000	0.000
		AX/Z=	90.000	90.000	0.000	0.000		0.000	0.000
		AY/Z=	90.000	90.000	0.000	0.000		0.000	0.000
6	5/ 4	-Z PLANE							
		Pierce Point							
		Z=	6.5962						
		Attitude							
		ax/y=	70.677						

0044

```
            AY/Z=    89.862

 7          PTP DIST
               Z=  -1.1014   -1.1000    .0100  -.0100          .0014      +

 8    RCL   ID XY ELLIPSE(3)
             DIA=   6.8063    6.8100    .0050  -.0050         -.0037     ---
               X=    .0017     .0017    .0100  -.0100         0.0000      +
               Y=   0.0000    0.0000    .0100  -.0100         0.0000      +

 9    RCL   ID XY ELLIPSE(4)
             DIA=   2.7473    2.7500    .0100  -.0100         -.0027     --
               X=   0.0000    0.0000    .0100  -.0100         0.0000      +
               Y=   0.0000    0.0000    .0100  -.0100         0.0000      +

10     6/ 4  -Z PLANE
            Pierce Point
               Z=  17.9461
            Attitude
             ax/y=   32.597
             AX/Z=   89.999
             AY/Z=   90.000

             STYLUS 1 ACTIVE

11     7/ 4  +Z PLANE
            Pierce Point
               Z=  17.4605   17.5000    .0100  -.0100         -.0395  -.0295
            Attitude
             ax/y= -123.725  -123.725    0.000   0.000          0.000   0.000
             AX/Z=  -90.065   -90.065    0.000   0.000          0.000   0.000
             AY/Z=  -90.097   -90.097    0.000   0.000          0.000   0.000

12          PTP DIST
               Z=   -.4856    -.4000    .0100  -.0100          .0856   .0756

13     8/ 1  +Z POINT
              Z=   15.5111

14          PTP DIST
               Z=  -1.9494    -.2000    .0200  -.0200         1.7494  1.7294
```

RS8182-1-89

UNCLASSIFIED

0045

AFT TM SUPT

A35286A

RS8182-1-89

FEATURE No.	M*M #	Type	ACTUALS	NOMINALS	+ TOL.	- TOL.		Dev.Nom	Dev.Tol
		STYLUS 0 ACTIVE							
1	1/16	-Z PLANE							
		Z AXIS ORIENTED							
		Z ORIGIN SET							
2	2/ 8	+X PLANE							
		X & Y AXES ALIGNED							
3	3/16	ID XY CIRCLE							
		XY ORIGIN SET PCS 1 ESTABLISHED							
		TOLERANCING: ON							
		TP/MMC TOLERANCING							
		SWITCHED TO POLAR							

FEATURE No.	M*M #	Type	ACTUALS	NOMINALS	+ TOL.	- TOL.		Dev.Nom	Dev.Tol

S/N [redacted] 003

UNCLASSIFIED

4	4/ 4	OD XY CIRCLE							
		DIA=	.1997	.2000	.0010	-.0010		-.0003	--
		r=	2.2426	2.2500	NPD/M=	.0140	PAX/Y=	-116	
		AX/Y=	59.986	60.000	EPD/M=	.0153	APD/M=	.0148	++++

```
                 r=   2.2514    2.2500    NPD/M=  .0140   PAX/Y=   -138
              AX/Y=  150.110   150.000    EPD/M=  .0151   APD/M=  .0091     +++

 6      6/ 4  OD XY CIRCLE
                DIA=    .1999     .2000    .0010  -.0010          -.0001
                 r=   2.2555    2.2500    NPD/M=  .0140   PAX/Y=   -160
              AX/Y= -120.117  -120.000    EPD/M=  .0151   APD/M=  .0143    ++++

 7      7/ 4  OD XY CIRCLE
                DIA=    .1998     .2000    .0010  -.0010          -.0002       -
                 r=   2.2484    2.2500    NPD/M=  .0140   PAX/Y=   -130
              AX/Y=  -30.238   -30.000    EPD/M=  .0152   APD/M=  .0190   .0038

 8      8/ 4  OD XY CIRCLE
                DIA=    .1997     .2000    .0010  -.0010          -.0003      --
                 r=   2.4249    2.4375    NPD/M=  .0140   PAX/Y=   -110
              AX/Y=   29.752    30.000    EPD/M=  .0153   APD/M=  .0328   .0175

 9      9/ 4  OD XY CIRCLE
                DIA=    .1998     .2000    .0010  -.0010          -.0002       -
                 r=   2.4341    2.4375    NPD/M=  .0140   PAX/Y=   -111
              AX/Y=  120.098   120.000    EPD/M=  .0152   APD/M=  .0108     +++

10     10/ 4  OD XY CIRCLE
                DIA=    .1999     .2000    .0010  -.0010          -.0001       -
                 r=   2.4438    2.4375    NPD/M=  .0140   PAX/Y=   -158
              AX/Y= -150.021  -150.000    EPD/M=  .0151   APD/M=  .0127    ++++

11     11/ 4  OD XY CIRCLE
                DIA=    .1996     .2000    .0010  -.0010          -.0004      --
                 r=   2.4354    2.4375    NPD/M=  .0140   PAX/Y=   -164
              AX/Y=  -60.197   -60.000    EPD/M=  .0154   APD/M=  .0173   .0019

==================================================================================
 ______FEATURE_____ :          :          :       :       :          :       :       :
 No. : M*M # : Type : ACTUALS :NOMINALS :+ TOL.:- TOL.:          :Dev.Nom:Dev.Tol:
==================================================================================


              STYLUS 1 ACTIVE

12     12/ 2  2PT Z SLOT
                 W=   2.2540
                 Z=  -1.7653

13     13/ 2  2PT X SLOT
                 W=    .7528
                 X=   -.0006

              SWITCHED TO CARTESIAN

14     14/ 6  ID XZ CIRCLE
                DIA=    .6247     .6300    .0050  -.0050          -.0053  -.0003
                 X=   -.0019    0.0000    NPD/M=  .0140   PAX/Z=   -119
                 Z=  -1.7634   -1.7600    EPD/M=  .0140   APD/M=  .0078     +++

              STYLUS 0 ACTIVE

15     15/50  OD SPHERE
                DIA=   8.6067
                 X=   -.0002
                 Y=    .0001
                 Z=  -3.2066
```

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KS8182-1.89

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0047

CAP

A35344

Rev. A

58182-1-89

FEATURE No.	M*M #	Type	ACTUALS	NOMINALS	+ TOL.	- TOL.	Dev.Nom	Dev.Tol
6	6/ 4	-Z PLANE						
		Pierce Point						
	#1	Z=	.8563	.8370	.0050	-.0050	.0193	.0143
		Attitude						
		ax/y=	-26.873	-26.873	0.000	0.000	0.000	0.000
		AX/Z=	89.977	89.977	0.000	0.000	0.000	0.000
		AY/Z=	90.011	90.011	0.000	0.000	0.000	0.000
7	7/ 4	-Z PLANE						
		Pierce Point						
	#2	Z=	.8498	.8370	.0050	-.0050	.0128	.0078
		Attitude						
		ax/y=	-105.350	-105.350	0.000	0.000	0.000	0.000
		AX/Z=	90.012	90.012	0.000	0.000	0.000	0.000
		AY/Z=	90.043	90.043	0.000	0.000	0.000	0.000
8	8/ 4	-Z PLANE						
		Pierce Point						
	#3	Z=	.8494	.8370	.0050	-.0050	.0124	.0074
		Attitude						
		ax/y=	-147.823	-147.823	0.000	0.000	0.000	0.000
		AX/Z=	90.031	90.031	0.000	0.000	0.000	0.000
		AY/Z=	90.019	90.019	0.000	0.000	0.000	0.000

~~SECRET~~

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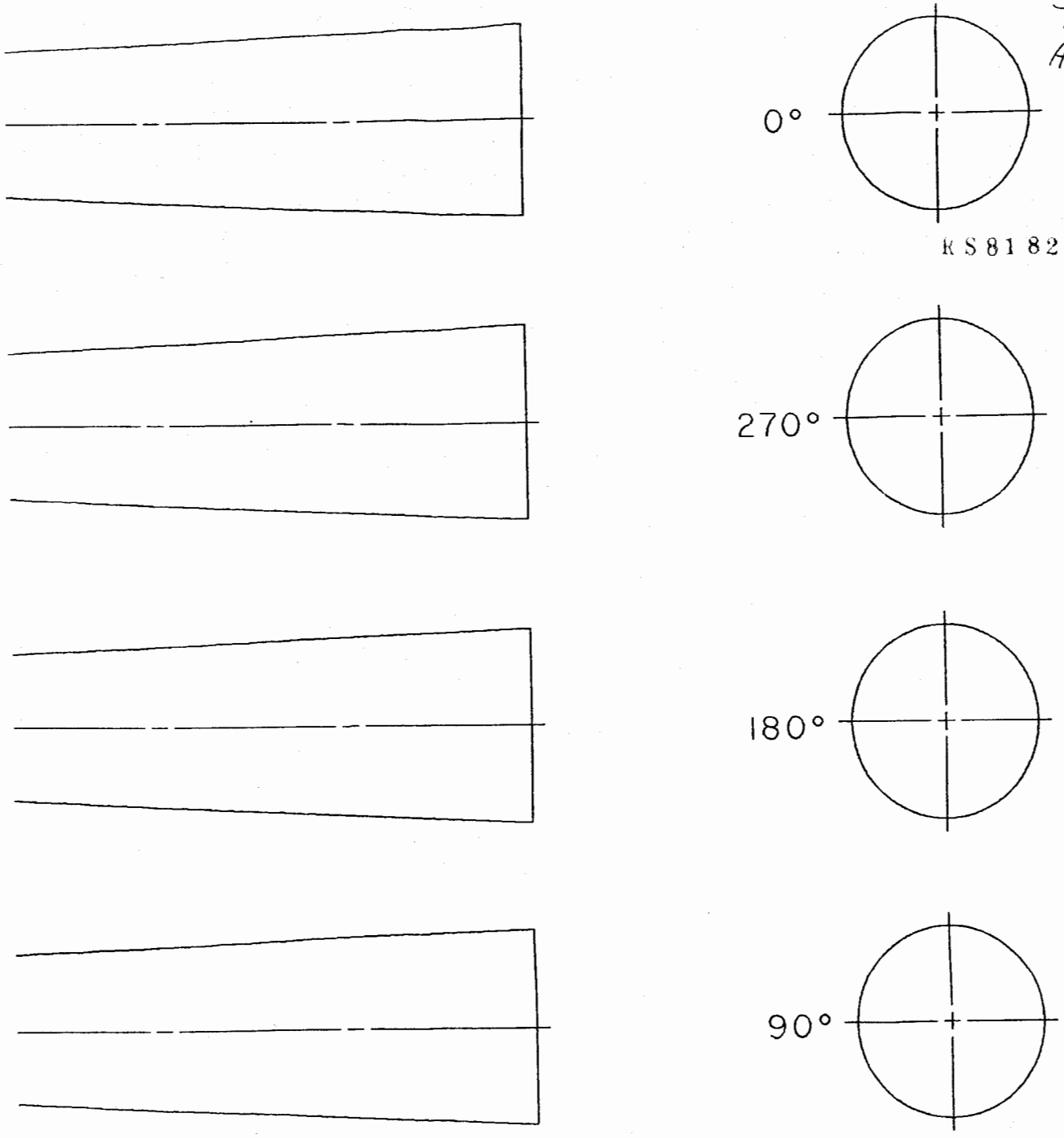
S/N 003
0048
After Machine Shc
NO Crack like
INDICATIONS
found
Acceptable
G.P Soo
04/23/83



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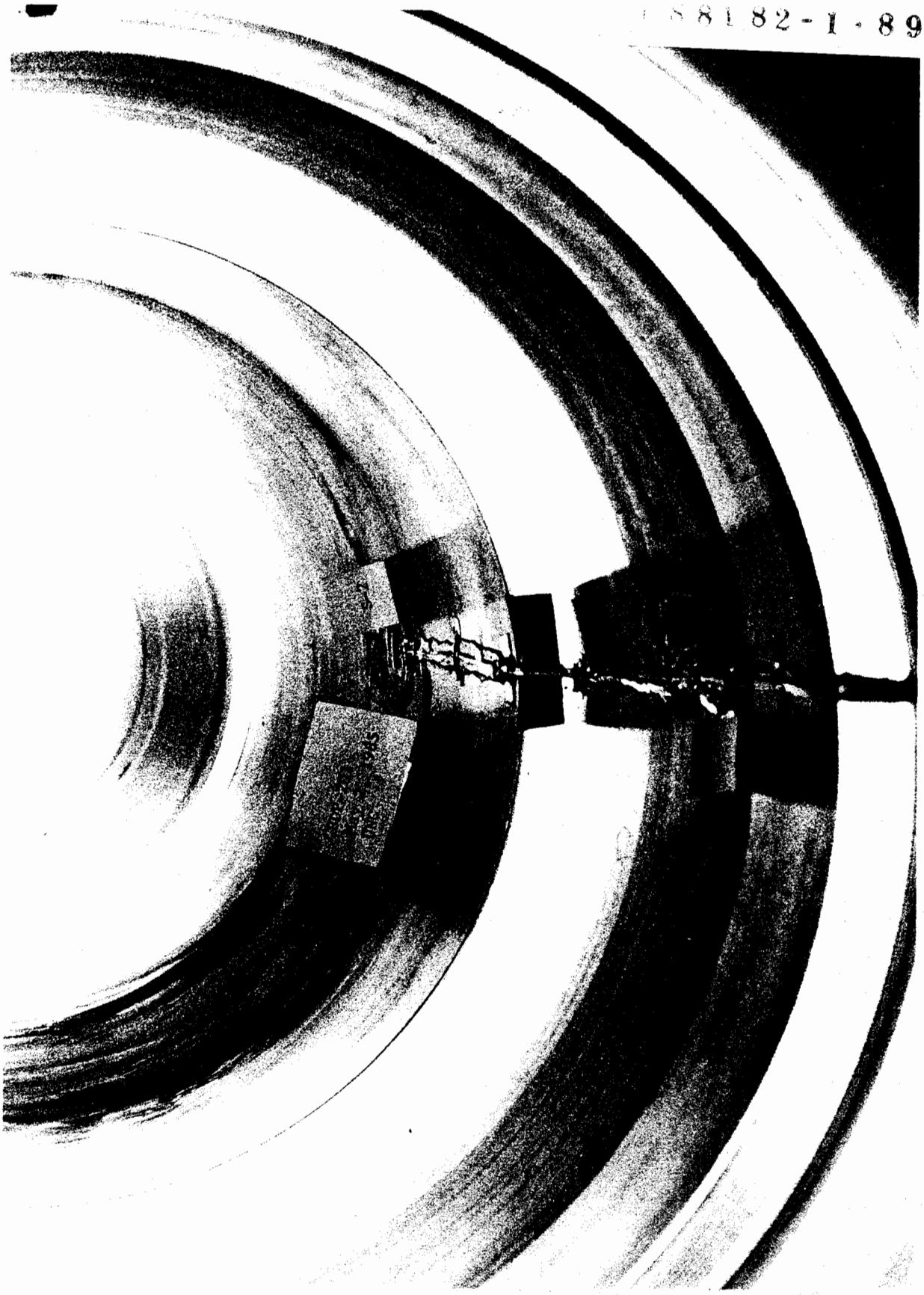

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S-5
S-3
SDP-201
May 2, 1985
UNC

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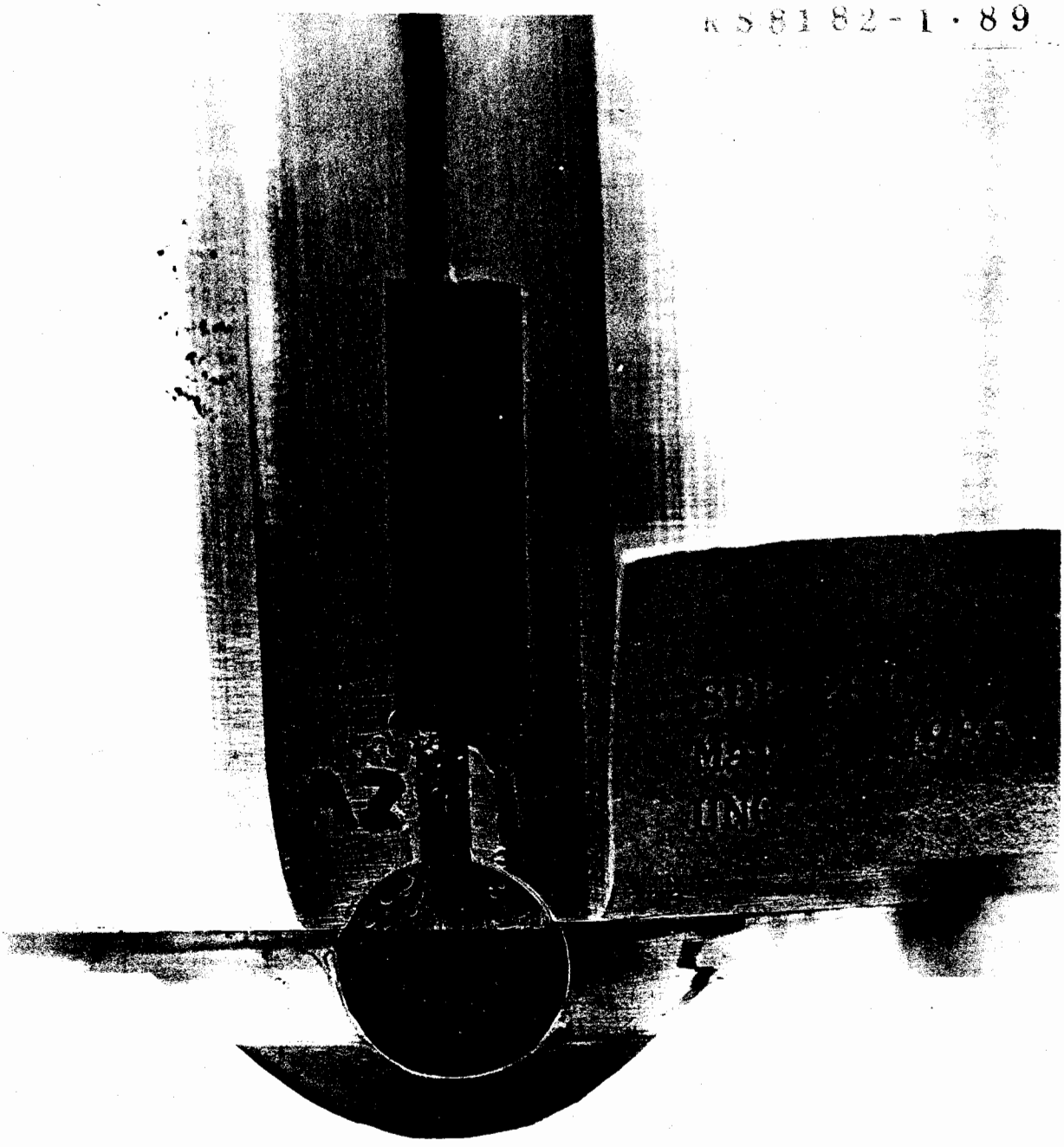
DSP-201
AX-1
4/26/85
UNC

KS 8182-1·89



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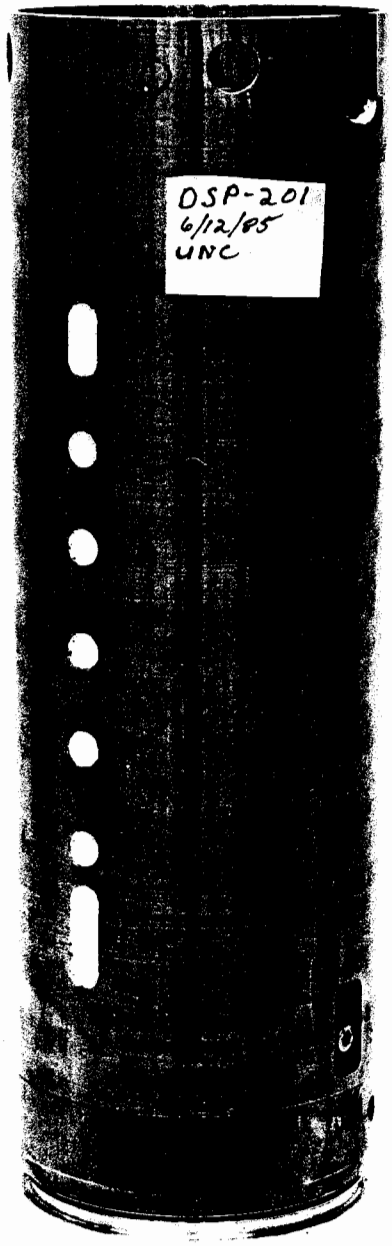

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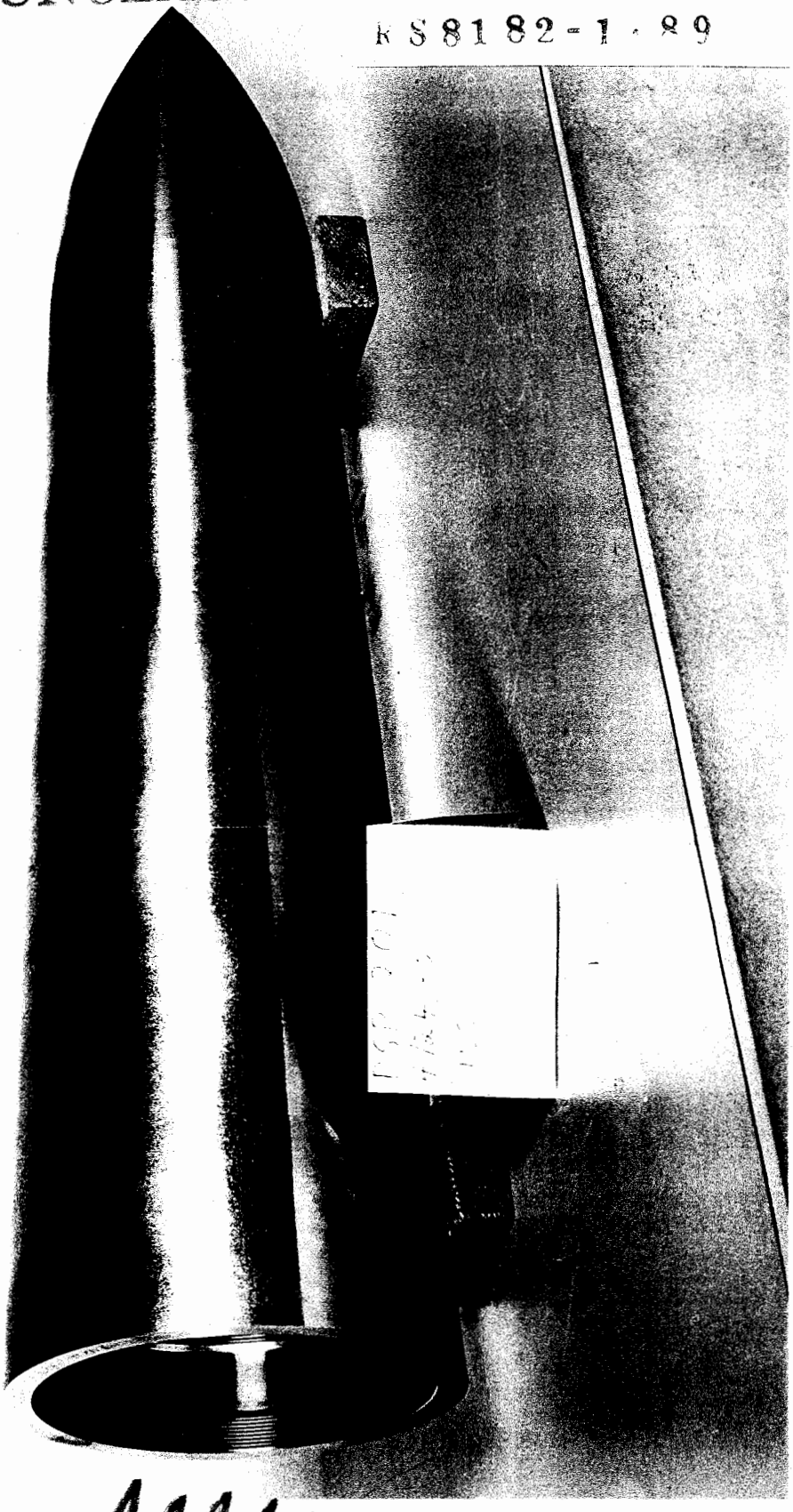

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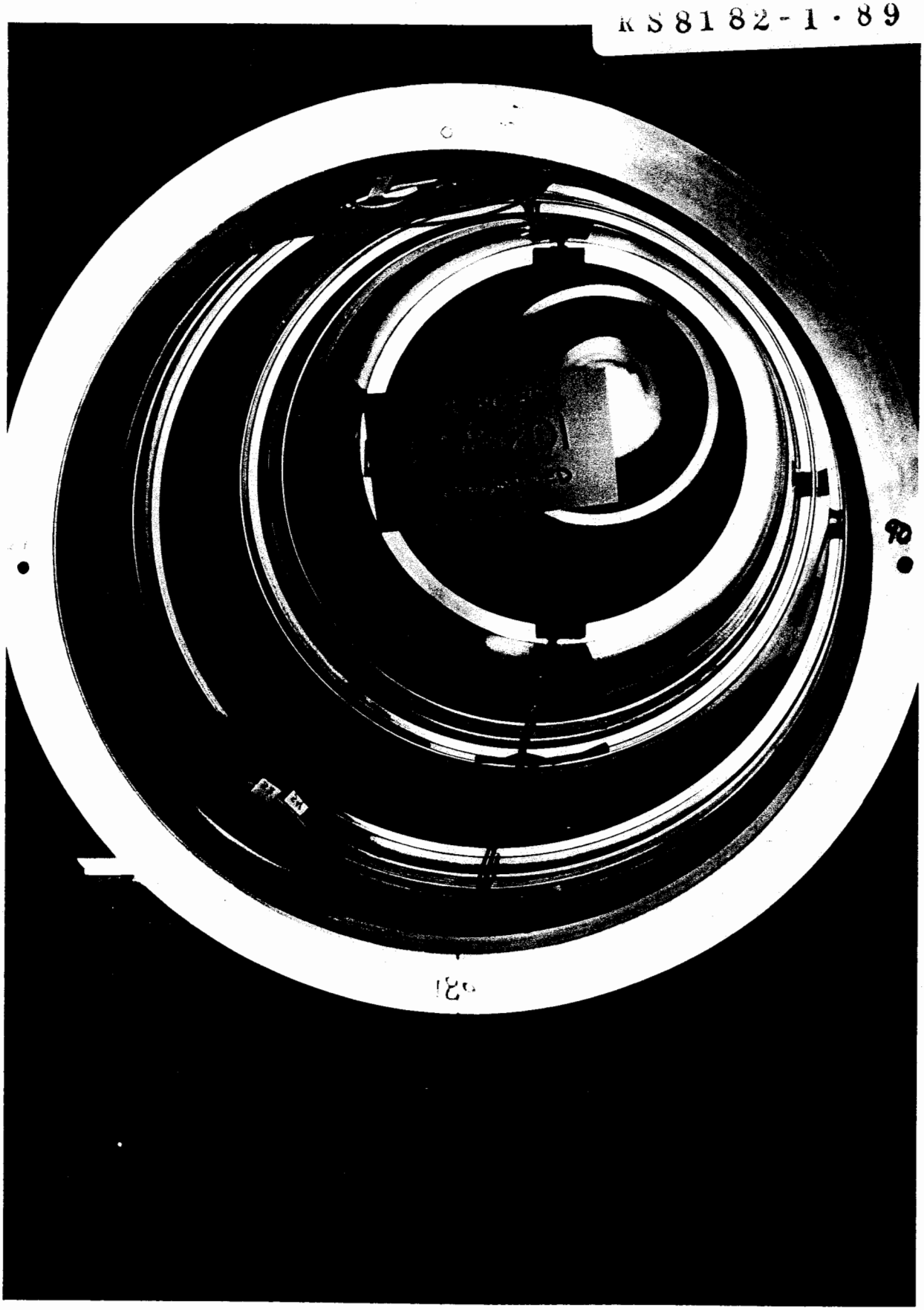

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AZ-2
4/26/85
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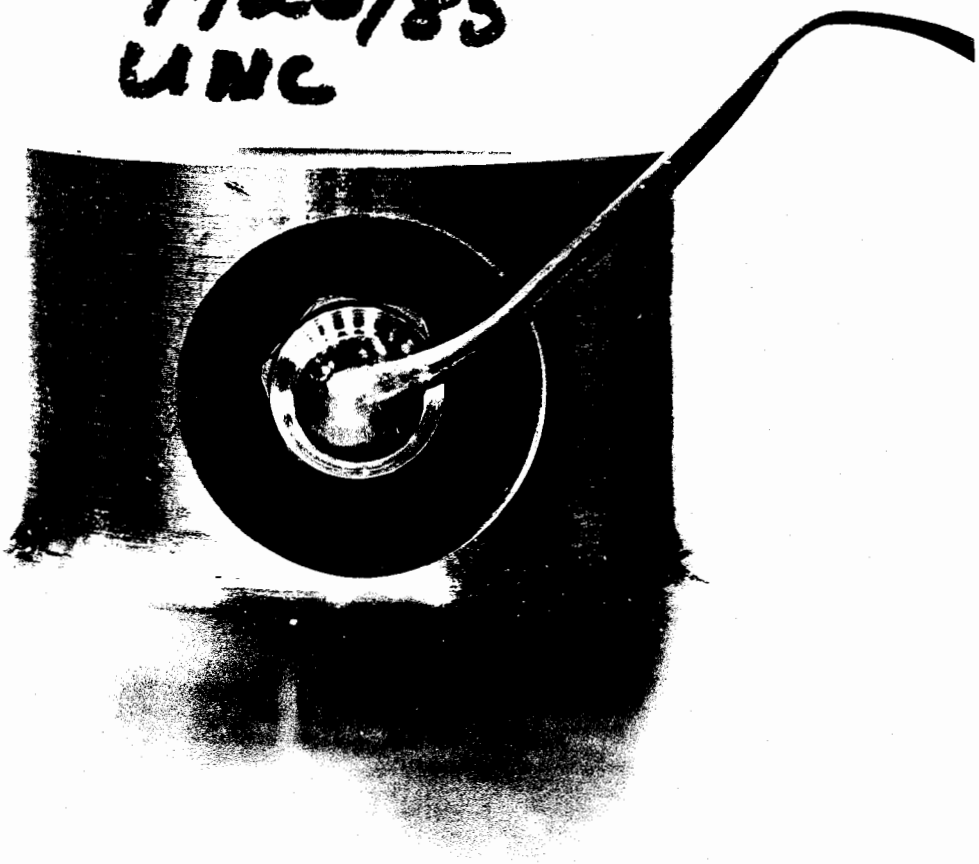

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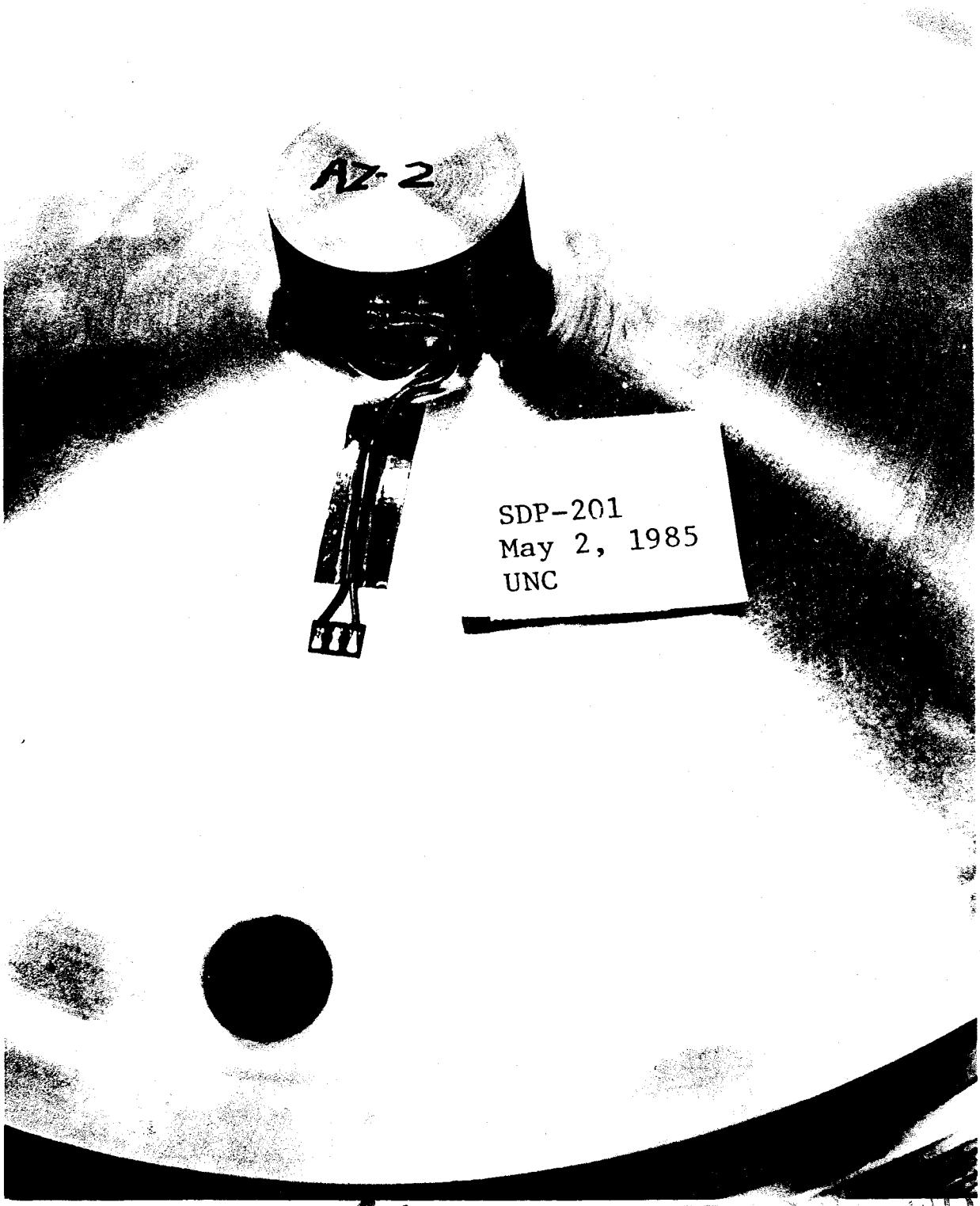

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May 2, 1985
UNC

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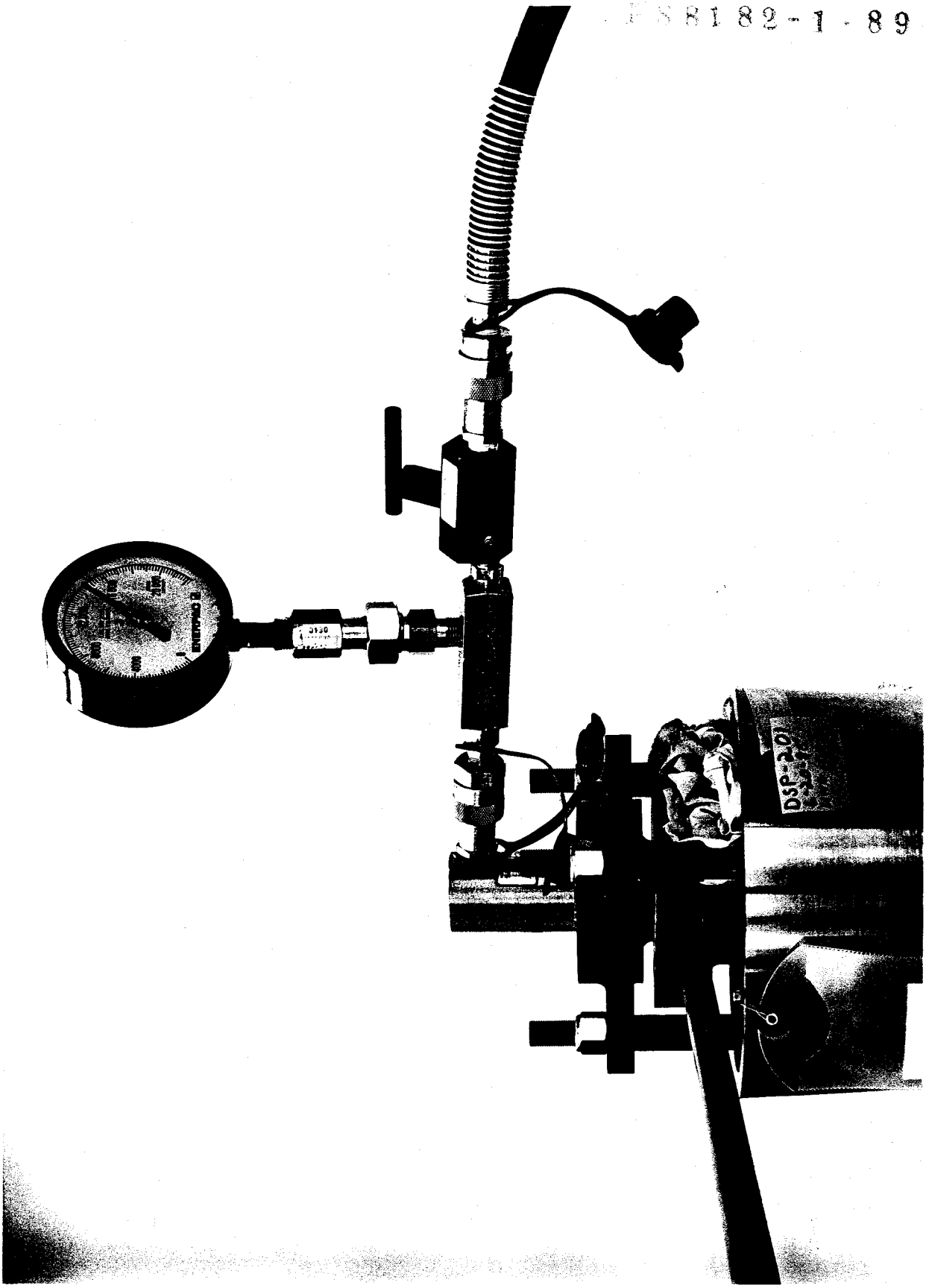
DSP-201
6-17-85
UNC

DSP-201
6-17-85
UNC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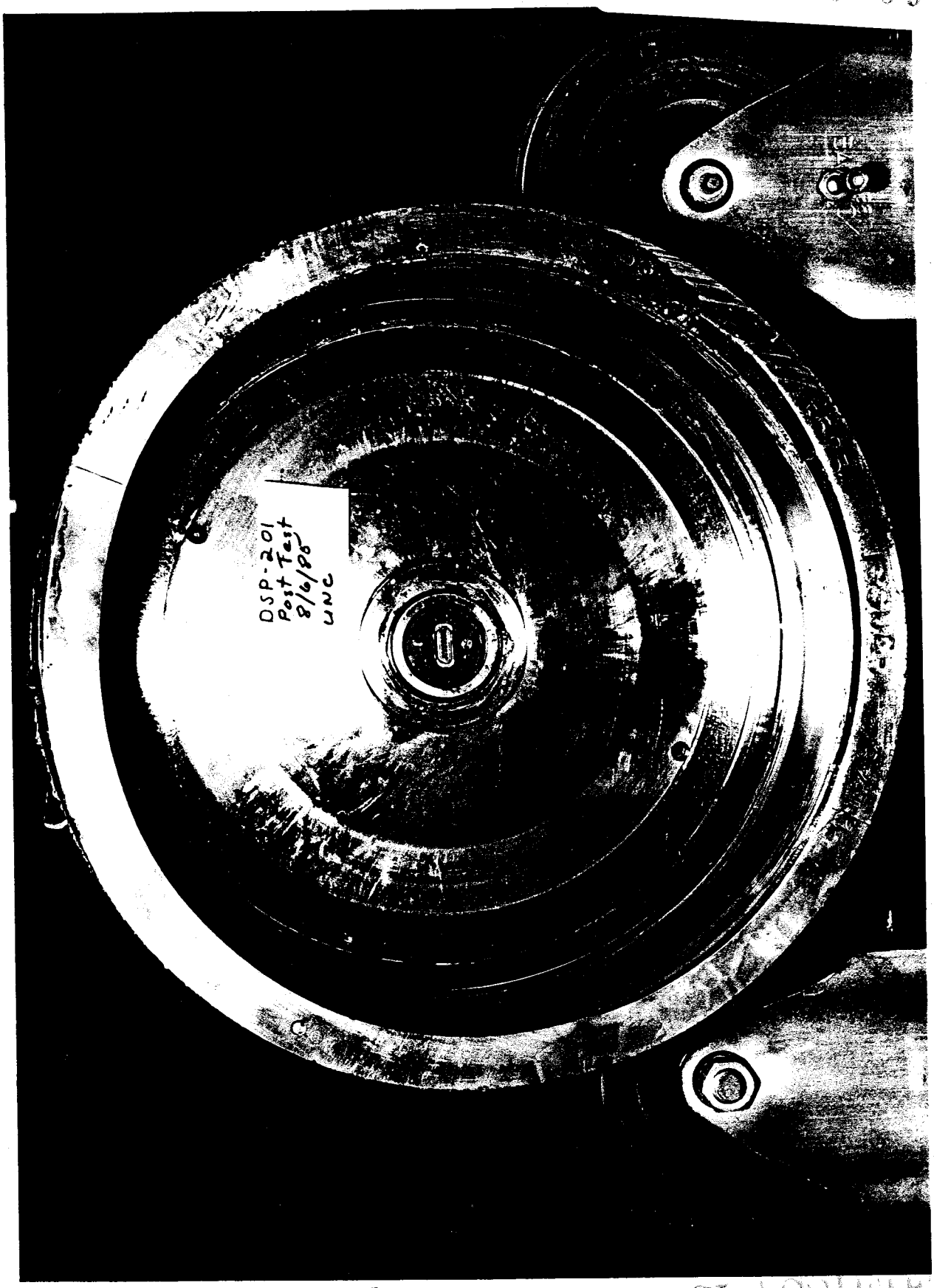
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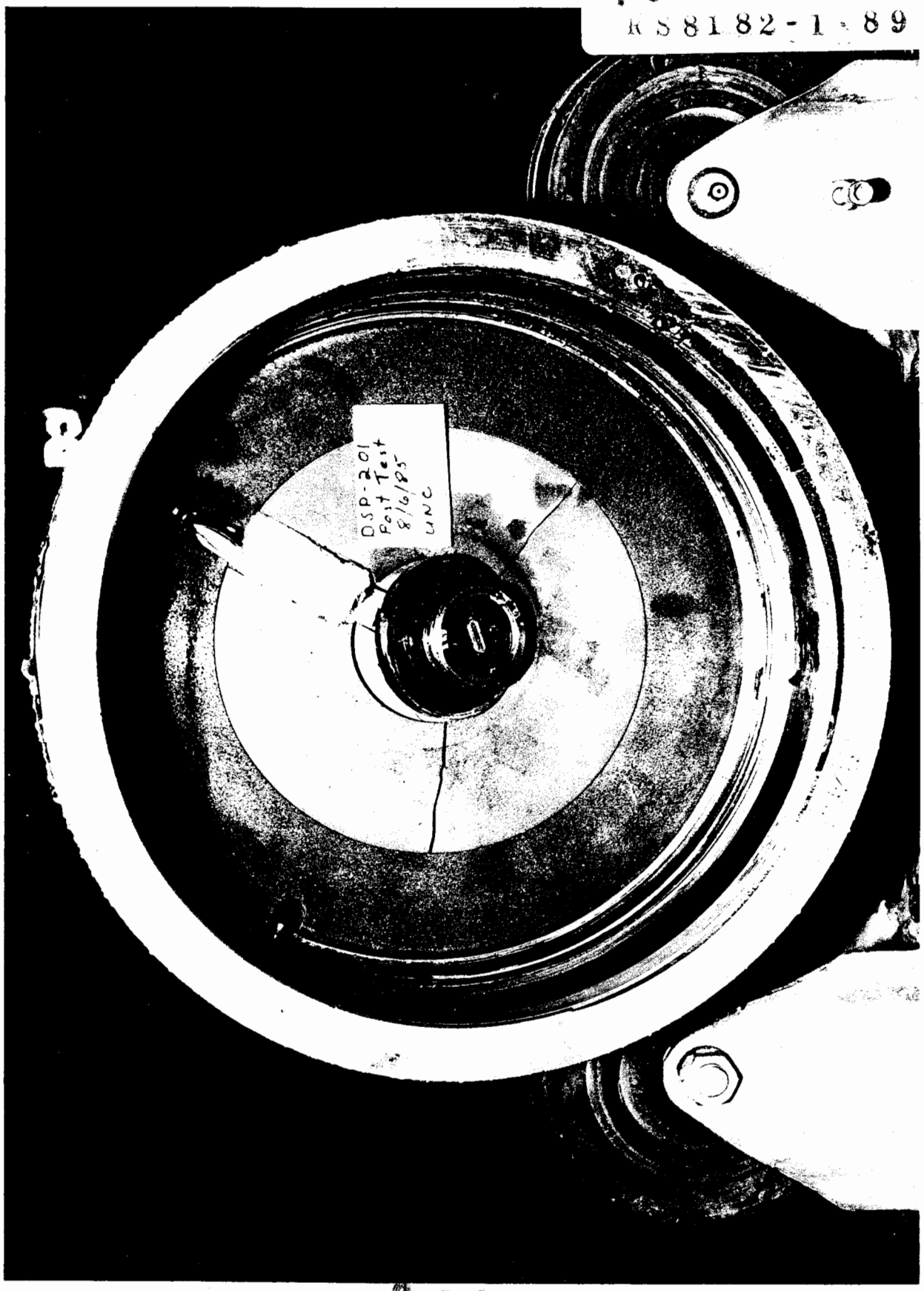

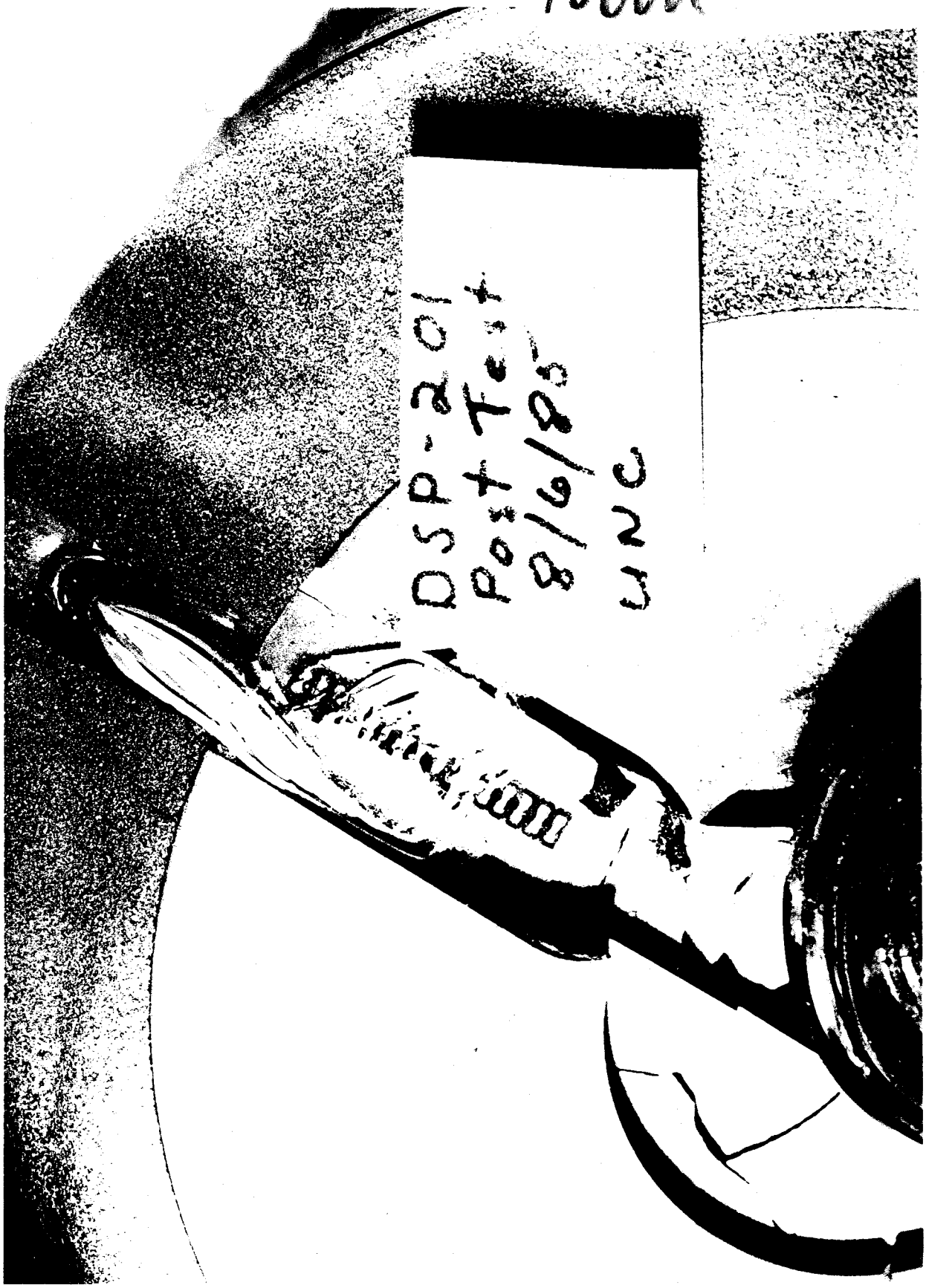
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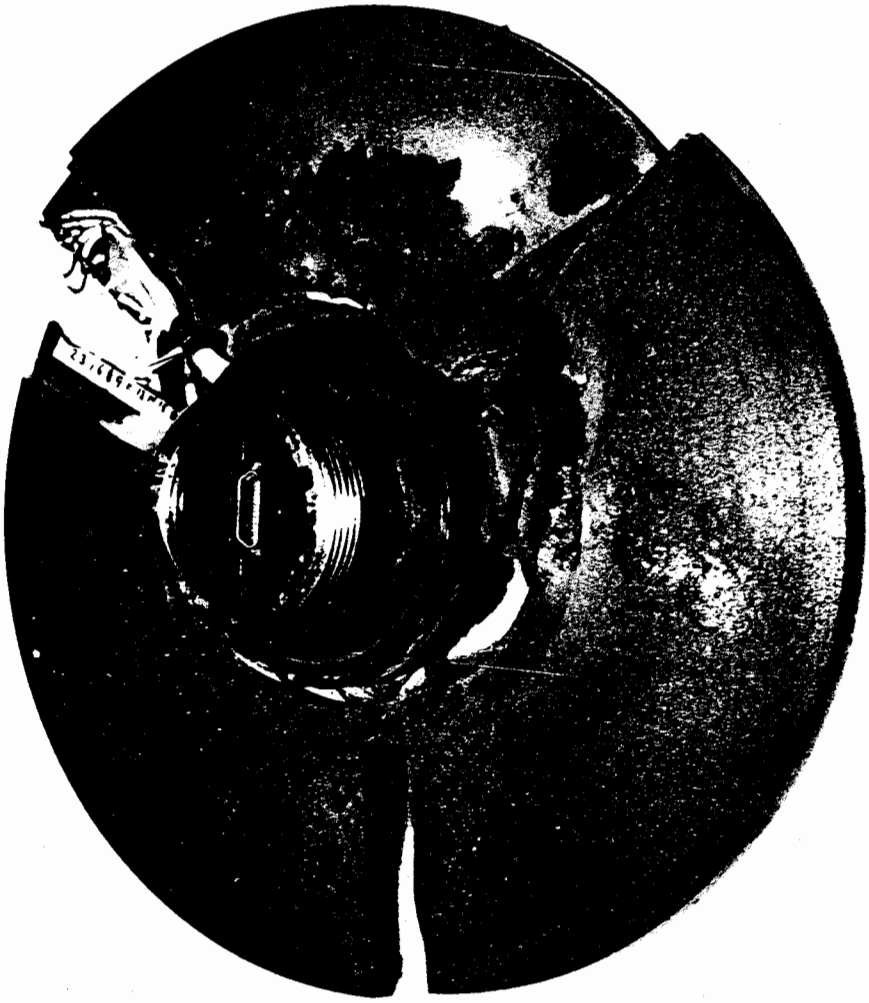

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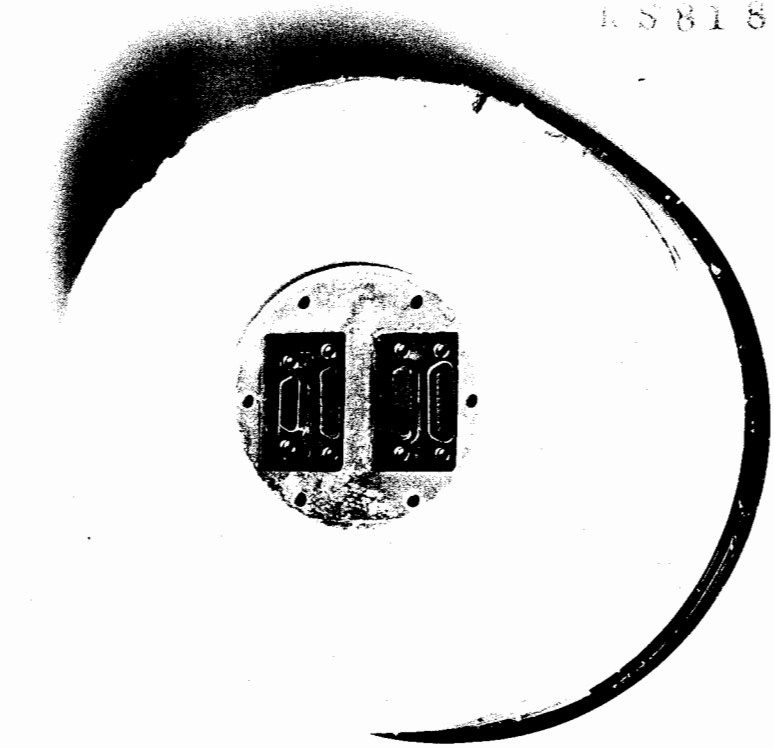

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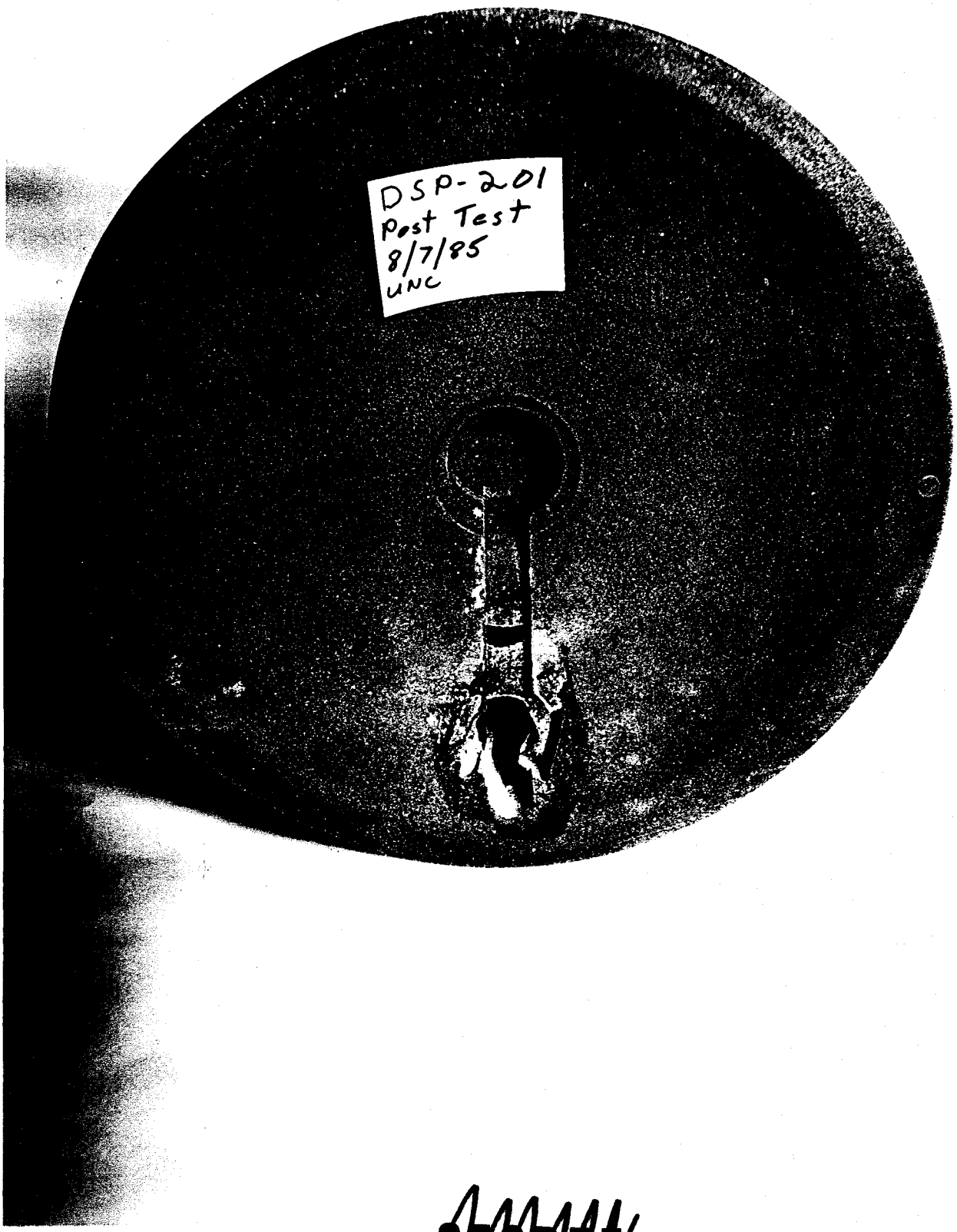
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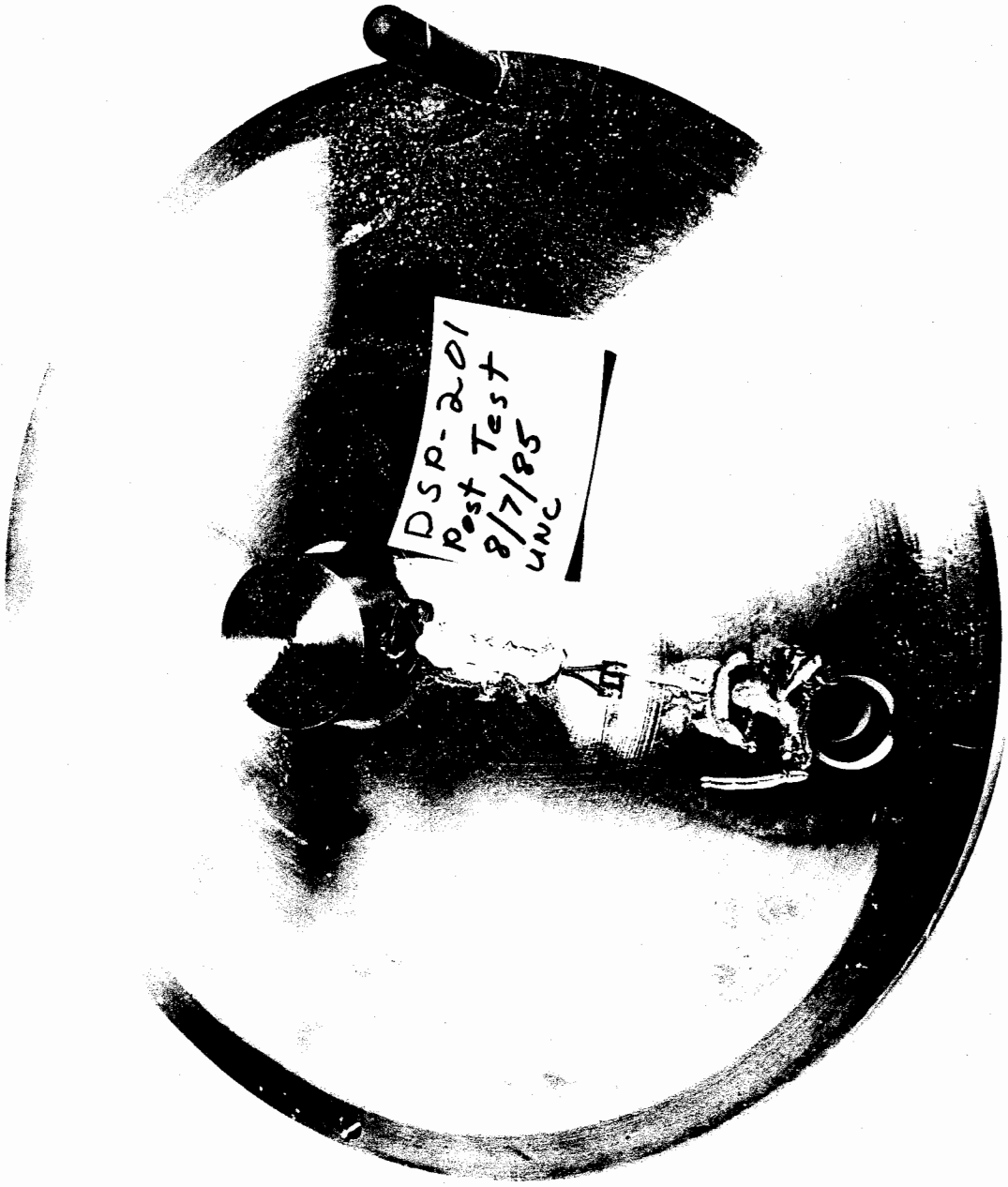

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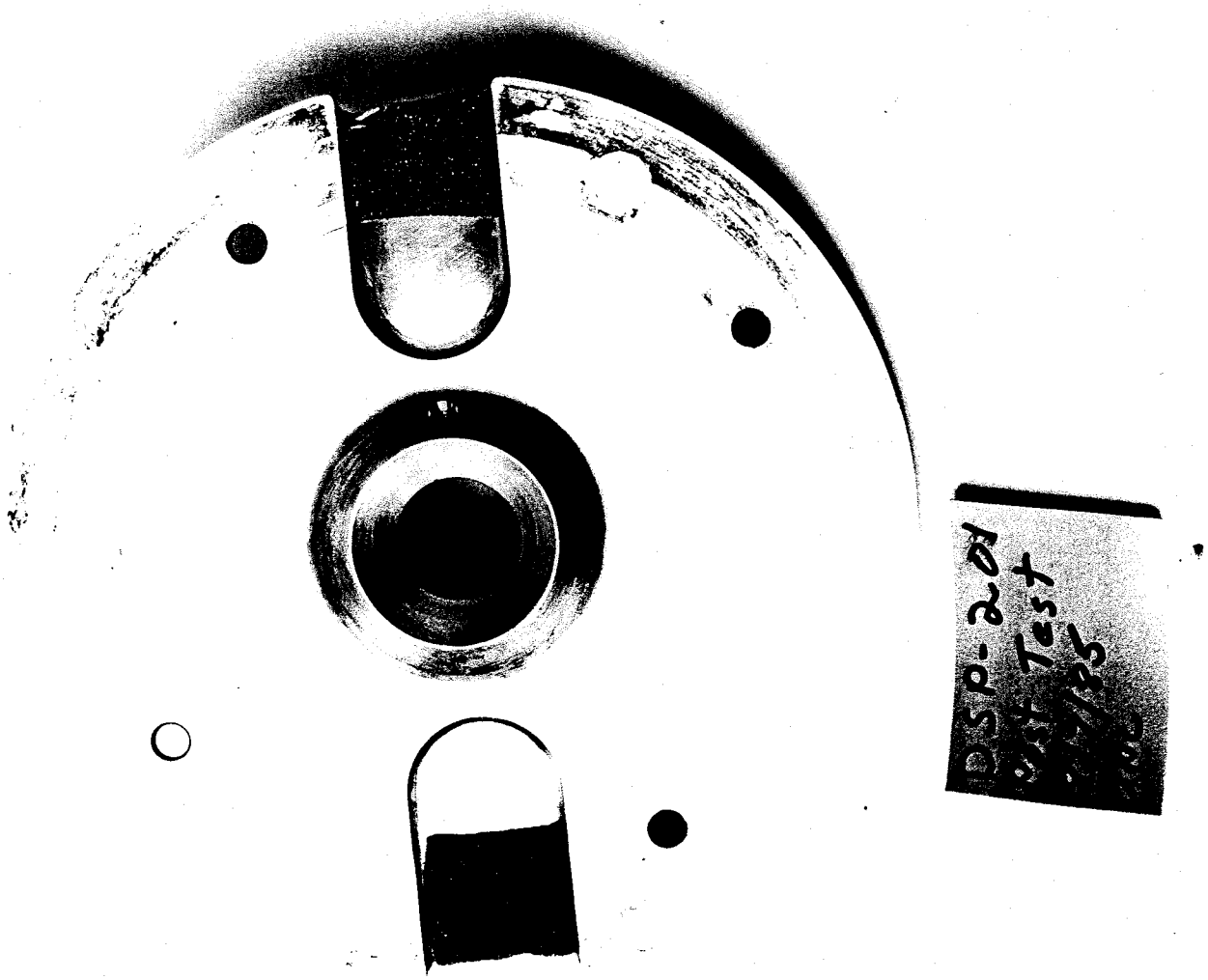

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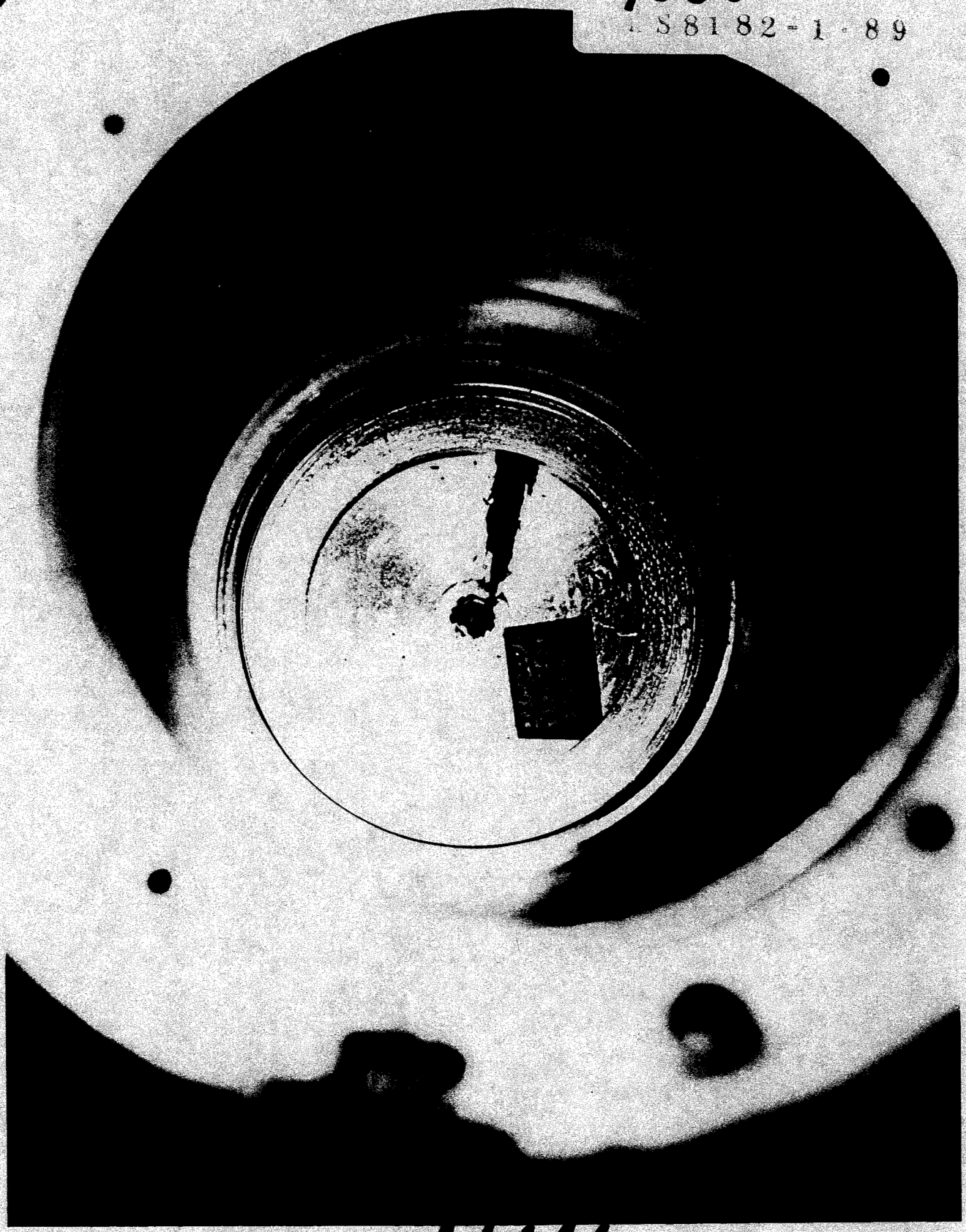

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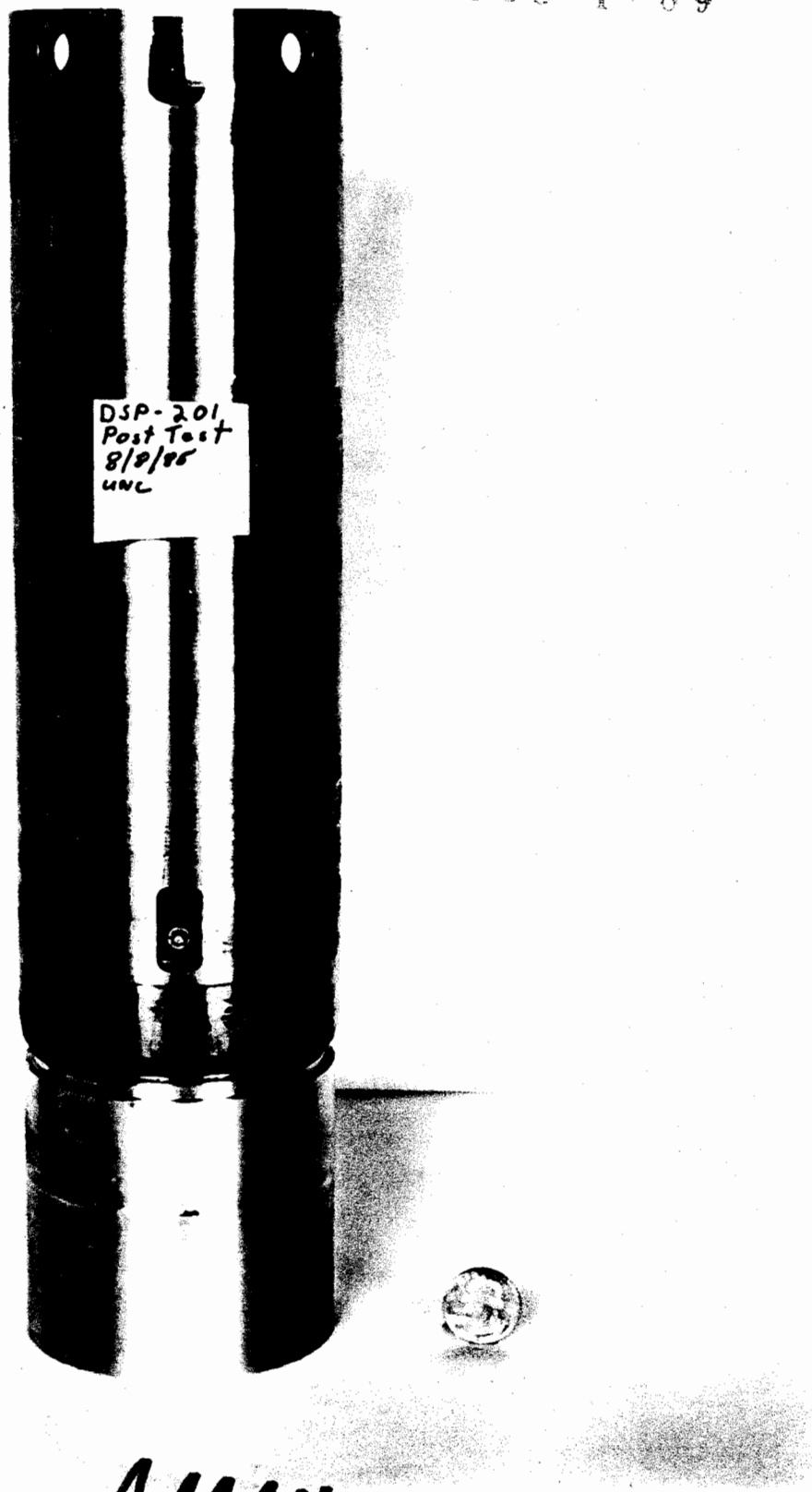

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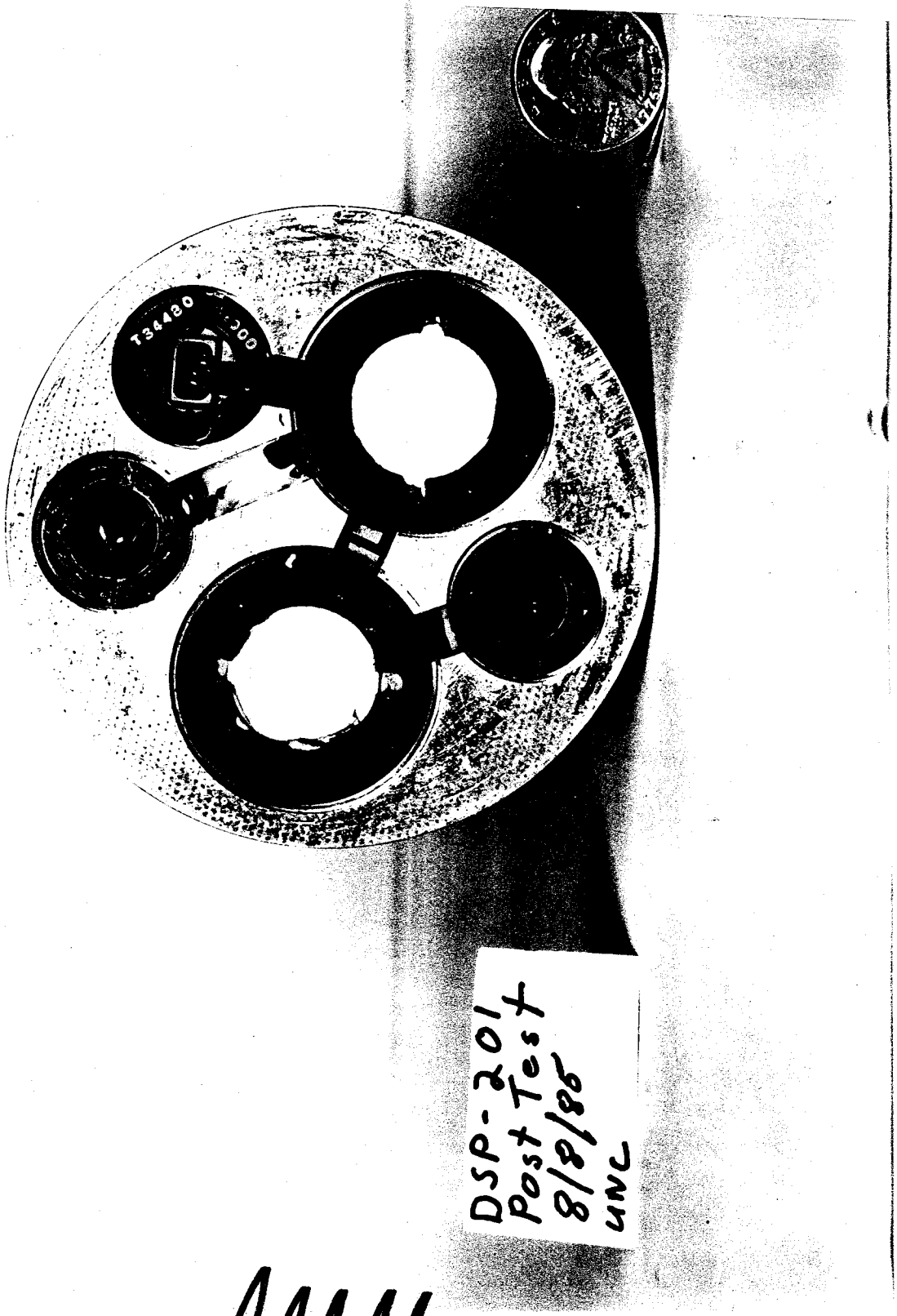

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Post Test
8/16/85
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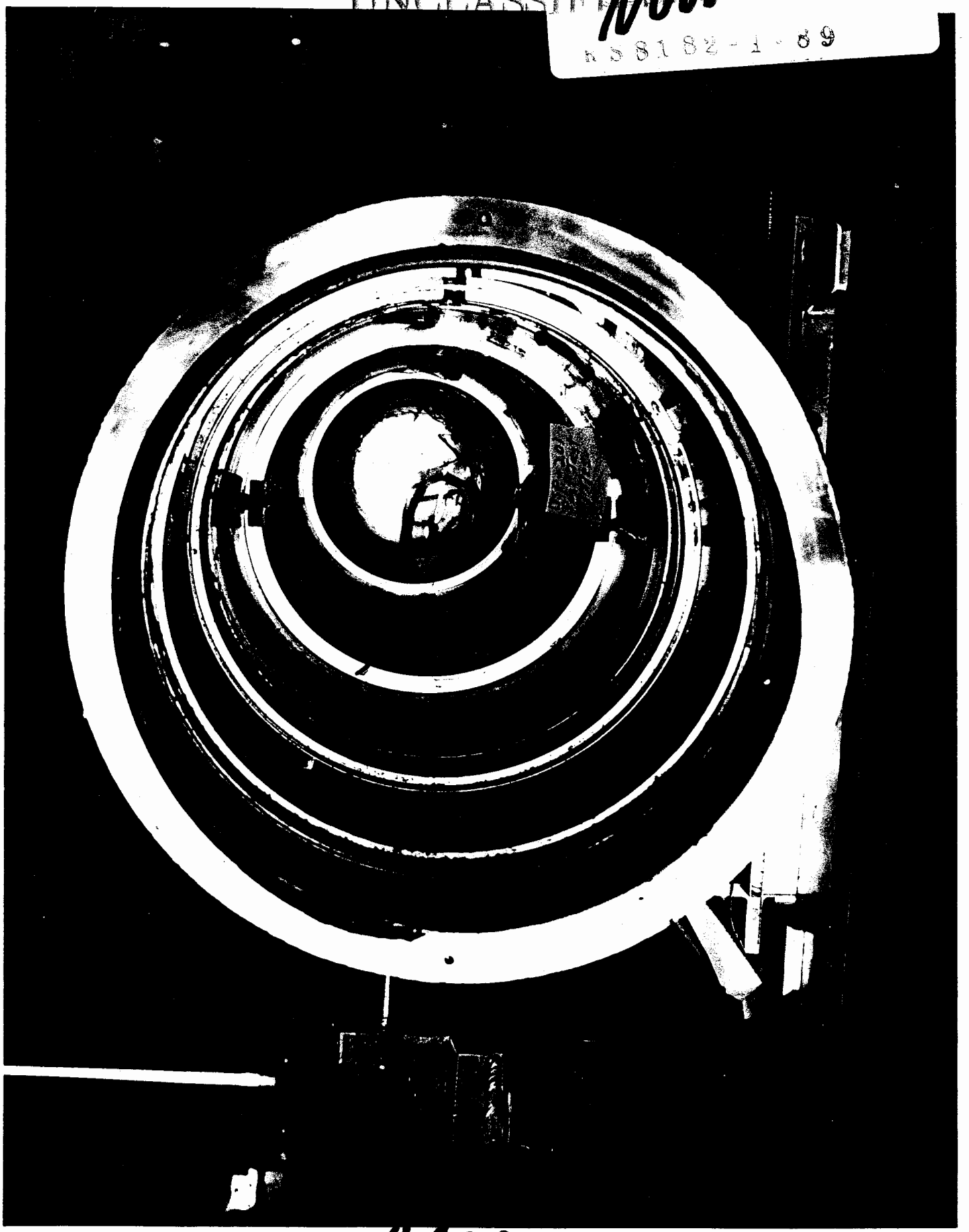

UNCLASSIFIED 0111

8 8 1 8 2 - 1 - 8 9

CLASSIFIED MATERIAL
IDENTIFICATION TAG

MATERIAL CLASSIFICATION

~~SECRET~~
~~RESTRICTED DATA~~ RY

ORG.	CMO
8182-1	820

SNLL U.S. GOVT.

C011027

SRD

OTHER:
DSP-201 Assembly
A35783 drawing

THIS TAG IS UNCLASSIFIED

SF 2730-KD(4-84)

UNCLASSIFIED

UNCLASSIFIED

Sandia National Laboratories

☐ Livermore, California 94550 ☐ Albuquerque, New Mexico 87185 XX Other TTR/NV

0112

SHIP TO:
SANDIA NATIONAL LABS
7011 East Avenue
Livermore, CA 94550
Attn: D. A. Clarin 8152

R S 1 89

Sec. Insp. Badge No.	Page
	1 of 1

Highest Material Security Class.	Document No.	Cat.	Shipment Register No.
SRD	918329	R	02875

Date Due at Destination	Date Shipped or Handcarried	Date to be Returned	Hazardous Mat'l. Packing Instr. No.
7/22/85	7/22/85	X No Return	

Site/Suplr. Code	Bldg.	Room	Org.	Employee No.	Originator of Form	Org.	Phone	Date Prepared
SNLL	913		8152		A. Green	7170a	8220	7/18/85

FROM: Site	Bldg.	Room	Org.	Requester's Name	Employee No.	Phone	Case No.	Authority for Shipment (Contract No./P.O., etc.)
SNL/TTR			8152	Jan Collins	SNLL		R724201	R.I.O.

Material Billing: ☐ Charge X No Charge
Credit Approval:
Freight Billing: ☐ Collect X Prepaid ☐ Prepaid Bill to Consignee

Sec. Class.	Quantity	Unit	Haz. Mat.	Property Tag No. And/Or MID No.	Description	Unit Value	$ Total
1 SRD	1	ea	N	----	Penetrator Unit DSP201 from Test R724201 - - - - -LAST ITEM- - - - -		

1 w BOX
ROSS

REASON FOR SHIPMENT (Explain): (See e. on Back)

GRAND TOTAL $ $

R.I.O. Location Change

*Indicate with (Y) or (N) (Yes or No) List Hazardous Material first.

Accounting Classifier	Property Mgmt. Representative
N/A	N/A

DOE Transportation Safeguards Div. Courier Required: X No ☐ Yes If yes enter category of matter code
Guard Escort Required: X No ☐ Yes

Routing	B/L No.	No. of Boxes	Weight	Total Cubic Feet/Dimensions
Ross	Manifest 09501	1 wood box	600#	50x17x17

Authorizing Signature** 7/31 Org.
Special Approval** Name Org.
Special Approval** Name Org.
Buyer Approval Name Org.

The listed material has been examined and the designations as to hazardous/nonhazardous material (HAZ. MAT.) are certified correct.
40 ☐ Hazardous XX Nonhazardous

Receipt or Return Acknowledged
41 Name
E-No. Org

Bearer's Signature
Handcarry Card Number
Packaging Engr./Svc. Clerk
Packaged by

Document No. 918329
Cat. R
Shipment Register No. 02875

AT SNLA — Use as Packing List. To accompany the package to Shipping Org. and to Traffic Org. This copy accompanies package to destination. Give to Security Inspector on return of handcarried material to SNLA to be routed to Property Management.

AT SNLL — Shipping

UNCLASSIFIED

MOVEMENT COPY

UNCLASSIFIED

[X] Livermore, California 94550 — Sandia National Laboratories [ ] Albuquerque, New Mexico 87185 — [ ] Other

0113 /207

SHIP TO: SANDIA NATIONAL LABORATORIES
TONOPAH TEST RANGE
TONOPAH, NEVADA 89049
ATTN: A.A. MCCORNELL
FOR: P. NELSON, 7173

RS 818-1-89

Sec. Insp. Badge No. 2	Page 1 of 1
Highest Material Security Class. 3: UNC	Document No.: 811912
Cat. 4: R	Shipment Register No. 5
Date Due at Destination 6: 06/28/85	Date Shipped or Handcarried 7
Date to be Returned 8: [X] No Return	Hazardous Mat'l. Packing instr. No. 9
Site/Suplr. Code 10	Bldg. / Room / Org. / Employee No.
Originator of Form 11: R. KAMP	Org.: 8161-1
Phone: 3190	Date Prepared 12: 06/24/85

FROM:

Site 13	Bldg.	Room	Org.	Requester's Name 14	Employee No.	Phone	Case No. 15	Authority for Shipment (Contract No./P.O., etc.) 16
SNLL	913	106A	8182	D. TIMMER		2778	1292090	G. CAIN

Material Billing 17: Charge [X] No Charge — Credit Approval 18 — Freight Billing 19: [ ] Collect [X] Prepaid [ ] Prepaid Bill to Consignee

Item No. 20	Sec. Class. 21	Quantity 22	Unit 23	Haz.* Mat. 24	Property Tag No. And/Or MID No. 25	Description 26	Unit Value 27	$ Total 28
1.	UNC	1	EA	N		ASSEMBLY FIXTURE, NO S/N.		
2.	UNC	3	EA	N		HANDLING GEAR.		
						---LAST ITEM---		
						EXEMPT FROM MEL ACCOUNTABILITY--		
						MATERIAL SHIPPED TO AMOTREK		
						SANDIA LOCATION.		
						BY DECLARATION OF D. TIMMER		
						THE ABOVE CONTAINS NO HAZARDOUS		
						MATERIAL AS DESIGNATED IN SLI 6550-2.		

REASON FOR SHIPMENT (Explain): (See e. on Back) — GRAND TOTAL $ $ 1,000.00

LOCATION CHANGE

*Indicate with (Y) or (N) (Yes or No)
List Hazardous Material first.

Accounting Classifier — Property Mgmt. Representative

DOE Transportation Safeguards Div. Courier Required 29: [ ] No [ ] Yes *If yes enter category of matter code* _____ — Guard Escort Required 30: [X] No [ ] Yes

Routing 31	B/L No. 32	No. of Boxes 33	Weight 34	Total Cubic Feet/Dimensions 35

Authorizing Signature** 36: MINGUEZ 8161-1 — Special Approval** 37 — Special Approval** — Buyer Approval 38

Name — Org. — Name — Org. — Name — Org.

39A — The listed material has been examined and the designations as to hazardous/nonhazardous material (HAZ. MAT.) are certified correct. 40 [ ] Hazardous [ ] Nonhazardous — Receipt or Return Acknowledged 41

Bearer's Signature — Handcarry Card Number — Packaging/Engr./Svc. Clerk — Packaged by — Name — E-No. — Org.

Document No. 811912 — Cat. — Shipment Register No.

UNCLASSIFIED

T SNLA — Use as packing list. To accompany the package to Shipping Org. and to Traffic Org. This copy accompanies package to destination Give to Security Inspector on return of handcarried material to SNLA to be routed to Property Management.
T SNLL — Shipping

MOVEMENT COPY

Sandia National Laboratories

☐ Livermore, California 94550 ☐ Albuquerque, New Mexico 871[illegible] ☐ Other /180114

UNCLASSIFIED

SHIP TO:
SANDIA NATIONAL LABORATORIES
TONOPAH TEST RANGE
TONOPAH, NEVADA 89049
ATTN: A. A. MCCONNELL
FOR: PALMER NELSON, 7173

RS 8182-1-89

Sec. Insp. Badge No.	Page
	1 of 1

Highest Material Security Class.	Document No.	Cat.	Shipment Register No.
SRD	811590	R	

Date Due at Destination	Date Shipped or Handcarried	Date to be Returned	Hazardous Mat'l. Packing instr. No.
06/24/85		☐ No Return	

Site/Suplr. Code	Bldg.	Room	Org.	Employee No.	Originator of Form	Org.	Phone	Date Prepared
					KAMP	8161-1	3196	06/06/85

FROM: Site	Bldg.	Room	Org.	Requester's Name	Employee No.	Phone	Case No.	Authority for Shipment (Contract No./P.O., etc.)
SNLL	913	106A	8152	D. TIMMER		2778	1292096	G. CAIN

Material Billing: ☐ Charge ☑ No Charge
Credit Approval:
Freight Billing: ☐ Collect ☐ Prepaid ☐ Prepaid Bill to Consignee

Sec. Class.	Quantity	Unit	Haz.* Mat.	Property Tag No. And/Or MID No.	Description	Unit Value	$ Total
SRD	1	EA	N	C011027	PENETRATOR UNIT DSP201, A33679. ---LAST ITEM---		

EXEMPT FROM MEL ACCOUNTABILITY--
MATERIAL SHIPPED TO ANOTHER
SANDIA LOCATION.

BY DECLARATION OF D. TIMMER
THE ABOVE CONTAINS NO HAZARDOUS
MATERIAL AS DESIGNATED IN SLI 6950-2.

SHIP VIA ROSS TO MELT SCHEDULE.

(John Tootle Call Ike
When material is Ready)

REASON FOR SHIPMENT (Explain): (See e. on Back) GRAND TOTAL $ $ 10,000.00

LOCATION [illegible]GE

*Indicate with (Y) or (N) (Yes or No)
List Hazardous Material first.

Accounting Classifier	Property Mgmt. Representative

DOE Transportation Safeguards Div. Courier Required ☐ No ☐ Yes If yes enter category of matter code
Guard Escort Required ☐ No ☐ Yes

Routing	B/L No.	No. of Boxes	Weight	Total Cubic Feet/Dimensions

Authorizing Signature** [signature] DOMINGUEZ 816[illegible]
Special Approval** Name Org.
Special Approval** Name Org.
Buyer Approval Name Org.

The listed material has been examined and the designations as to hazardous/nonhazardous material (HAZ. MAT.) are certified correct.
☐ Hazardous ☐ Nonhazardous

Receipt or Return Acknowledged
Name
E-No. Org.

Bearer's Signature
Handcarry Card Number
Packaging/Engr./Svc. Clerk
Packaged by

Document No. 811590
Cat.
Shipment Register No.

AT SNLA — Use as packing list. To accompany the package to Shipping Org. and to Traffic Org. This copy accompanies package to destination Give to Security Inspector on return of handcarried material to SNLA to be routed to Property Management.
AT SNLL — Shipping

MOVEMENT COPY

UNCLASSIFIED

SHIPPER

Sandia National Laboratories

☐ Livermore, California 94550 ☐ Albuquerque, New Mexico 87185 ☐ Other /18/

SHIP TO:
SANDIA NATIONAL LABORATORIES
TONOPAH TEST RANGE
TONOPAH, NEVADA 89049
ATTN: A. A. MCCONNELL
FOR: PALMER NELSON, 7173

Sec. Insp. Badge No. 2	Page 1 of 1

Highest Material Security Class. 3	Document No.	Cat. 4	Shipment Register No. 5
SRD	811590	H	

Date Due at Destination 6	Date Shipped or Handcarried 7	Date to be Returned 8	Hazardous Mat'l. Packing instr. No. 9
06/24/85		☒ No Return	

Dir. Code	Bldg.	Room	Org.	Employee No.	Originator of Form 11	Org.	Phone	Date Prepared 12
					KAMP	8161-1	3196	06/06/85

FROM: Site	Bldg.	Room	Org.	Requester's Name 14	Employee No.	Phone	Case No. 15	Authority for Shipment (Contract No./P.O., etc.) 16
SNLL	913	106A	8182	D. TIMMER		2778	1292090	G. CAIN

Material Billing ☐ Charge ☒ No Charge | Credit Approval 18 | Freight Billing 19 ☐ Collect ☒ Prepaid ☐ Prepaid Bill to Consignee

Item No.	Sec. Class. 21	Quantity 22	Unit 23	Haz. Mat. 24	Property Tag No. And/Or MID No. 25	Description 26	Unit Value 27	$ Total 28
1	SRD	1	EA	N	C011027	PENETRATOR UNIT DSP201, A33679. ---LAST ITEM---		

EXEMPT FROM MEL ACCOUNTABILITY--
MATERIAL SHIPPED TO ANOTHER
SANDIA LOCATION.

BY DECLARATION OF D. TIMMER
THE ABOVE CONTAINS NO HAZARDOUS
MATERIAL AS DESIGNATED IN SLI 6950-2.

SHIP VIA ROSS TO MEET SCHEDULE.

(John Tootle Call Ike
When material is Ready)

REASON FOR SHIPMENT (Explain): (See e. on Back) GRAND TOTAL $ $ 10,000.00

LOCATION CHANGE

UNCLASSIFIED

Indicate with (Y) or (N) (Yes or No) List Hazardous Material first.

Accounting Classifier | Property Mgmt. Representative

Document No. 811590

Transportation Safeguards Div. Courier Required ☐ No ☐ Yes If yes enter category of matter code | Guard Escort Required 30 ☐ No ☐ Yes

B/L No. | No. of Boxes | Weight | Total Cubic Feet/Dimensions

Special Approval | Special Approval | Buyer Approval

Name | Org. | Name | Org. | Name | Org.

The listed material has been examined and the designation ... Receipt or Return Acknowledged

☐ Livermore, California 94550 ☐ Albuquerque, New Mexico 87185 ☐ Other /18/

Sandia National Laboratories

UNCLASSIFIED

HIP TO:
SANDIA NATIONAL LABORATORIES
T PAH TEST RANGE
T. PAH, NEVADA 89049
ATTN: A. A. MCCONNELL
FOR: PALMER NELSON, 7173

Sec. Insp. Badge No. 2	Page 1 of 1
Highest Material Security Class. 3: UNC	Document No. 811591
Cat. 4	Shipment Register No. 5
Date Due at Destination 6: 06/10/85	Date Shipped or Handcarried 7
Date to be Returned 8: ☒ No Return	Hazardous Mat'l. Packing instr. No. 9
Originator of Form 11: KAMP	Org.: 3161-1
Phone: 3196	Date Prepared 12: 06/06/85

e/Suplr. Code	Bldg.	Room	Org.	Employee No.

ROM: Site	Bldg.	Room	Org.	Requester's Name 14	Employee No.	Phone	Case No. 15	Authority for Shipment (Contract No./P.O., etc.) 16
SNLL	913	106A	8182	D. TIMMER		2778	1292010	G. CAIN

aterial Billing: arge ☒ No Charge — Credit Approval 18 — Freight Billing 19: ☐ Collect ☐ Prepaid ☐ Prepaid Bill to Consignee

m.	ec. Class. 21	Quantity 22	Unit 23	Haz.* Mat. 24	Property Tag No. And/Or MID No. 25	Description 26	Unit Value 27	$ Total 28
1	UNC	1	EA	N		DAVIS GUN WAR SIMULATOR A36085 ---LAST ITEM---		

EXEMPT FROM MEL ACCOUNTABILITY--
MATERIAL SHIPPED TO ANOTHER
SANDIA LOCATION.

BY DECLARATION OF D. TIMMER
THE ABOVE CONTAINS NO HAZARDOUS
MATERIAL AS DESIGNATED IN SLI 6950-2.

SHIP VIA ROSS TO MEET SCHEDULE.

JUN 7 10 10 PM '85
SHIPPING
RECEIVED

picked up 10:26 6/7/85

EASON FOR SHIPMENT (Explain): (See e. on Back) GRAND TOTAL $ $ 1,615.0

LOCATION CHANGE

*Indicate with (Y) or (N) (Yes or No)
List Hazardous Material first.

Accounting Classifier	Property Mgmt. Representative

Document No. 811591

DE Transportation Safeguards Div. Courier Required ☒ No ☐ Yes If yes enter category of matter code _____ Guard Escort Required 30 ☒ No ☐ Yes

outing	B/L No. 32	No. of Boxes 33	Weight 34	Total Cubic Feet/Dimensions 35

uthorizing Signature**	Special Approval** 37	Special Approval**	Buyer Approval 38
MINGUEZ 8161-1	Name Org.	Name Org.	Name Org.

Cat. Shipment Register No.

A

The listed material has been examined and the designations as to hazardous/nonhazardous material (HAZ. MAT.) are certified correct.
40 ☐ Hazardous ☐ Nonhazardous

Receipt or Return Acknowledged 41

Name

B Bearer's Signature

Handcarry Card Number — Packaging/Engr./Svc. Clerk — Packaged by — E-No. — Org.

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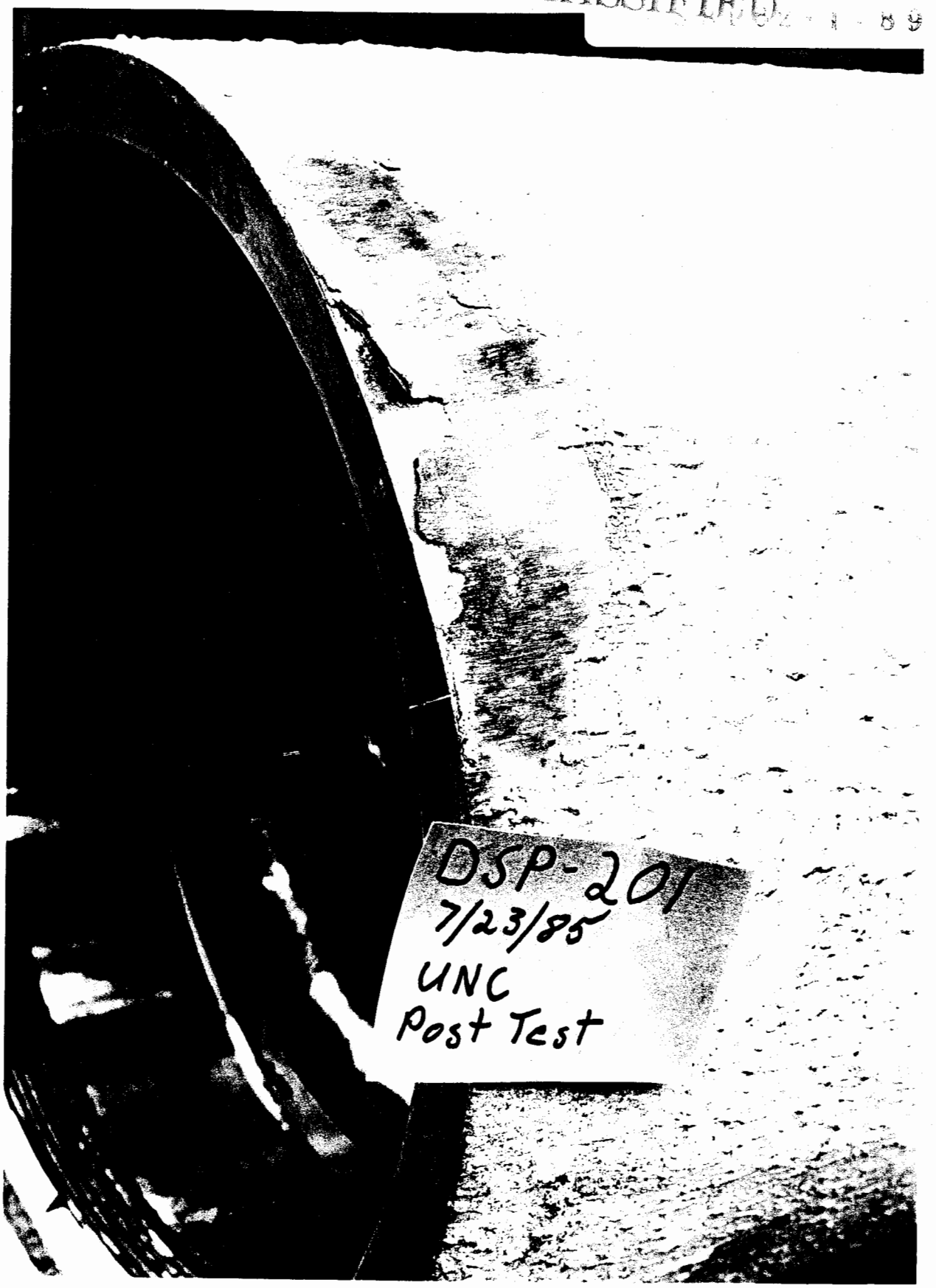
SNLA — Use as packing list. To accompany the package to Shipping Org. and to Traffic Org. This copy accompanies package to destination Give to Security Inspector on return of handcarried material to SNLA to be routed to Property Management.
SNLL — Shipping

MOVEMENT COPY

SECRET
UNCLASSIFIED



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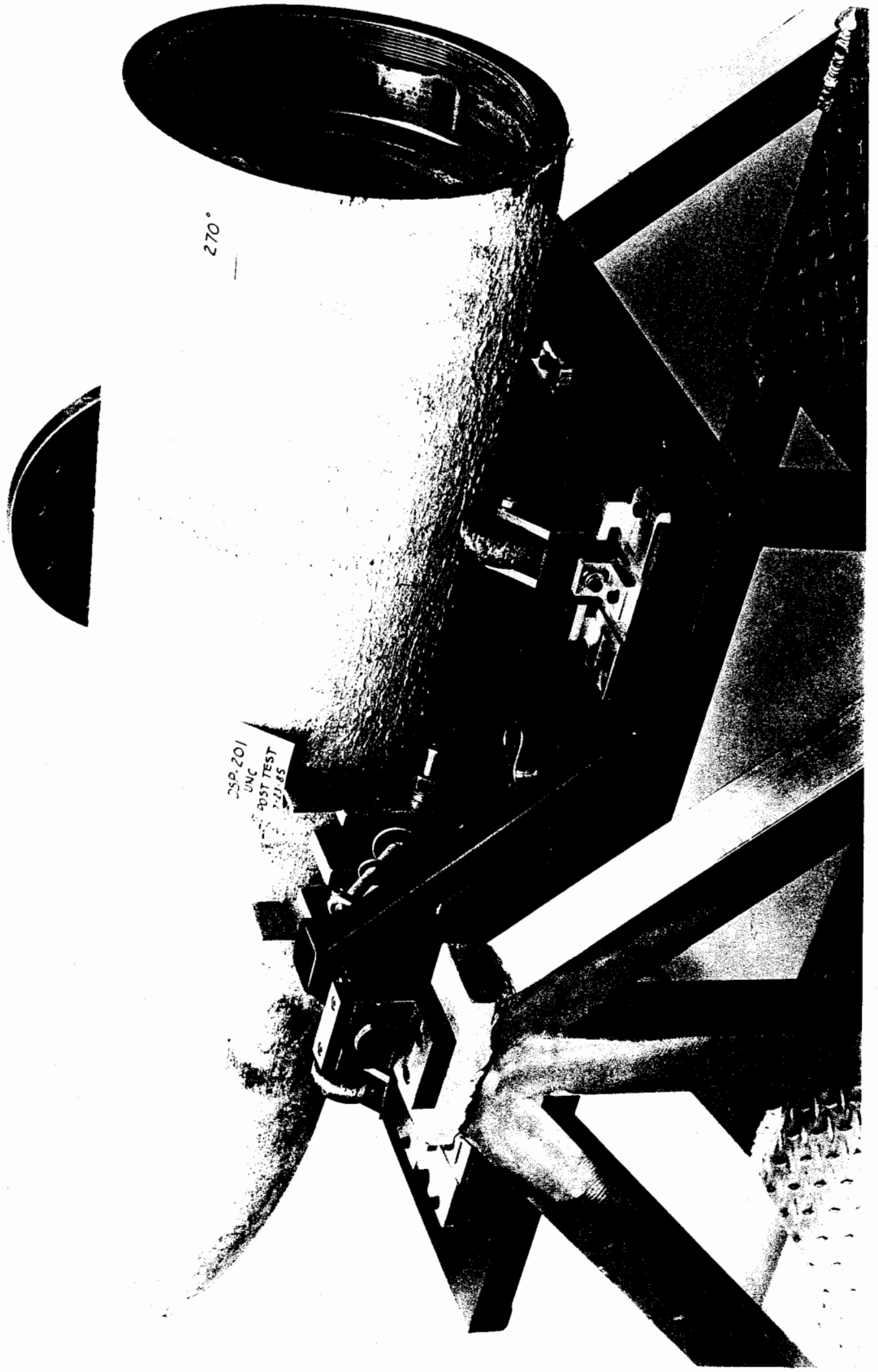
SECRET
UNCLASSIFIED



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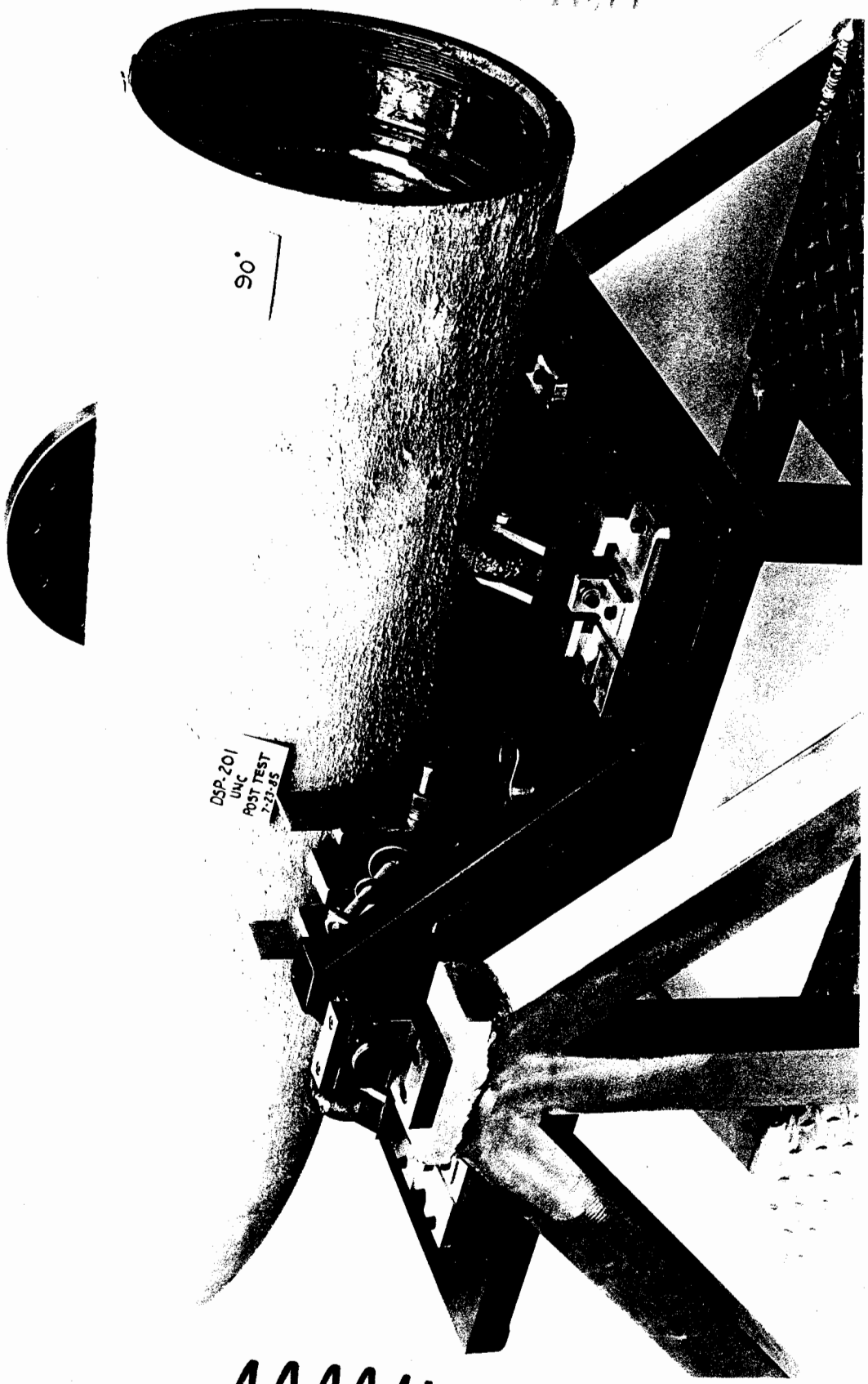

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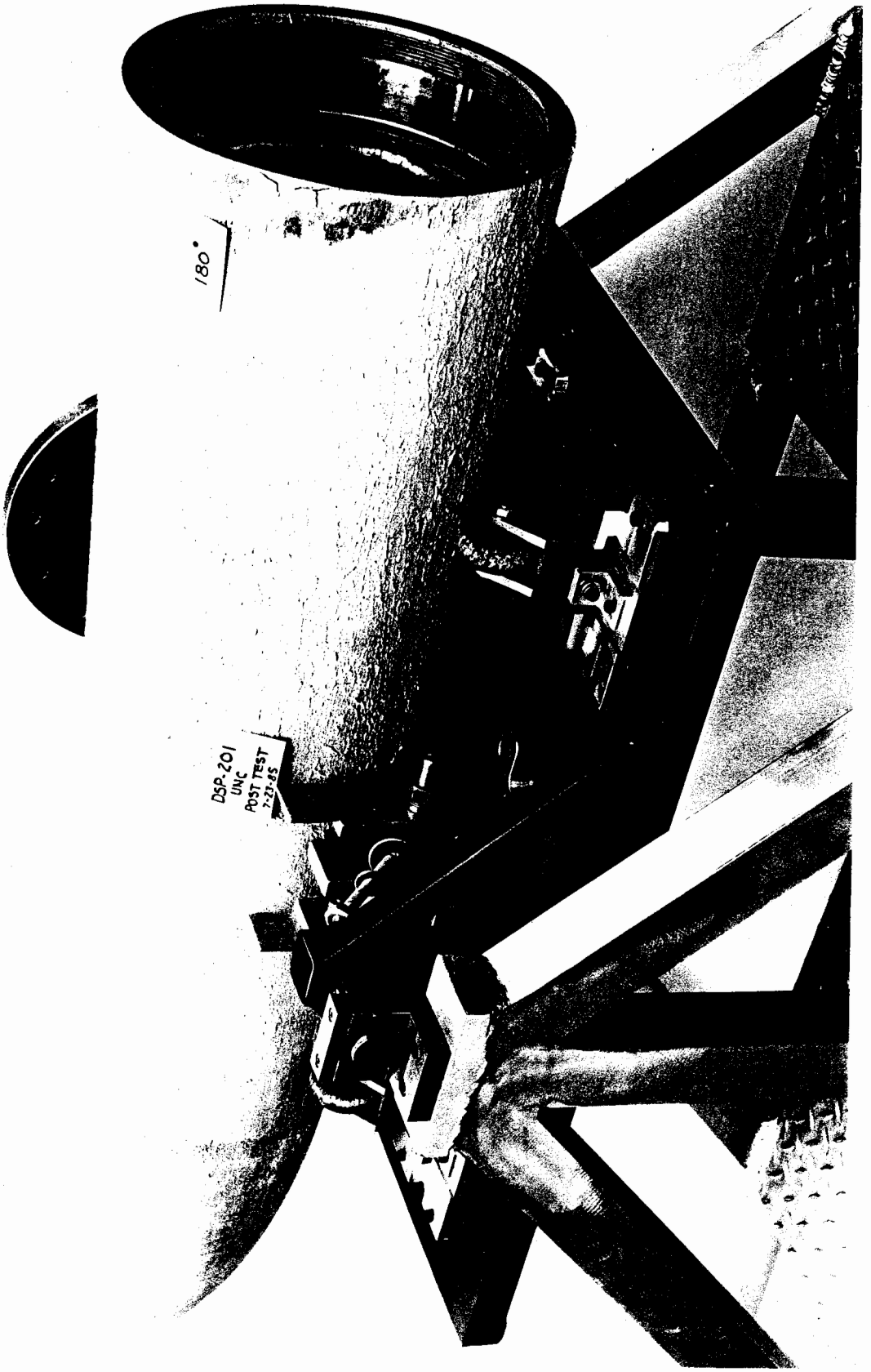
180°
DSP-201
UNC
POST TEST
7-23-85

0°
DSP-201
UNC
POST TEST
7-23-85

DSP-201
UNC
POST TEST
7-23-85

UNCLASSIFIED

UNCLASSIFIED

DSP-201
UNC
POST TEST
7-23-85

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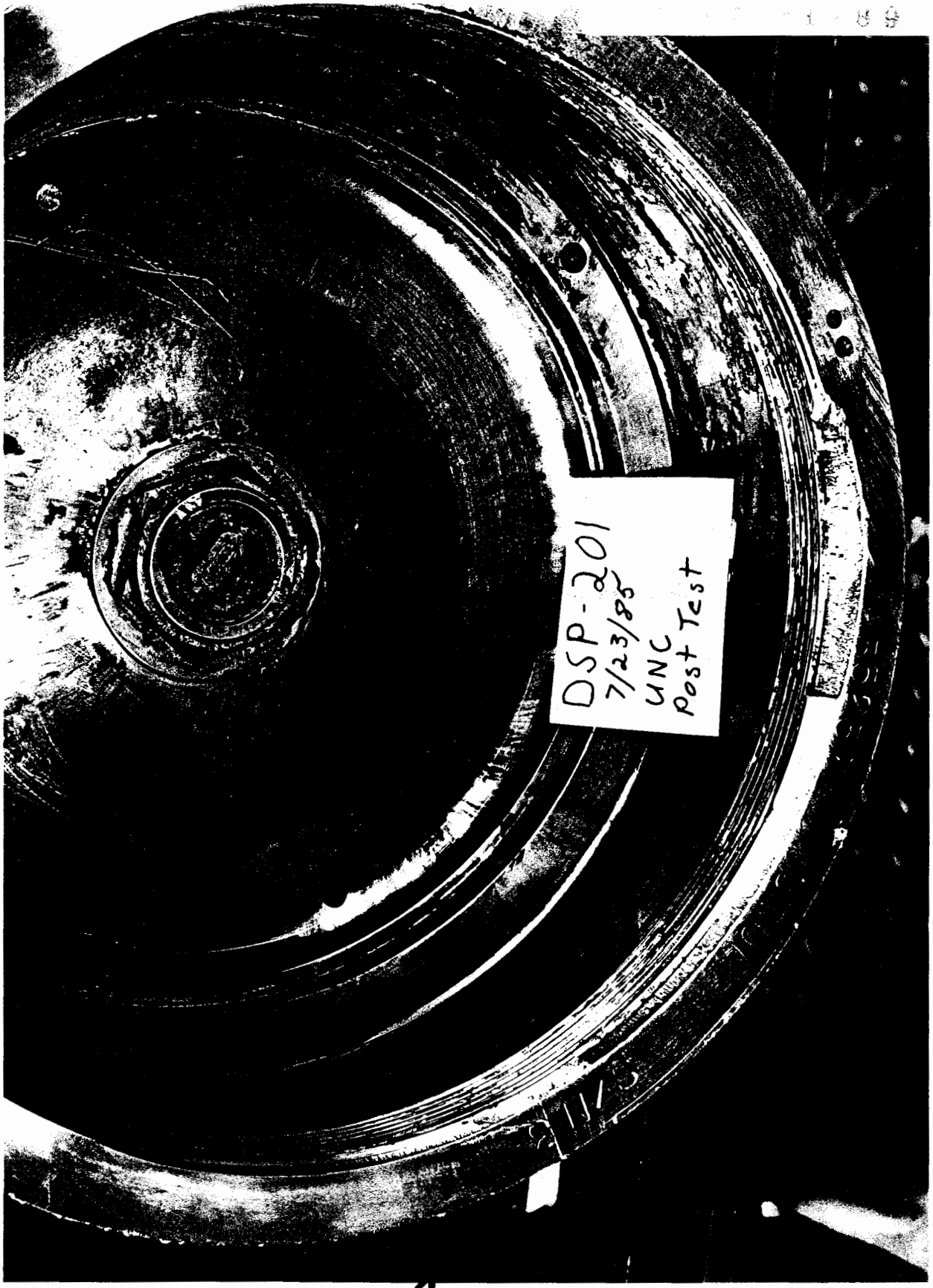

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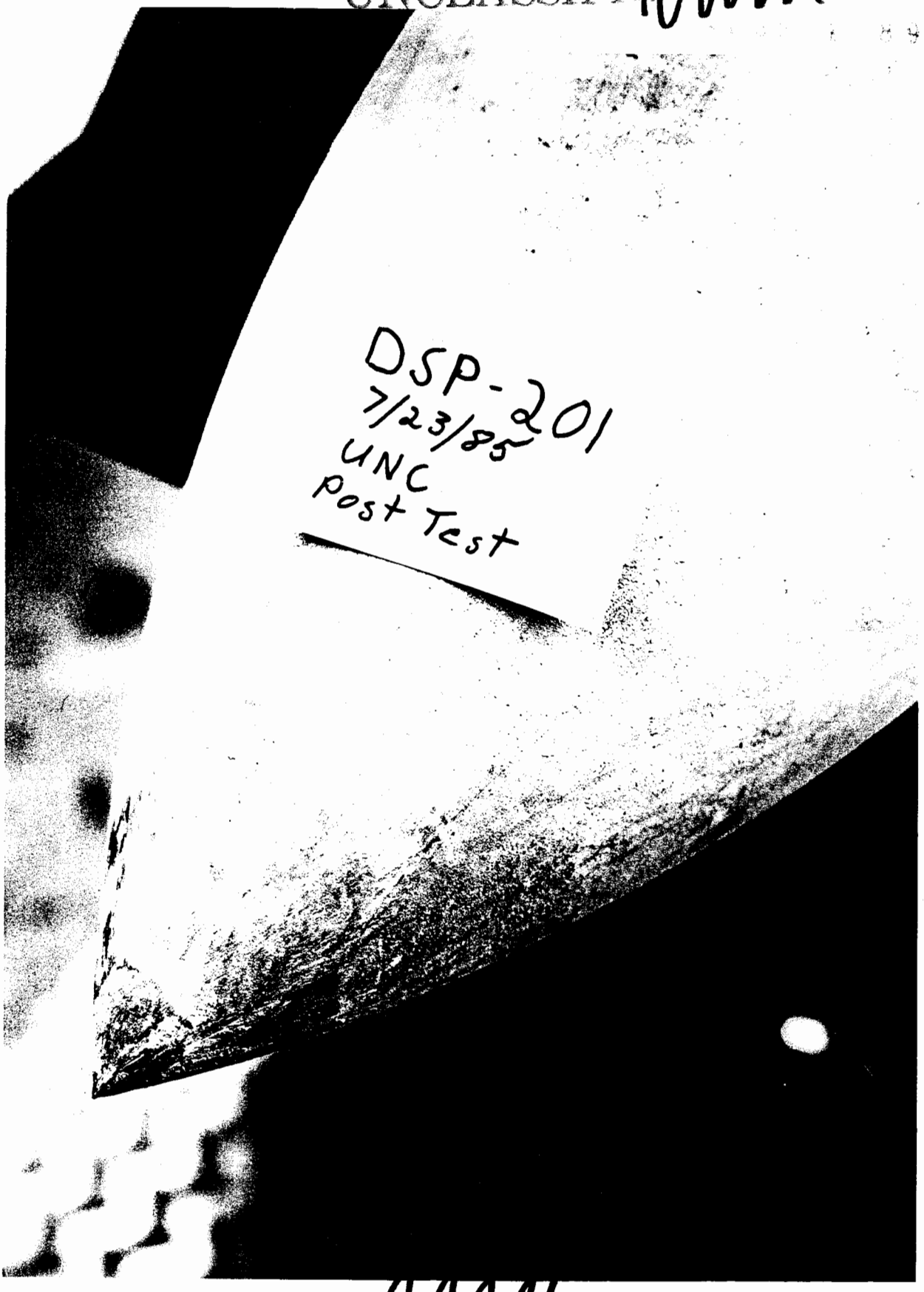

SECRET

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