# DONALD C. COOK NUCLEAR PLANT, UNIT 2
# REACTOR VESSEL NOZZLE BORE
# DATA EVALUATION

**FINAL REPORT**
**SwRI Project 7804**

**Prepared for**

**American Electric Power Service Corporation**
**1 Riverside Plaza**
**Columbus, Ohio 43216-6631**

**Prepared by**

**Nondestructive Evaluation Science and Technology Division**

**August 1996**

SOUTHWEST RESEARCH INSTITUTE
SAN ANTONIO HOUSTON
DETROIT WASHINGTON, DC

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# I. INTRODUCTION AND SUMMARY

The 1996 reactor vessel examinations (April-May refueling outage) at Donald C. Cook Nuclear Plant, Unit 2 (Cook 2), were performed to satisfy the requirements for the second 10-year interval of plant operation per American Society of Mechanical Engineers (ASME) Section XI (1983 Edition) as well as the augmented examinations required by 10CFR50.55. The examinations were conducted by Southwest Research Institute (SwRI) using SwRI's Fast PaR device and Enhanced Data Acquisition System-II (EDAS-II™). The reactor vessel shell welds were examined using procedures qualified under the Performance Demonstration Initiative (PDI) guidelines which implement ASME Appendix VIII requirements. Examinations of the nozzle-to-shell welds, nozzle inner radius sections, and the nozzle-to-safe end welds from the nozzle bore were performed using procedures (DCC-AUT14/1/0 and DCC-AUT15/1/0) written to ASME 1983 Edition of Section XI requirements.

The nozzle-to-shell weld examinations conducted from the nozzle bore were performed using an incorrect pulser preamp switch setting. This caused the actual examination sensitivity to be lower than the calibration sensitivity. This error was not discovered until after the completion of examinations, and at that time it was determined that a reexamination effort would have an adverse impact on the outage schedule. After conferencing with regulatory personnel, the plant staff decided to request relief for those examinations and investigate the opportunity to perform a meaningful analysis of the data as acquired.

After conducting a detailed and enhanced analysis of the existing data, it was determined that it was possible to identify those indications which exceeded the Code and Regulatory Guide equivalent evaluation thresholds. The existing data does not allow a complete sizing evaluation using Code or Regulatory Guide criteria. However, since a known flaw, detected from the bore and sized from the vessel outside surface during previous examinations, was also detected at the reduced sensitivity, it is possible to draw some inferences about the indications that were identified. Again this outage, the known flaw was sized independently from the outside surface of the vessel, and it displayed the same dimensions as it did in 1988 and 1990. All of the remaining indications identified during the enhanced analysis of the detection data were lower in amplitude than the known acceptable flaw, and after applying Code-style sizing calculations to the existing enhanced detection data, all of the measured dimensions were less than the similar measurements for the known flaw.

The existence of slag-type nozzle fabrication flaws is fairly well known within the nuclear industry with several documented cases of these flaws having been discovered through preservice and inservice inspection. The nozzle joint design is such that arc control is difficult and one of the most common outcomes is the accumulation of slag along the side walls of the joint. While it is difficult to precisely characterize ultrasonic indications with respect to the exact type of flaw, our experience in conducting these nozzle bore examinations is that such fabrication flaws are relatively common and that, in most cases, the indications have been documented for many years. In the case of the Cook 2 vessel, CB&I report "Investigation of Nozzle Weld Repairs On AMP Reactor Pressure Vessel", dated October 11, 1972, documents the existence of nozzle weld repairs made during vessel fabrication and also states that some fabrication flaws were accepted and left in the welds.

Six of the nozzle-to-shell welds at Cook 2 have been examined from the bore twice previously (once preservice and once inservice) using similar techniques and two of the nozzles have been examined three times previously (once preservice and twice inservice). Each of these examinations revealed some indications which required evaluation, but only one indication was determined to be unacceptable based on the initial evaluation results. This was the indication that was sized in 1988 (and again in 1990) using a tip-diffraction technique from the outside surface of the vessel and determined to be acceptable.

Based on SwRI's experience with nozzle bore examinations over the past 25 years, it is believed that, although the 1996 examinations were not performed at the proper gain setting, the enhanced analysis (as described in Section II) provided the opportunity to review the data in a manner that provided a high level of confidence. It is also felt that the results of these examinations are consistent with other examination experiences and that there is no reason to suspect that any new or unusual flaws exist in the Cook 2 nozzle welds.

## II. ENHANCED DATA ANALYSIS

While it was known that the examination data was not acquired at the required gain settings, it was felt that the characteristics of the EDAS-II system were such that an effective data review could be accomplished even at the lower gain setting. In order to perform an effective review of the data, SwRI performed the following tasks.

Upon return to SwRI, the entire examination system was reconstructed in the same configuration as used at Cook 2. The appropriate calibrations were downloaded to the system and verifications were performed to assure that the system was operating as it did at the plant. An empirical approach was used to determine "equivalent 50% and 20% thresholds" for each acquisition channel used during the examination. These thresholds were determined by (1) obtaining 50% and 20% reference signals through the entire examination system at calibration sensitivity, and then (2) recording the corresponding signal amplitude after the switch was changed to the incorrect setting used for examination.

Since EDAS-II digitizes and records the full video waveform at 10-bit resolution, it was possible to enhance the data display and then compare the recorded data to the derived thresholds to identify the indications that exceeded those thresholds. The enhanced data display provided improved amplitude resolution and allowed the analyst to view the data in a manner more consistent with normally acquired data sets. Although the data were acquired using detection scan increments which are larger than typical sizing increments, length and throughwall sizing calculations were made for each indication for evaluation purposes.

## III. ANALYSIS RESULTS

ASME Section XI and Regulatory Guide 1.150 require that all indications exceeding 50% DAC located in the outer 75% of the vessel shell be recorded and evaluated. Table A identifies 11 indications (including the known flaw) located in the outer 75% of the vessel shell which exceeded the equivalent 50% threshold. Information on indication location and correlation with previous examination data is also provided for each indication. See Figure 1 for azimuth locations.

Indications located in the inner 25% of the vessel shell are required to be recorded and evaluated if they exceed 20% DAC. No indications were observed in the inner 25% of the vessel shell that exceeded the equivalent 20% threshold.

Table B provides the amplitude-based throughwall and length sizing information that was calculated for each indication that exceeded the equivalent appropriate threshold. Although it is well known that throughwall measurements based upon amplitude are not typically accurate with respect to true flaw size, these calculations were made primarily for comparison purposes to the known flaw. Also, while the throughwall measurements may not be absolutely conservative, the length measurements are conservative because of the technique used for the calculations.

While the fact that the indications did not receive complete evaluation may be of some concern, it should be noted that 5 of the 11 were within 2 dB (normal Code calibration tolerance) of the 50% threshold (see Figure 2). Due to the normal variances that occur when applying Code procedures, it is quite possible that some of these would not have exceeded the evaluation threshold if the examinations had been performed at the proper gain setting. Also, due to the normal probability of false calls, had the indications been completely evaluated, it is likely that some, particularly those that could not be correlated with previous data, would have been determined to be nonrelevant (e.g., caused by transducer liftoff).

Based on the analysis performed, SwRI is confident that any recorded indication which would have exceeded 50% DAC (or 20% DAC for the inner 1/4T) has been identified. Although it is not possible to complete the required evaluation steps for the identified indications, it is felt that, based on SwRI's experience, the enhanced initial detection data presentation and results obtained are comparable to other nozzle examinations at Cook 2 and other plants.

Appendix A contains indication plots and Appendix B contains EDAS-II evaluation data for the 11 indications reported.

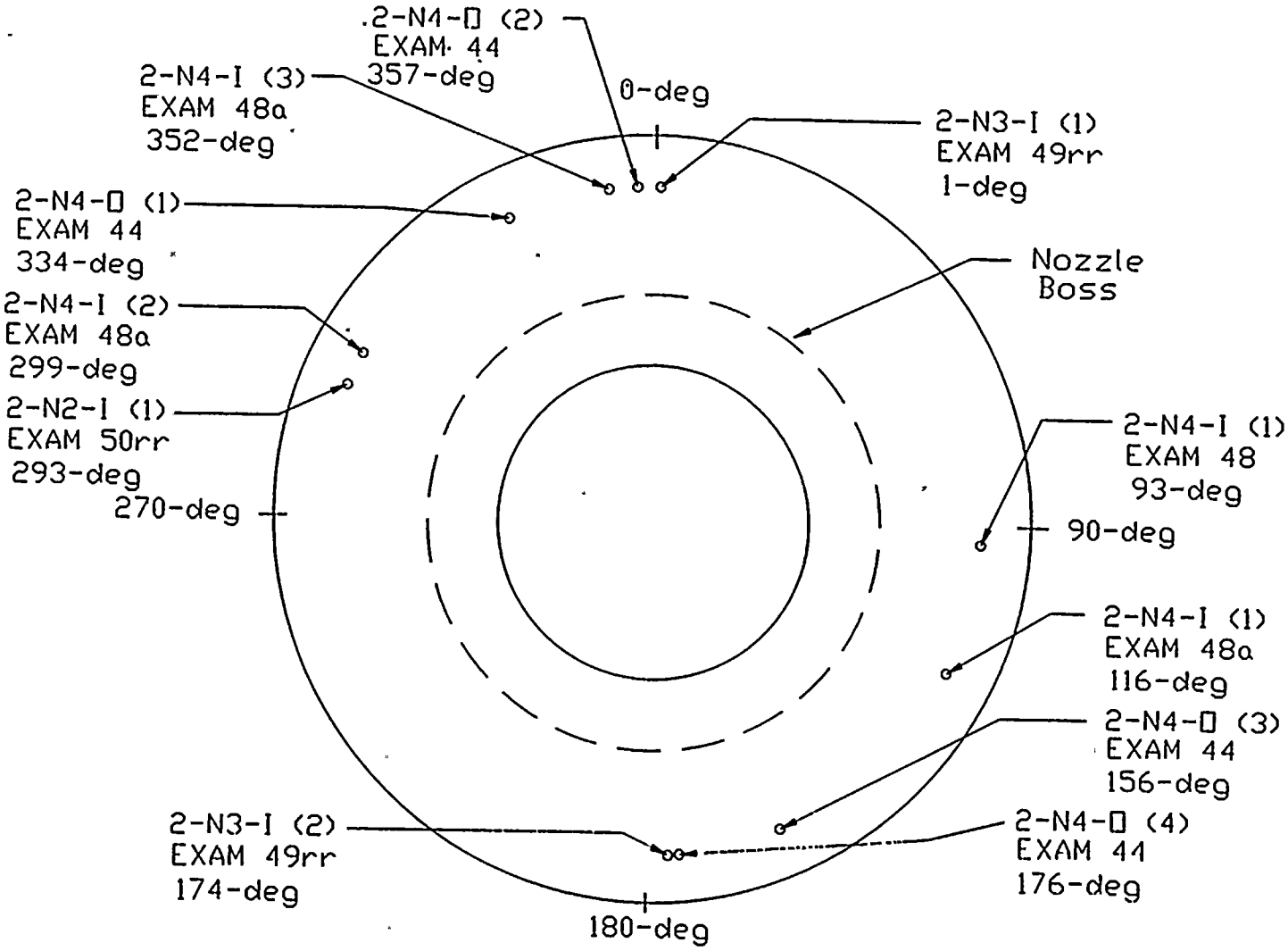



Figure 1. Donald C. Cook, Unit 2, Nozzle Bore Indications (Azimuth Locations)

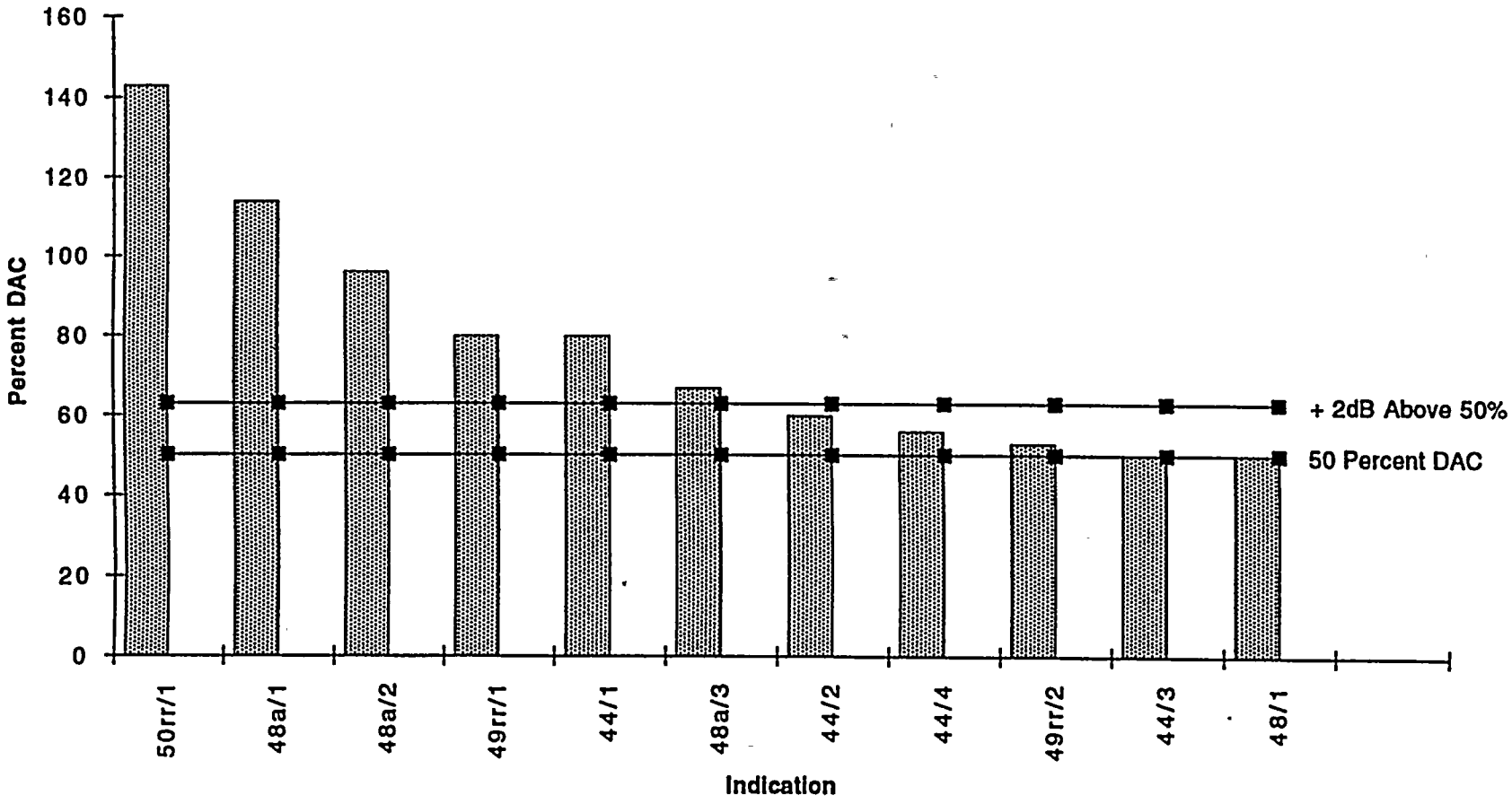



Figure 2. Indication Amplitude Chart

DONALD C. COOK UNIT 2

DETECTION EVALUATION / CORRELATION OF PREVIOUS DATA

Table A

| Nozzle Identification | Exam No. | Ind. No. | Ind. Azm (Deg) | Ind. Amp. % DAC | Indication Inner 1/4 t | Indication Outer 3/4 t | 1996 Transverse Confirmation | 1988 Bore Confirmation | 1984 Bore Confirmation | 1977 Bore Confirmation |
|---|---|---|---|---|---|---|---|---|---|---|
| 2-N4-O @ 22-Deg | 44 | 1 | 334 | 80 | N | Y | N | ** | N | N |
| | | 2 | 357 | 60 | N | Y | N | ** | N | Y(1) |
| | | 3 | 156 | 50 | N | Y | N | ** | N | N |
| | | 4 | 176 | 56 | N | Y | N | ** | N | Y(1) |
| 2-N4-I @ 67-Deg | 48 | 1 | 93 | 50 | N | Y | N | N | ** | N |
| 2-N4-I @ 67-Deg | 48a | 1 | 116 | 114 | N | Y | N | N | ** | N |
| | | 2 | 299 | 96 | N | Y | N | N | ** | N |
| | | 3 | 352 | 67 | N | Y | N | N | ** | N |
| 2-N3-I @ 113-Deg | 49rr | 1 | 1 | 80 | N | Y | N | Y(1) | ** | Y(1) |
| | | 2 | 174 | 53 | N | Y | N | Y(1) | ** | N |
| 2-N2-I @ 247-Deg | 50rr | 1 | 293 | 143 | N | Y | N | Y(2) | ** | Y(1) |
| | | | | | | | | | | |
| | | | | | | | | | | |

**No exam performed

1988 Code Allowable Flaw - Confirmed Sizing In 1990 and 1996

Y(1) - Below Code Recording Threshold

Y(2) - At or Above Code Recording Threshold

Y - Yes

N - No

DONALD C. COOK UNIT 2

1996 ISI - SIZING EVALUATION

Table B

| Nozzle Identification | Exam No. | Ind. No. | Ind. Azm (Deg) | ASME Length Meas. (inch) | 2a | a | a/l | a/t (%) | a/t Allow. (%) | s |
|---|---|---|---|---|---|---|---|---|---|---|
| 2-N4-O @ 22-Deg | 44 | 1 | 334 | 2.38 | 1.26 | 0.65 | 0.27 | 6.2 | 3.8 | 2.66 |
| | | 2 | 357 | 1.22 | 0.37 | 0.20 | 0.16 | 1.9 | 3.0 | 4.70 |
| | | 3* | 156 | 1.29 | 0.14 | 0.16 | 0.12 | 1.5 | 2.7 | 0.00 |
| | | 4 | 176 | 1.29 | 0.36 | 0.20 | 0.16 | 1.9 | 3.0 | 4.10 |
| 2-N4-I @ 67-Deg | 48 | 1 | 93 | 1.24 | Spot | - | - | - | - | - |
| 2-N4-I @ 67-Deg | 48a | 1* | 116 | 1.88 | 1.36 | 1.55 | 0.50 | 14.8 | 3.5 | 0.18 |
| | | 2 | 299 | 1.90 | 1.05 | 0.55 | 0.29 | 5.2 | 4.0 | 0.75 |
| | | 3 | 352 | 2.51 | 1.38 | 0.70 | 0.28 | 6.7 | 3.8 | 0.72 |
| 2-N3-I @ 113-Deg | 49rr | 1 | 1 | 2.45 | 1.34 | 0.65 | 0.27 | 6.2 | 3.8 | 2.73 |
| | | 2 | 174 | 1.28 | Spot | - | - | - | - | - |
| 2-N2-I @ 247-Deg | 50rr | 1* | 293 | 3.75 | 1.53 | 1.7 | 0.45 | 16.2 | 3.5 | 0.16 |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

cookclv11

▒ 1988 Code allowable flaw- Confirmed sizing in 1990 and 1996

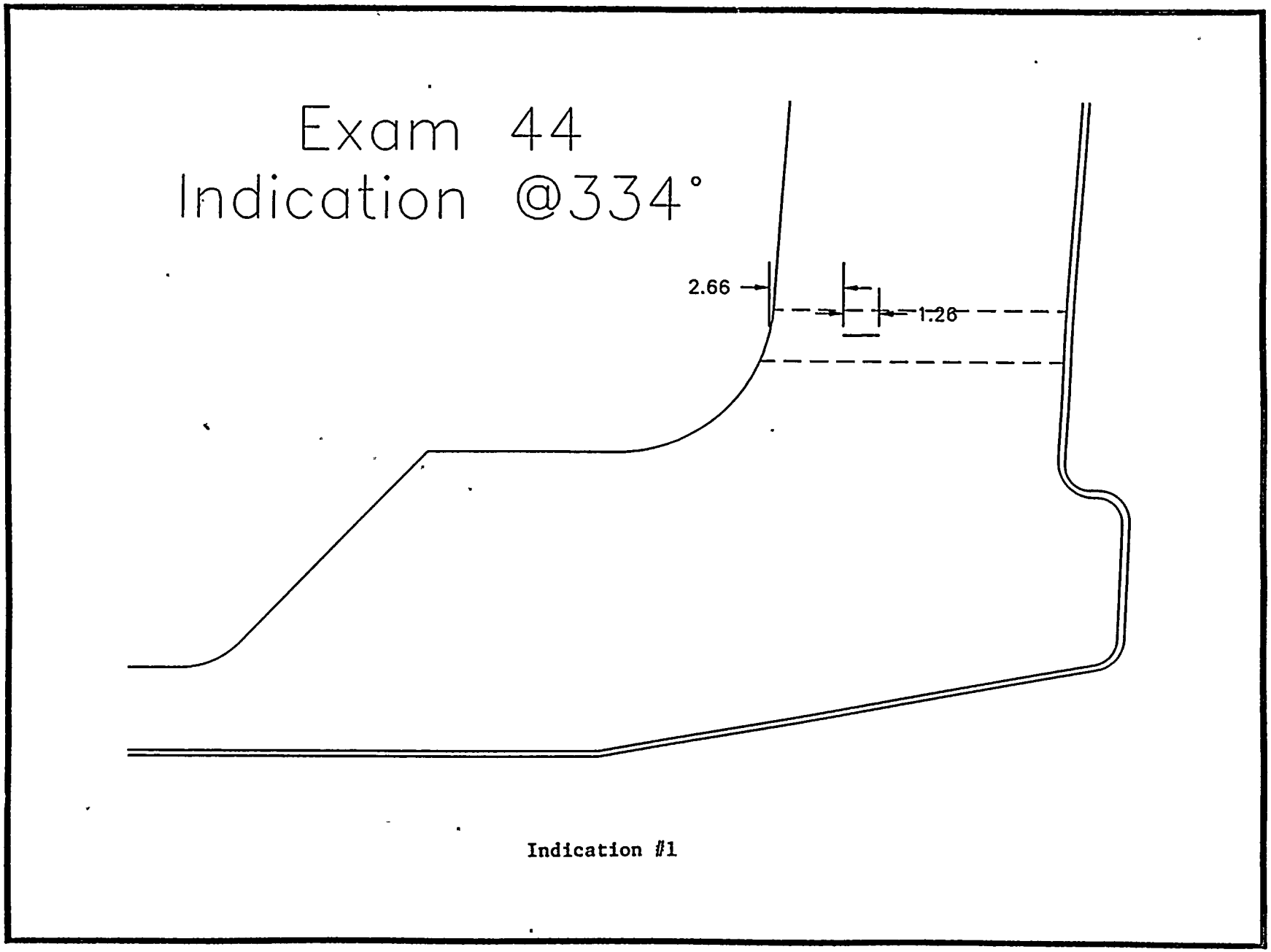
Length measurements are considered conservative

t = 10.5 inches, sizing was performed in accordance with the 1983 Edition of Section XI, Tables IWB 3510 and IWB 3512

* Surface indications

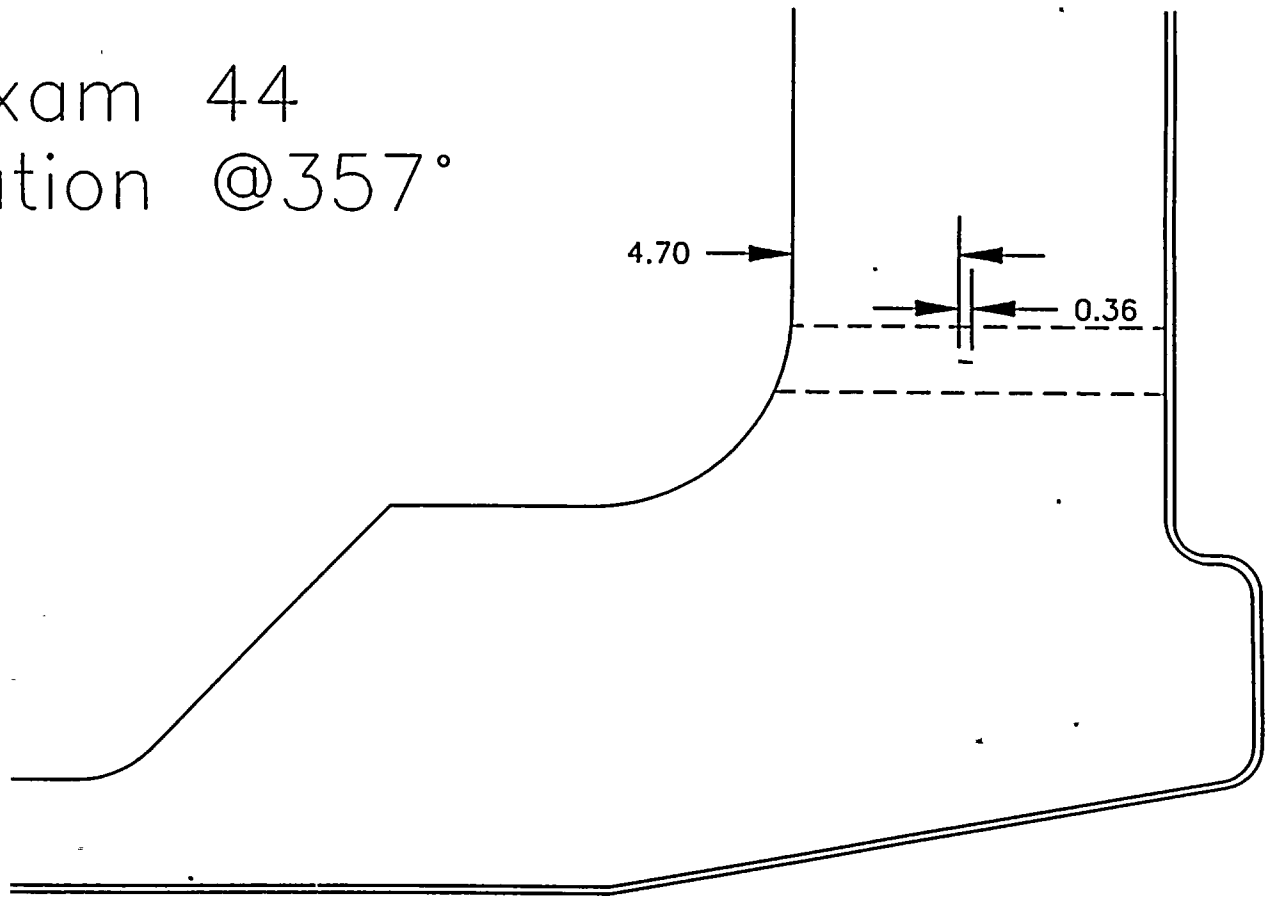
# APPENDIX A

# INDICATION LOCATION PLOTS

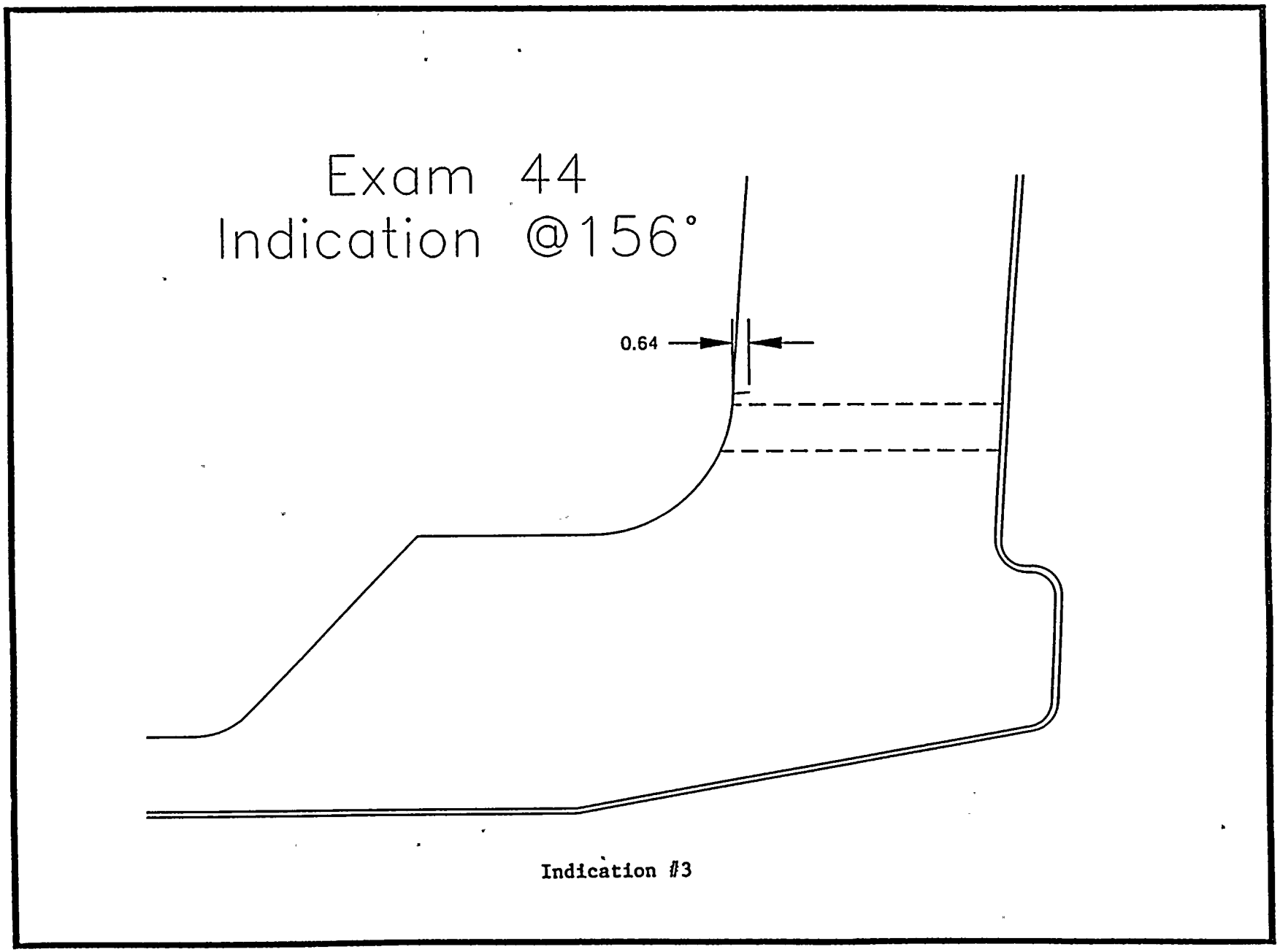



Indication #1

Exam 44
Indication @357°

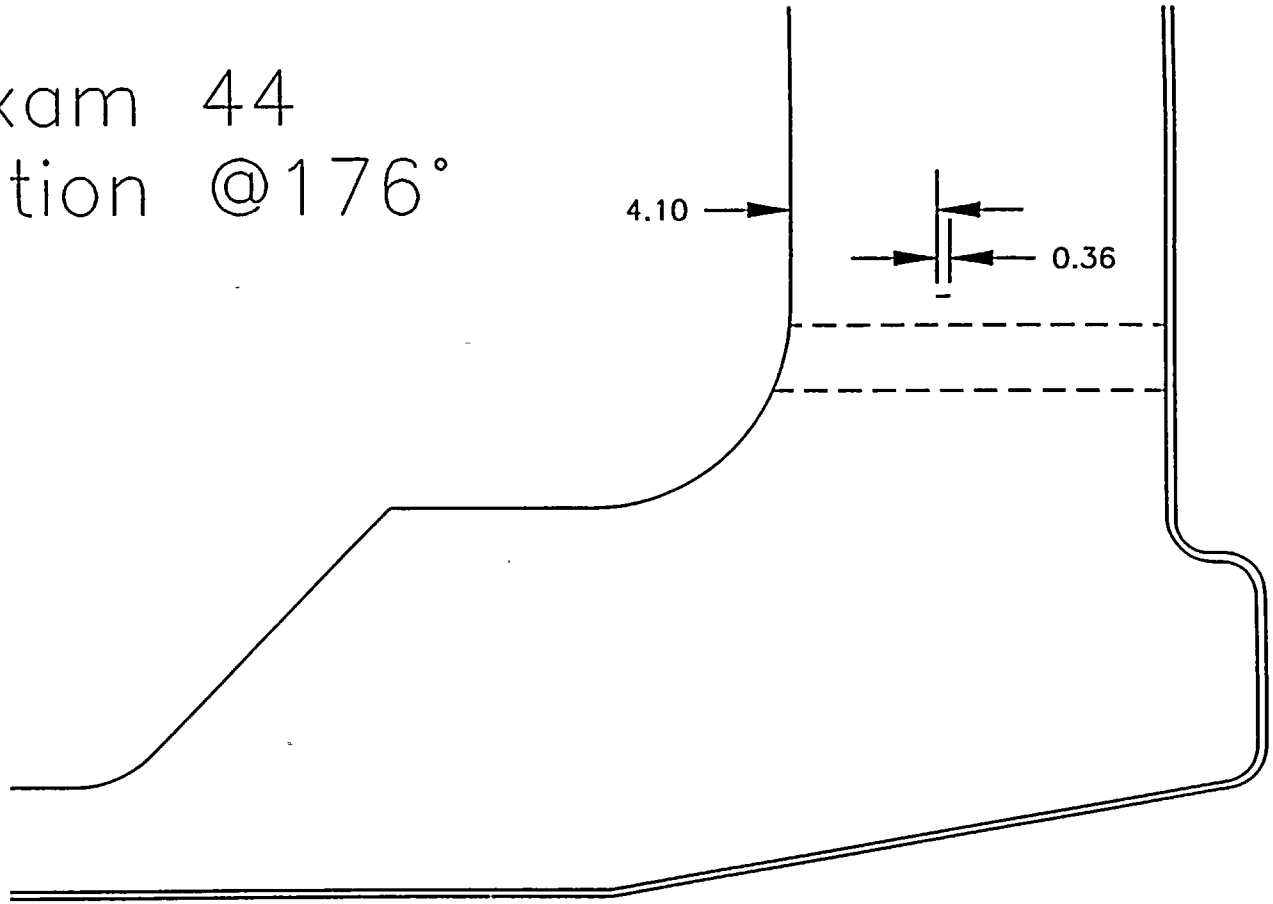



Indication #2



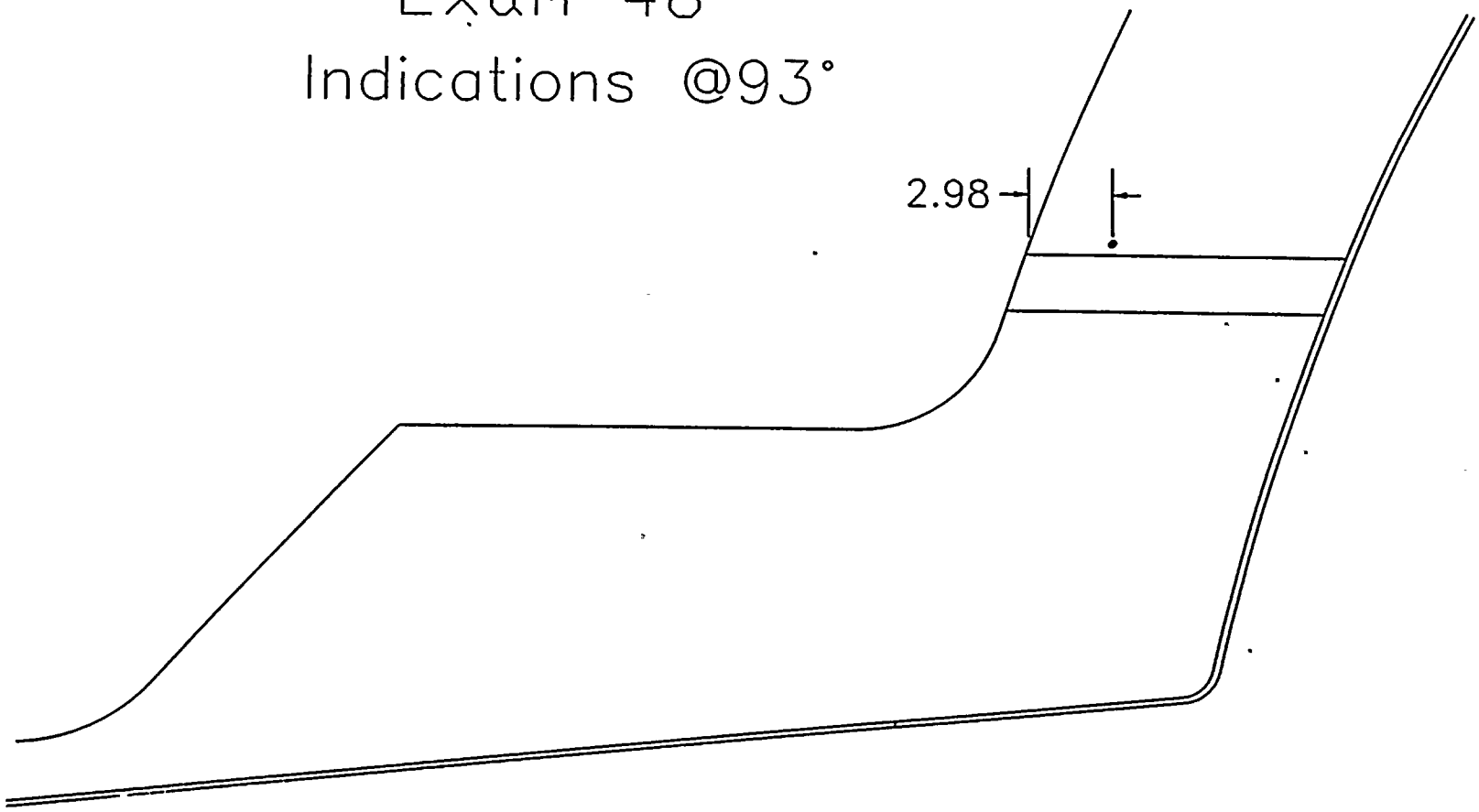

Indication #3

Exam 44
Indication @176°

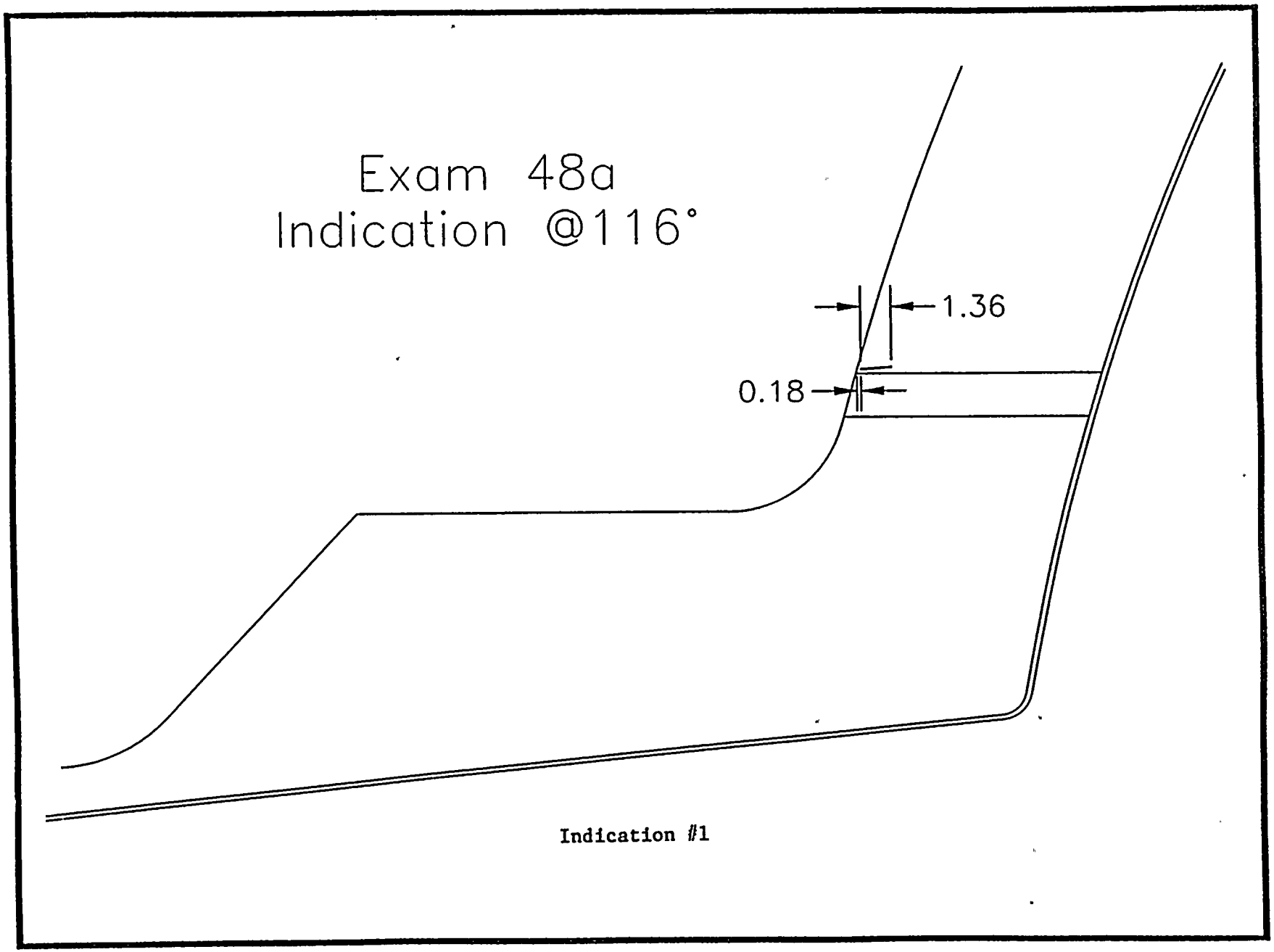



Indication #4

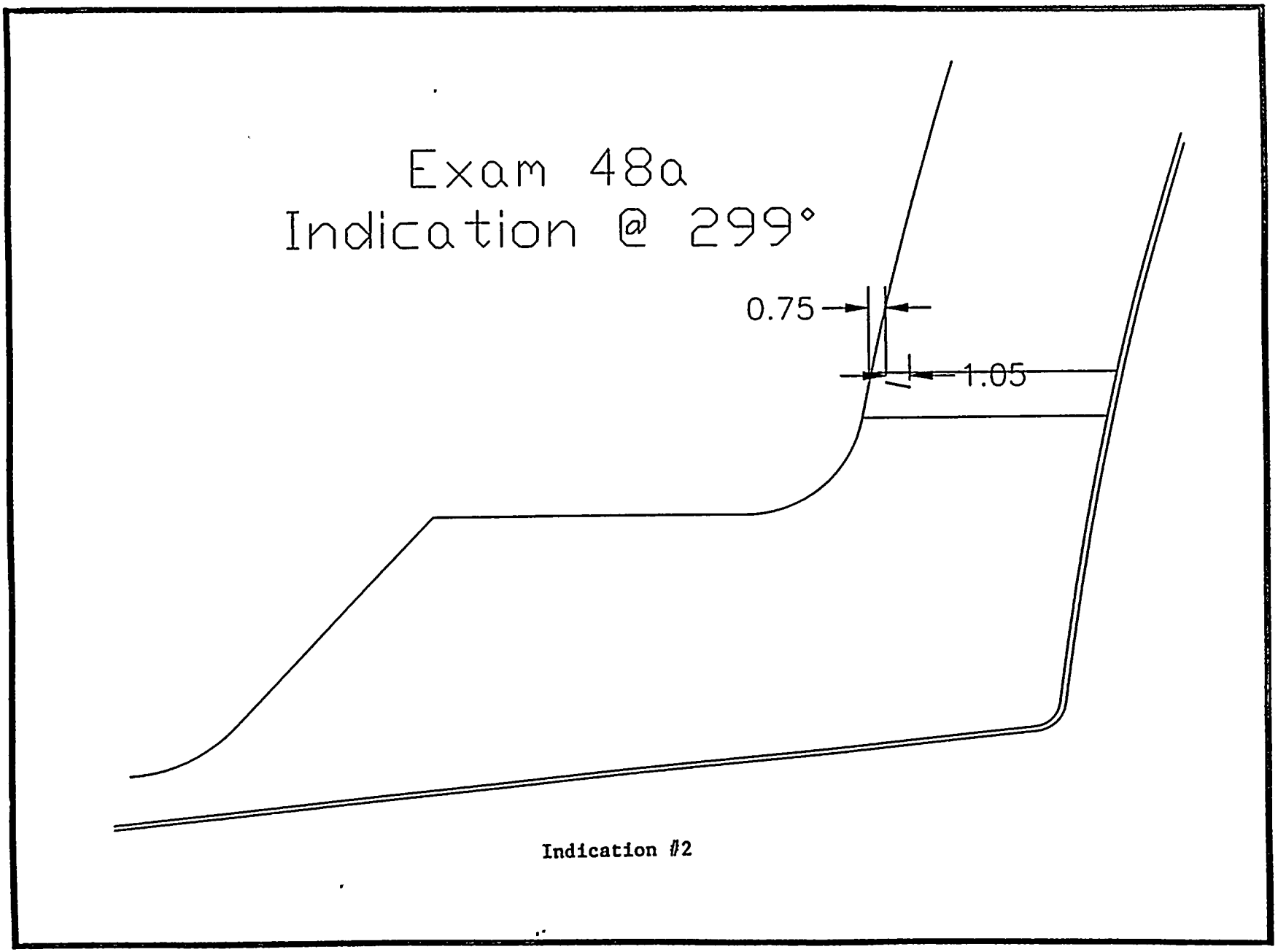
# Exam 48
## Indications @93°




Indication #1

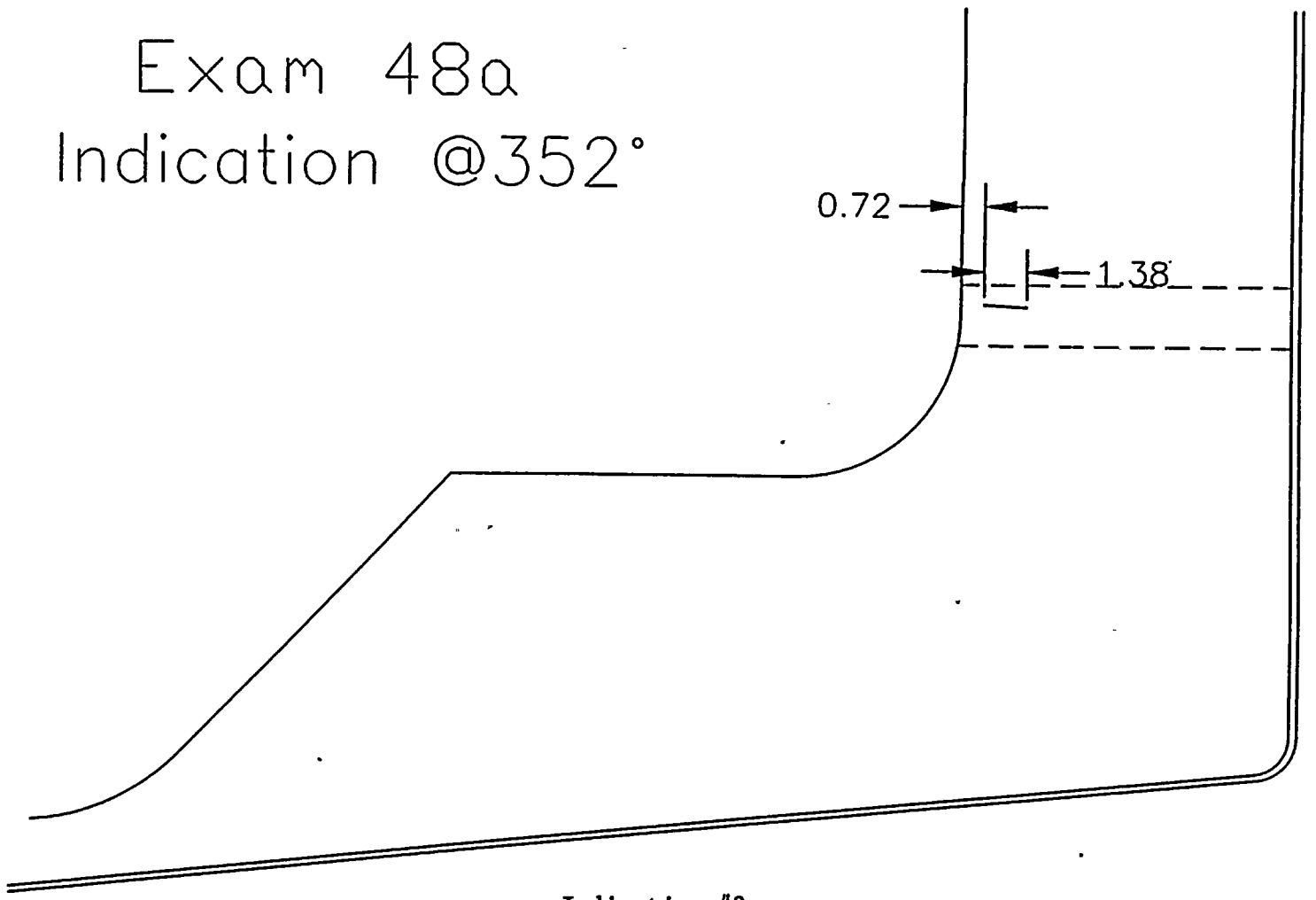



Indication #1

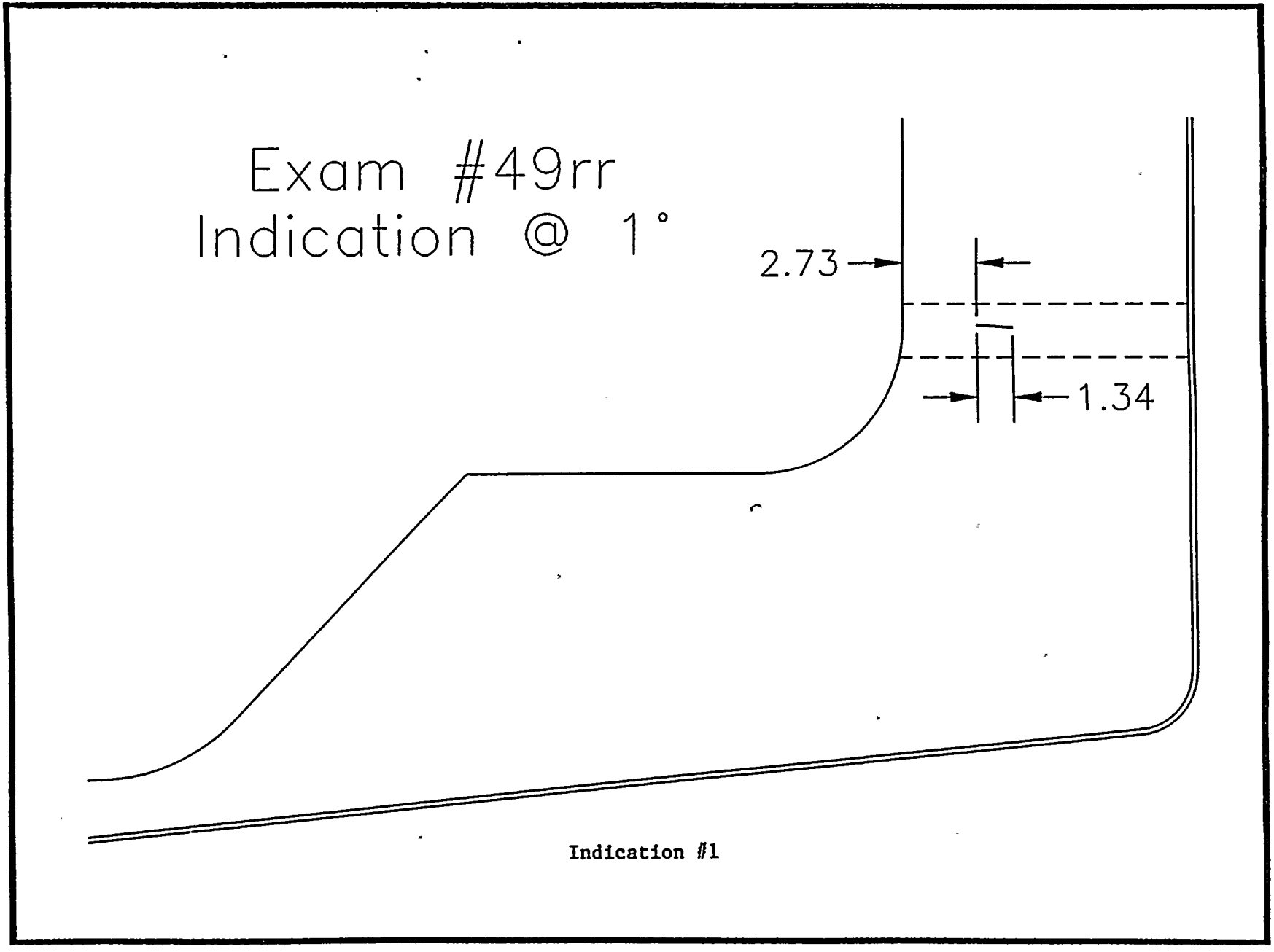



Indication #2

Exam 48a
Indication @352°

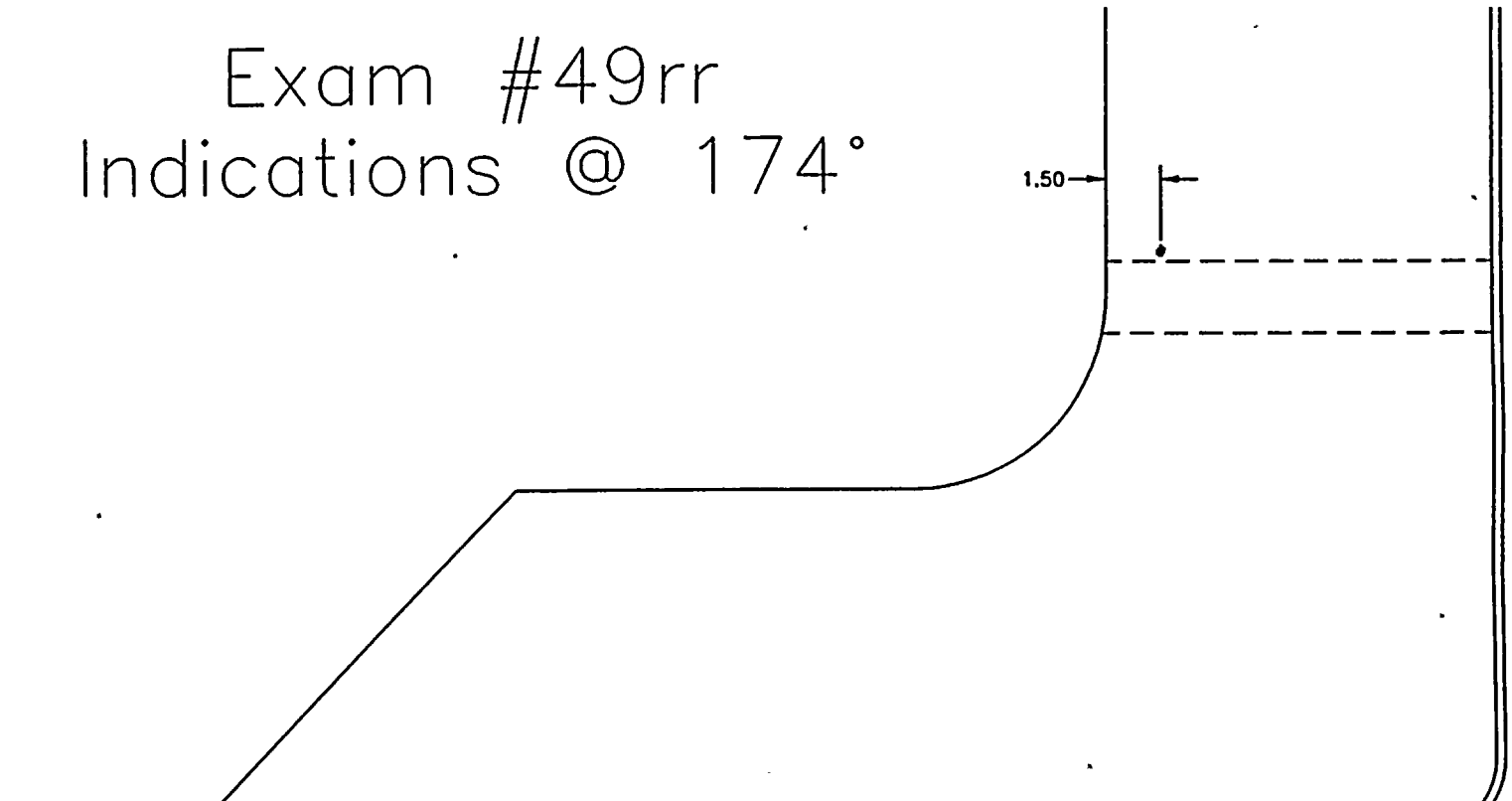



Indication #3

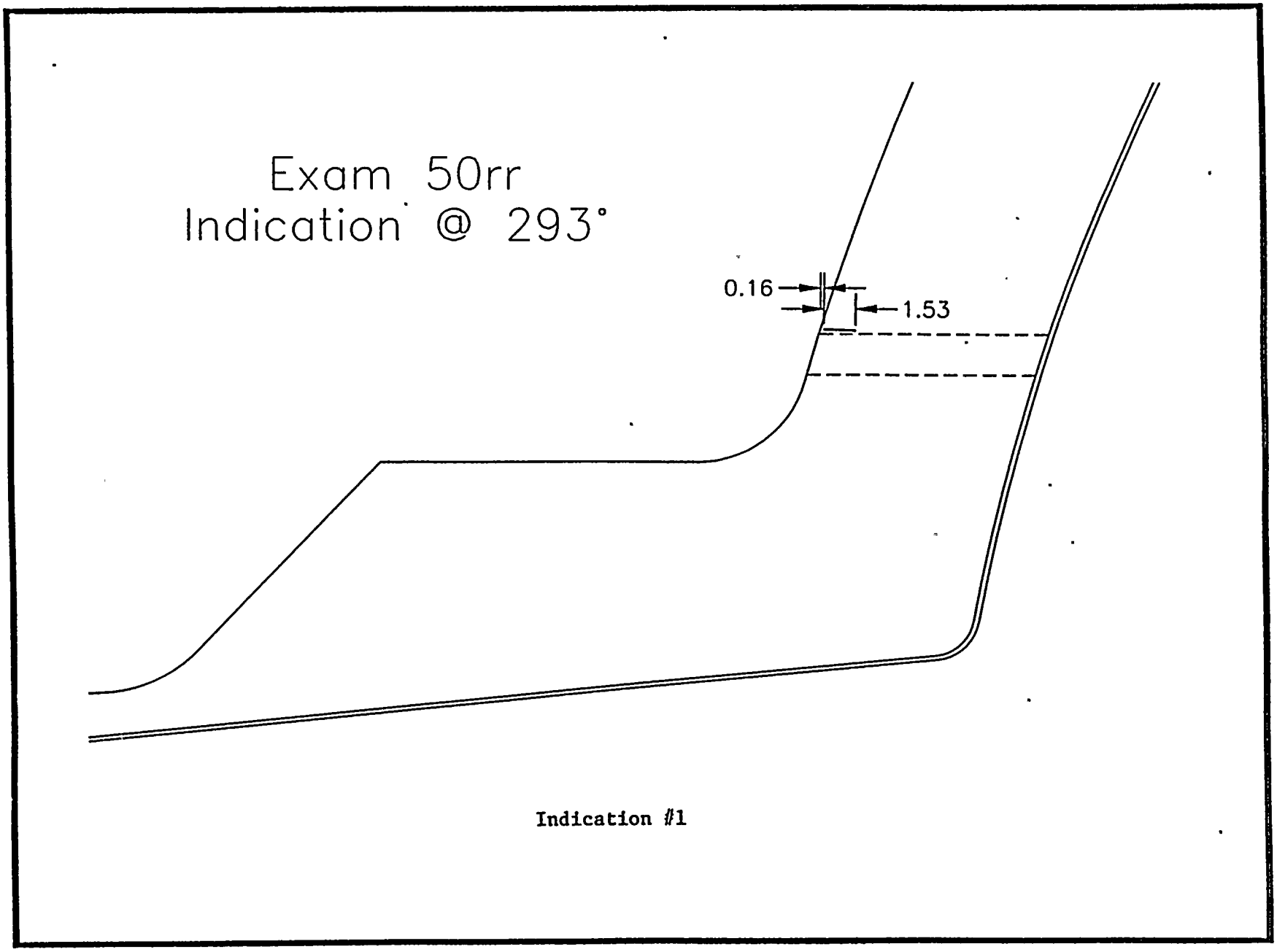



Indication #1

# Exam #49rr
# Indications @ 174°




Indication #2




Indication #1

# APPENDIX B

# EDAS-II EVALUATION DATA

DC Cook Unit 2
2-N4-O
Outlet Noz. Bore @ 22 deg. Looking TWD

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Cursor Box 1 of 5

| | |
|---|---|
| Scan Axis | 16.45 - 17.69 |
| Inc. Axis | 211.67 - 222.47 |
| Depth In Material | 3.93 - 5.02 |

Channel 1

Module Coordinates

| | |
|---|---|
| Inc. Axis | - |
| Scan Axis | 23.57 - 24.81 |

Channel 2

Module Coordinates

| | |
|---|---|
| Inc. Axis | - |
| Scan Axis | 20.33 - 21.57 |

Channel 3

Module Coordinates

| | |
|---|---|
| Inc. Axis | 33.73 - 44.62 |
| Scan Axis | 23.57 - 24.81 |

Channel 4

Module Coordinates

| | |
|---|---|
| Inc. Axis | 28.92 - 39.82 |
| Scan Axis | 20.33 - 21.57 |

Channel 4
Summary

Feature Analysis
Comments
: Enhanced Analysis
:
:
:

---

| | |
|---|---|
| Cursor Box 2 of 5 | |
| Scan Axis | 20.45 - 22.29 |
| Inc. Axis | 329.27 - 340.07 |
| Depth In Material | 12.81 - 13.41 |

Channel 1

| | |
|---|---|
| Module Coordinates | |
| Inc. Axis | - |
| Scan Axis | 36.45 - 38.29 |

Channel 2

| | |
|---|---|
| Module Coordinates | |
| Inc. Axis | - |
| Scan Axis | 25.89 - 27.73 |

Channel 3

| | |
|---|---|
| Module Coordinates | |
| Inc. Axis | 151.33 - 162.13 |
| Scan Axis | 36.45 - 38.29 |

Channel 4

| | |
|---|---|
| Module Coordinates | |
| Inc. Axis | 146.61 - 157.34 |
| Scan Axis | 25.89 - 27.73 |

| Feature Analysis | Channel 4 Planar | |
|---|---|---|
| Reference Points | | |
| Inc. Axis Location | 335.21 | 334.00 |
| Surface Location | 23.29 | 24.57 |
| Scan Axis Location | 21.01 | 22.25 |
| Depth In Material | 12.99 | 13.20 |
| Metal Path | 13.19 | 13.40 |
| Time | 118.4 | 120.3 |
| % DAC | 38 | 39 |
| Separation | 1.26 | |
| Inc. Axis Values | | |
| Scan No. Limits | 122 | 126 |
| Inc. Axis Limits | 332.91 | 337.58 |
| Depth | 13.17 | |
| Length | 2.38 | |
| Maximum Point | | |
| % DAC | 66 | |
| Inc. Axis Location | 334.00 | |
| Surface Location | 24.33 | |
| Scan Axis Location | 22.01 | |
| Depth In Material | 13.17 | |
| Metal Path | 13.37 | |
| Time | 120.0 | |
| Comments | | |
| : | Ind # 1 with Enhanced Evaluation | |
| : | | |

---

Cursor Box 3 of 5

| | |
|---|---|
| Scan Axis | 20.13 - 21.93 |
| Inc. Axis | 168.48 - 179.28 |
| Depth In Material | 14.50 - 14.95 |

Channel 1

Module Coordinates

| | |
|---|---|
| Inc. Axis | 170.53 - 181.33 |
| Scan Axis | 37.81 - 39.61 |

Channel 2

Module Coordinates

| | |
|---|---|
| Inc. Axis | 165.72 - 176.52 |
| Scan Axis | 25.89 - 27.69 |

Feature Analysis — Channel 2 Planar

Reference Points

| | | |
|---|---|---|
| Inc. Axis Location | 175.60 | 175.60 |
| Surface Location | 23.73 | 24.09 |
| Scan Axis Location | 21.13 | 21.49 |
| Depth In Material | 14.74 | 14.78 |
| Metal Path | 14.97 | 15.01 |
| Time | 134.4 | 134.7 |
| % DAC | 39 | 43 |
| Separation | 0.36 | |

Inc. Axis Values

| | | |
|---|---|---|
| Scan No. Limits | 140 | 142 |
| Inc. Axis Limits | 174.41 | 176.80 |
| Depth | 14.78 | |
| Length | 1.29 | |

Maximum Point

| | |
|---|---|
| % DAC | 46 |
| Inc. Axis Location | 175.60 |
| Surface Location | 23.85 |
| Scan Axis Location | 21.25 |
| Depth In Material | 14.78 |
| Metal Path | 15.01 |
| Time | 134.7 |

Comments

Ind # 4 Enhanced Analysis

| | Channel 3 |
|---|---|
| Module Coordinates | |
| Inc. Axis | - |
| Scan Axis | 37.81 - 39.61 |

| | Channel 4 |
|---|---|
| Module Coordinates | |
| Inc. Axis | - |
| Scan Axis | 25.89 - 27.69 |

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| | |
|---|---|
| Cursor Box 4 of 5 | |
| Scan Axis | 24.65 - 26.53 |
| Inc. Axis | 155.28 - 158.88 |
| Depth In Material | 14.88 - 15.44 |

| | Channel 1 |
|---|---|
| Module Coordinates | |
| Inc. Axis | 157.34 - 160.92 |
| Scan Axis | 42.73 - 44.61 |

| | Channel 2 |
|---|---|
| Module Coordinates | |
| Inc. Axis | 152.54 - 156.12 |
| Scan Axis | 30.49 - 32.37 |

| | Channel 2 | Planar |
|---|---|---|
| Feature Analysis | | |
| Reference Points | | |
| Inc. Axis Location | 156.40 | 156.40 |
| Surface Location | 28.13 | 28.29 |
| Scan Axis Location | 25.45 | 25.61 |
| Depth In Material | 15.13 | 15.17 |
| Metal Path | 15.36 | 15.40 |
| Time | 137.9 | 138.2 |
| % DAC | 41 | 41 |
| Separation | 0.16 | |

| | | |
|---|---|---|
| Inc. Axis Values | | |
| Scan No. Limits | 124 | 126 |
| Inc. Axis Limits | 155.22 | 157.59 |
| Depth | 15.13 | |
| Length | 1.29 | |
| Maximum Point | | |
| % DAC | 41 | |
| Inc. Axis Location | 156.40 | |
| Surface Location | 28.13 | |
| Scan Axis Location | 25.45 | |
| Depth In Material | 15.13 | |
| Metal Path | 15.36 | |
| Time | 137.9 | |
| Comments | | |
| : | Ind # 3 Enhanced Analysis | |
| : | | |
| : | | |
| : | | |

Channel 3

| | |
|---|---|
| Module Coordinates | |
| Inc. Axis | - |
| Scan Axis | 42.73 - 44.61 |

Channel 4

| | |
|---|---|
| Module Coordinates | |
| Inc. Axis | - |
| Scan Axis | 30.49 - 32.37 |

---

| | |
|---|---|
| Cursor Box 5 of 5 | |
| Scan Axis | 20.09 - 21.77 |
| Inc. Axis | 350.87 - 1.67 |
| Depth In Material | 12.46 - 13.34 |

Channel 1

| | |
|---|---|
| Module Coordinates | |
| Inc. Axis | - |
| Scan Axis | 35.77 - 37.45 |

Channel 2

Module Coordinates

| | | |
|---|---|---|
| Inc. Axis | - | |
| Scan Axis | 25.49 - 27.17 | |

Channel 3

| | |
|---|---|
| Module Coordinates | |
| Inc. Axis | 172.92 - 183.71 |
| Scan Axis | 35.77 - 37.45 |

Channel 4

| | |
|---|---|
| Module Coordinates | |
| Inc. Axis | 168.12 - 178.92 |
| Scan Axis | 25.49 - 27.17 |

| | Channel 4 Planar | |
|---|---|---|
| Feature Analysis | | |
| Reference Points | | |
| Inc. Axis Location | 356.79 | 356.79 |
| Surface Location | 23.13 | 23.49 |
| Scan Axis Location | 20.85 | 21.21 |
| Depth In Material | 12.85 | 12.95 |
| Metal Path | 13.05 | 13.15 |
| Time | 117.1 | 118.1 |
| % DAC | 41 | 41 |
| Separation | 0.37 | |
| Inc. Axis Values | | |
| Scan No. Limits | 141 | 143 |
| Inc. Axis Limits | 355.59 | 358.00 |
| Depth | 12.92 | |
| Length | 1.22 | |
| Maximum Point | | |
| % DAC | 49 | |
| Inc. Axis Location | 356.79 | |
| Surface Location | 23.41 | |
| Scan Axis Location | 21.13 | |
| Depth In Material | 12.92 | |
| Metal Path | 13.12 | |
| Time | 117.8 | |

Comments : Ind # 2 Enhanced Evaluation
:
:
:

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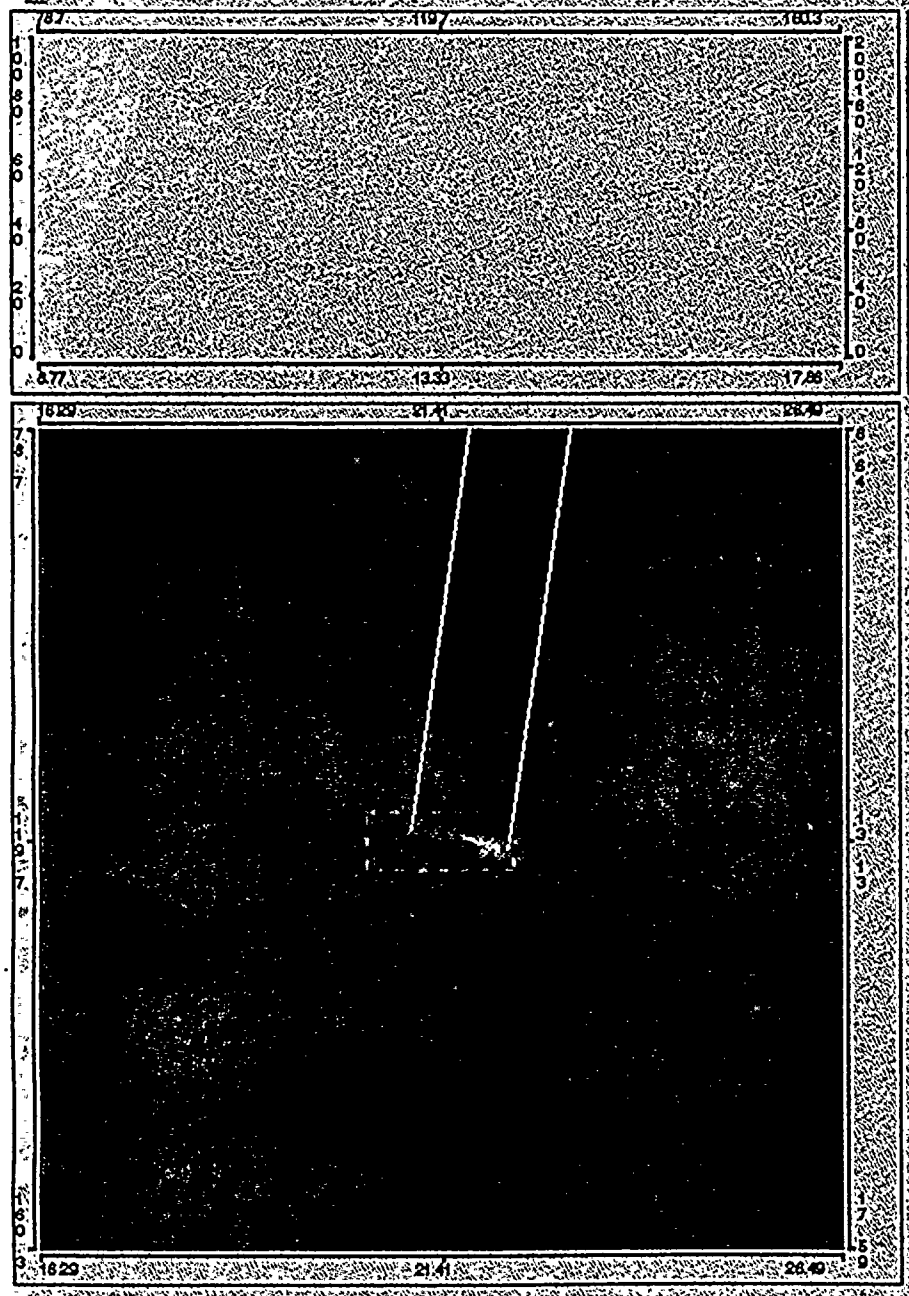
Reviewed By W. Clay L SNT Level III Date 8/5/96

EDAS B-Scan Display – Channel 4, Refracted Angle 10–, Exam NU… Exam 44




123 SCAN NO
334.00 INC AXIS
SCAN AXIS
TIME
METAL PATH
MATERIAL DEPTH
% SCREEN HEIGHT
% DAC

B-SCAN CONTROL OPTIONS

Next B-Scan

Previous B-Scan

A-SCAN CONTROL OPTIONS

Compressed Display

Replay Off

Direction Forward

Speed

Select Scan Axis

Lower 11.97

Upper 40.09

GEOMETRY OPTIONS

Mode Off

FEATURE ANALYSIS OPTIONS

Analyze Cursor Box

Inc 334.00

Scan 16.29

Depth 8.64

EDAS Feature Analysis – Ch…

Planar Analysis

Select Reference Point

| Point 1 | Point 2 | |
|---|---|---|
| 335.21 | 334.00 | Inc Axis Location |
| 23.29 | 24.57 | Surface Location |
| 21.01 | 22.25 | Scan Axis Location |
| 13.19 | 13.40 | Metal Path |
| 118.4 | 120.3 | Time |
| 38 | 39 | % DAC |
| 12.99 | 13.20 | Depth In Material |
| | 1.26 | Separation |

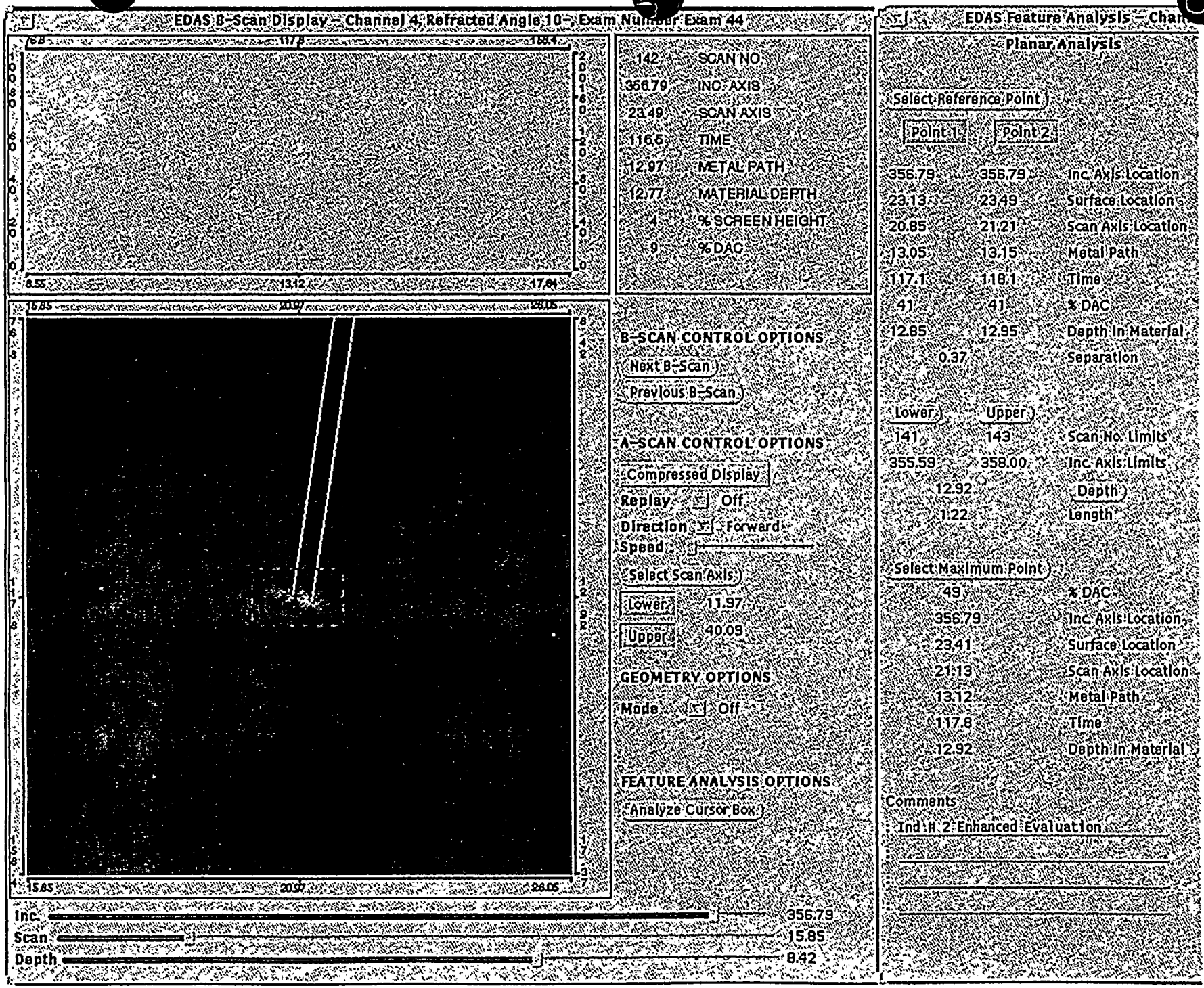
| Lower | Upper | |
|---|---|---|
| 122 | 126 | Scan No. Limits |
| 332.91 | 337.58 | Inc Axis Limits |
| | 13.17 | Depth |
| | 2.38 | Length |

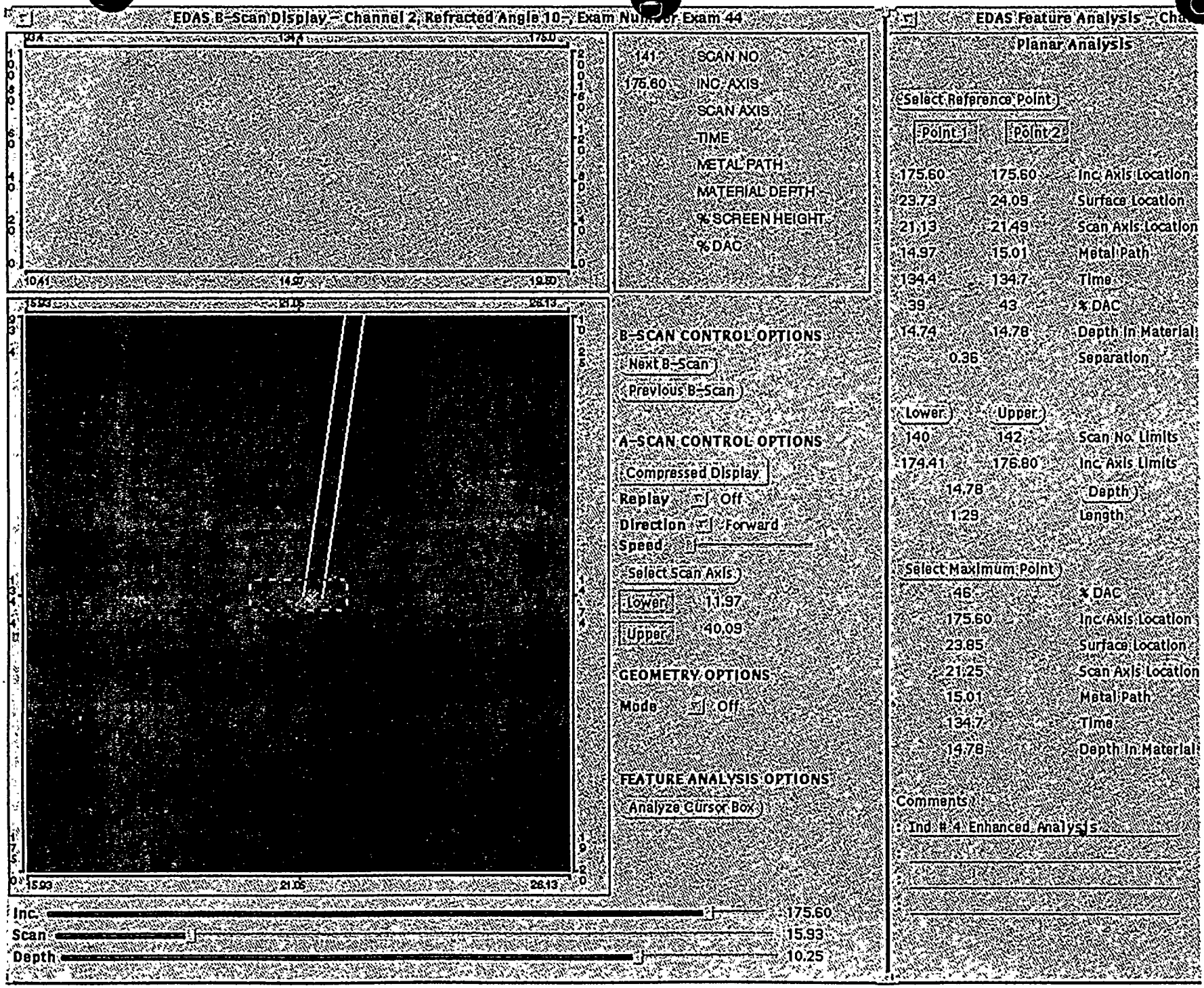
Select Maximum Point

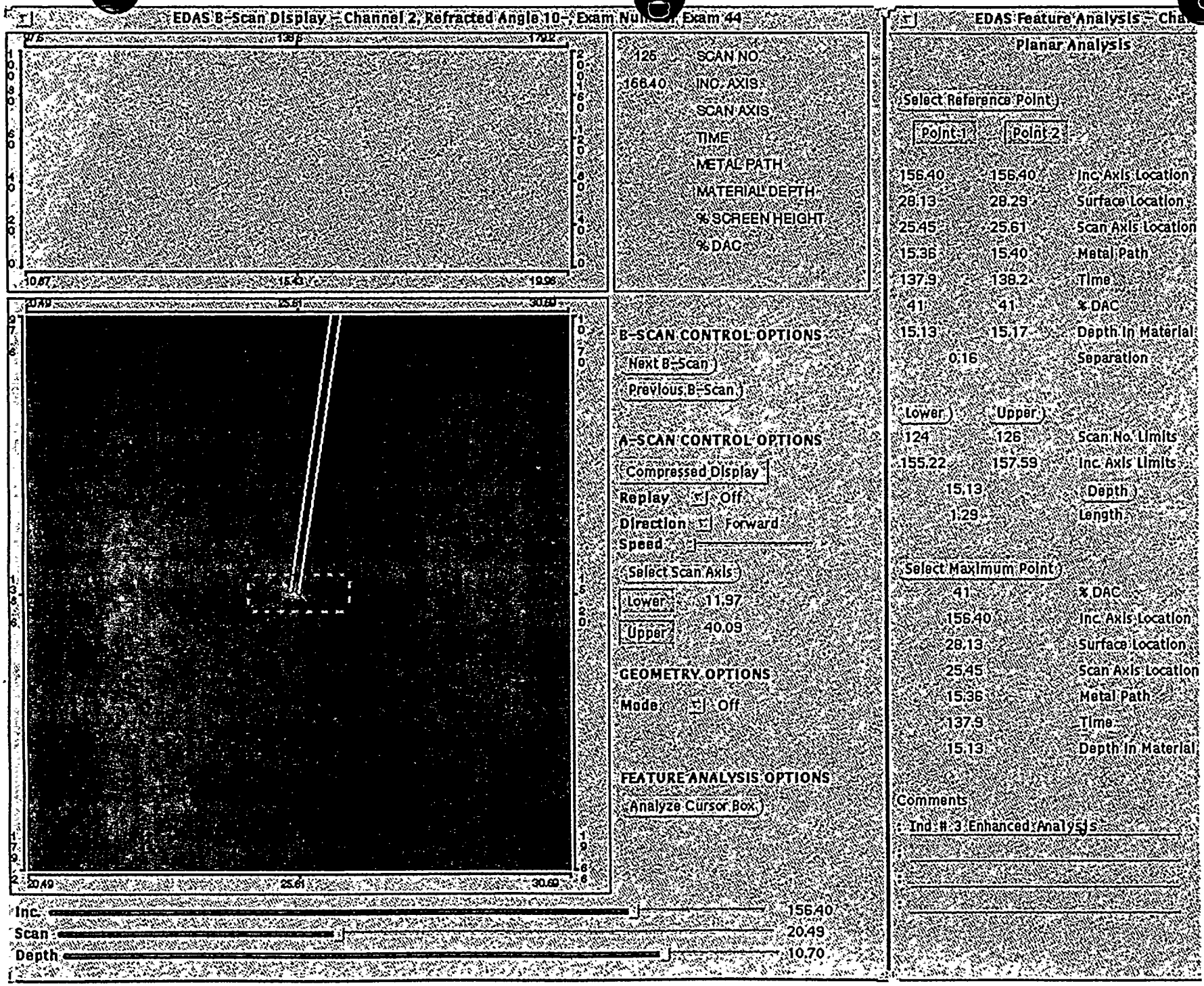
| | |
|---|---|
| 66 | % DAC |
| 334.00 | Inc Axis Location |
| 24.33 | Surface Location |
| 22.01 | Scan Axis Location |
| 13.37 | Metal Path |
| 120.0 | Time |
| 13.17 | Depth In Material |

Comments

Ind # 1 with Enhanced Evaluation


EDAS B-Scan Display - Channel 4, Refracted Angle 10 - Exam Number Exam 44
142 SCAN NO.
356.79 INC. AXIS
23.49 SCAN AXIS
116.6 TIME
12.97 METAL PATH
12.77 MATERIAL DEPTH
4 % SCREEN HEIGHT
9 % DAC
B-SCAN CONTROL OPTIONS
Next B-Scan
Previous B-Scan
A-SCAN CONTROL OPTIONS
Compressed Display
Replay Off
Direction Forward
Speed
Select Scan Axis
Lower 11.97
Upper 40.09
GEOMETRY OPTIONS
Mode Off
FEATURE ANALYSIS OPTIONS
Analyze Cursor Box
Inc.
Scan
Depth
356.79
15.85
8.42
EDAS Feature Analysis - Chan
Planar Analysis
Select Reference Point
Point 1
Point 2
356.79 356.79 Inc. Axis Location
23.13 23.49 Surface Location
20.85 21.21 Scan Axis Location
13.05 13.15 Metal Path
117.1 118.1 Time
41 41 % DAC
12.85 12.95 Depth In Material
0.37 Separation
Lower
Upper
141 143 Scan No. Limits
355.59 358.00 Inc. Axis Limits
12.92 Depth
1.22 Length
Select Maximum Point
49 % DAC
356.79 Inc. Axis Location
23.41 Surface Location
21.13 Scan Axis Location
13.12 Metal Path
117.8 Time
12.92 Depth In Material
Comments
Ind # 2 Enhanced Evaluation


EDAS B-Scan Display – Channel 2, Refracted Angle 10 –, Exam Number Exam 44
141 SCAN NO
176.60 INC. AXIS
SCAN AXIS
TIME
METAL PATH
MATERIAL DEPTH
% SCREEN HEIGHT
% DAC
B-SCAN CONTROL OPTIONS
Next B-Scan
Previous B-Scan
A-SCAN CONTROL OPTIONS
Compressed Display
Replay Off
Direction Forward
Speed
Select Scan Axis
Lower 11.97
Upper 40.09
GEOMETRY OPTIONS
Mode Off
FEATURE ANALYSIS OPTIONS
Analyze Cursor Box
Inc. 175.60
Scan 15.93
Depth 10.25
EDAS Feature Analysis – Cha
Planar Analysis
Select Reference Point
Point 1
Point 2
175.60 175.60 Inc Axis Location
29.73 24.09 Surface Location
21.13 21.49 Scan Axis Location
14.97 15.01 Metal Path
134.4 134.7 Time
39 43 % DAC
14.74 14.78 Depth In Material
0.36 Separation
Lower
Upper
140 142 Scan No. Limits
174.41 176.80 Inc Axis Limits
14.78 Depth
1.29 Length
Select Maximum Point
46 % DAC
175.60 Inc Axis Location
23.85 Surface Location
21.25 Scan Axis Location
15.01 Metal Path
134.7 Time
14.78 Depth In Material
Comments
Ind # 4 Enhanced Analysis


EDAS B-Scan Display - Channel 2, Refracted Angle 10 - , Exam Nu , Exam 44
125 SCAN NO
166.40 INC. AXIS
SCAN AXIS
TIME
METAL PATH
MATERIAL DEPTH
% SCREEN HEIGHT
% DAC
B-SCAN CONTROL OPTIONS
Next B-Scan
Previous B-Scan
A-SCAN CONTROL OPTIONS
Compressed Display
Replay Off
Direction Forward
Speed
Select Scan Axis
Lower 11.97
Upper 40.09
GEOMETRY OPTIONS
Mode Off
FEATURE ANALYSIS OPTIONS
Analyze Cursor Box
Inc. 156.40
Scan 20.49
Depth 10.70
EDAS Feature Analysis - Cha
Planar Analysis
Select Reference Point
Point 1
Point 2
156.40 156.40 Inc Axis Location
28.13 28.29 Surface Location
25.45 25.61 Scan Axis Location
15.36 15.40 Metal Path
137.9 138.2 Time
41 41 % DAC
15.13 15.17 Depth In Material
0.16 Separation
Lower
Upper
124 126 Scan No. Limits
155.22 157.59 Inc Axis Limits
15.13 Depth
1.29 Length
Select Maximum Point
41 % DAC
156.40 Inc Axis Location
28.13 Surface Location
25.45 Scan Axis Location
15.36 Metal Path
137.9 Time
15.13 Depth In Material
Comments
Ind. # 3 Enhanced Analysis

DC Cook Unit 2
2-N4-I
Inlet Noz. Bore @ 67 deg. Looking TWD

---

Cursor Box 1 of 2

| | |
|---|---|
| Scan Axis | 20.87 - 22.11 |
| Inc. Axis | 209.90 - 219.89 |
| Depth In Material | 4.01 - 5.12 |

Channel 1

Module Coordinates

| | |
|---|---|
| Inc. Axis | - |
| Scan Axis | 28.07 - 29.31 |

Channel 2

Module Coordinates

| | |
|---|---|
| Inc. Axis | - |
| Scan Axis | 24.51 - 25.75 |

Channel 3

Module Coordinates

| | |
|---|---|
| Inc. Axis | 32.71 - 42.72 |
| Scan Axis | 28.07 - 29.31 |

Channel 4

Module Coordinates

| | |
|---|---|
| Inc. Axis | 27.12 - 37.11 |
| Scan Axis | 24.51 - 25.75 |

Channel 4
Summary

Feature Analysis
Comments
: Enhanced Analysis 7/23/96
:
:
:

---

Cursor Box 2 of 2

| | |
|---|---|
| Scan Axis | 17.11 - 18.19 |
| Inc. Axis | 87.50 - 97.49 |
| Depth In Material | 15.62 - 16.05 |

Channel 1

Module Coordinates

| | |
|---|---|
| Inc. Axis | 90.42 - 100.43 |
| Scan Axis | 35.91 - 36.99 |

Channel 2

Module Coordinates

| | |
|---|---|
| Inc. Axis | 84.92 - 94.91 |
| Scan Axis | 21.95 - 23.03 |

Channel 2
Planar

Feature Analysis
Inc. Axis Values

| | | |
|---|---|---|
| Scan No. Limits | 77 | 79 |
| Inc. Axis Limits | 91.91 | 94.09 |
| Depth | 15.83 | |
| Length | 1.24 | |
| Maximum Point | | |
| % DAC | 44 | |
| Inc. Axis Location | 93.00 | |
| Surface Location | 19.23 | |
| Scan Axis Location | 17.55 | |
| Depth In Material | 15.83 | |
| Metal Path | 15.92 | |
| Time | 141.4 | |

Comments

: Indication #1
: Spot
:
:

Channel 3

Module Coordinates

| | |
|---|---|
| Inc. Axis | - |
| Scan Axis | 35.91 - 36.99 |

Channel 4

Module Coordinates

| | |
|---|---|
| Inc. Axis | - |
| Scan Axis | 21.95 - 23.03 |

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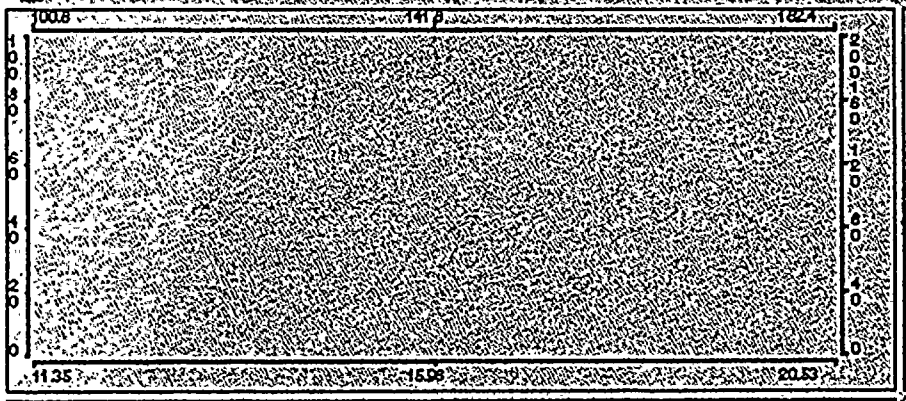
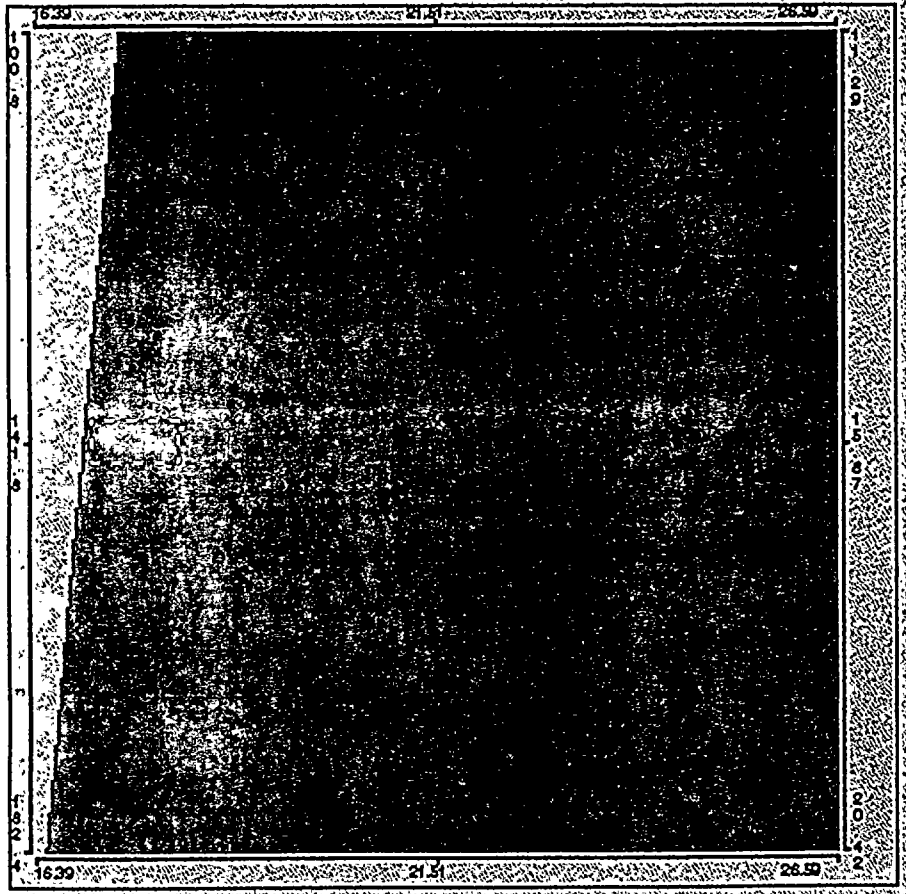
Reviewed By W. Clay SNT Level ~~III~~ Date 8/15/96

EDAS B-Scan Display – Channel 2, Refracted Angle 06 – Exam Nu… Exam48




| | |
|---|---|
| 78 | SCAN NO. |
| 93.00 | INC. AXIS |
| 26.47 | SCAN AXIS |
| 108.2 | TIME |
| 12.18 | METAL PATH |
| 12.11 | MATERIAL DEPTH |
| 8 | % SCREEN HEIGHT |
| 17 | % DAC |




B-SCAN CONTROL OPTIONS

Next B-Scan

Previous B-Scan

A-SCAN CONTROL OPTIONS

Compressed Display

Replay Off

Direction Forward

Speed

Select Scan Axis

Lower 16.39

Upper 41.23

GEOMETRY OPTIONS

Mode Off

FEATURE ANALYSIS OPTIONS

Analyze Cursor Box

Inc. 93.00

Scan 16.39

Depth 11.29

EDAS Feature Analysis – Cha…

Planar Analysis

Select Reference Point

Point 1 Point 2

| | |
|---|---|
| | Inc Axis Location |
| | Surface Location |
| | Scan Axis Location |
| | Metal Path |
| | Time |
| | % DAC |
| | Depth In Material |
| | Separation |

| Lower | Upper | |
|---|---|---|
| 77 | 79 | Scan No. Limits |
| 91.91 | 94.09 | Inc Axis Limits |
| 15.83 | | Depth |
| 1.24 | | Length |

Select Maximum Point

| | |
|---|---|
| 44 | % DAC |
| 93.00 | Inc Axis Location |
| 19.23 | Surface Location |
| 17.55 | Scan Axis Location |
| 15.92 | Metal Path |
| 141.4 | Time |
| 15.83 | Depth In Material |

Comments

Indication #1

Spot

DC Cook Unit 2
2-N4-I
Inlet Noz. Bore @ 67 deg. Looking TWD

---

Cursor Box 1 of 4

| | |
|---|---|
| Scan Axis | 20.87 - 22.11 |
| Inc. Axis | 315.35 - 325.34 |
| Depth In Material | 4.01 - 5.12 |

Channel 1

Module Coordinates

| | |
|---|---|
| Inc. Axis | - |
| Scan Axis | 28.07 - 29.31 |

Channel 2

Module Coordinates

| | |
|---|---|
| Inc. Axis | - |
| Scan Axis | 24.51 - 25.75 |

Channel 3

Module Coordinates

| | |
|---|---|
| Inc. Axis | 138.22 - 148.14 |
| Scan Axis | 28.07 - 29.31 |

Channel 4

Module Coordinates

| | |
|---|---|
| Inc. Axis | 132.62 - 142.62 |
| Scan Axis | 24.51 - 25.75 |

Channel 4
Summary

Feature Analysis
Comments
: Analysis performed after enhancement
:
:
:

---

| | |
|---|---|
| Cursor Box 2 of 4 | |
| Scan Axis | 21.43 - 23.11 |
| Inc. Axis | 294.26 - 304.25 |
| Depth In Material | 15.23 - 15.73 |

Channel 1

| | |
|---|---|
| Module Coordinates | |
| Inc. Axis | - |
| Scan Axis | 39.87 - 41.55 |

Channel 2

| | |
|---|---|
| Module Coordinates | |
| Inc. Axis | - |
| Scan Axis | 26.23 - 27.91 |

Channel 3

| | |
|---|---|
| Module Coordinates | |
| Inc. Axis | 117.13 - 127.11 |
| Scan Axis | 39.87 - 41.55 |

Channel 4

| | |
|---|---|
| Module Coordinates | |
| Inc. Axis | 111.52 - 121.53 |
| Scan Axis | 26.23 - 27.91 |

| | Channel 4 | |
|---|---|---|
| Feature Analysis | Planar | |
| Reference Points | | |
| Inc. Axis Location | 299.83 | 298.72 |
| Surface Location | 23.39 | 24.43 |
| Scan Axis Location | 21.75 | 22.79 |
| Depth In Material | 15.44 | 15.58 |
| Metal Path | 15.53 | 15.67 |
| Time | 137.9 | 139.2 |
| % DAC | 41 | 41 |
| Separation | 1.05 | |
| Inc. Axis Values | | |
| Scan No. Limits | 100 | 103 |
| Inc. Axis Limits | 297.52 | 300.92 |
| Depth | 15.44 | |
| Length | 1.90 | |
| Maximum Point | | |
| % DAC | 73 | |
| Inc. Axis Location | 299.83 | |
| Surface Location | 23.87 | |
| Scan Axis Location | 22.23 | |
| Depth In Material | 15.44 | |
| Metal Path | 15.53 | |
| Time | 137.9 | |

Comments

: Ind. # 2 Enhanced Analysis

:

---

Cursor Box 3 of 4

| | |
|---|---|
| Scan Axis | 18.27 - 20.43 |
| Inc. Axis | 113.03 - 123.02 |
| Depth In Material | 15.66 - 16.23 |

Channel 1

Module Coordinates

| | |
|---|---|
| Inc. Axis | 116.02 - 125.92 |
| Scan Axis | 37.11 - 39.27 |

Channel 2

Module Coordinates

| | |
|---|---|
| Inc. Axis | 110.41 - 120.41 |
| Scan Axis | 23.11 - 25.27 |

| Feature Analysis | Channel 2 Planar | |
|---|---|---|
| Reference Points | | |
| Inc. Axis Location | 116.30 | 116.30 |
| Surface Location | 20.35 | 21.71 |
| Scan Axis Location | 18.67 | 20.03 |
| Depth In Material | 15.90 | 15.94 |
| Metal Path | 15.99 | 16.03 |
| Time | 142.1 | 142.4 |
| % DAC | 51 | 49 |
| Separation | 1.36 | |
| Inc. Axis Values | | |
| Scan No. Limits | 97 | 100 |
| Inc. Axis Limits | 114.10 | 117.40 |
| Depth | 15.94 | |
| Length | 1.88 | |
| Maximum Point | | |
| % DAC | 101 | |
| Inc. Axis Location | 116.30 | |
| Surface Location | 21.31 | |
| Scan Axis Location | 19.63 | |
| Depth In Material | 15.94 | |
| Metal Path | 16.03 | |
| Time | 142.4 | |

Comments

: Ind #1 with Enhanced Analysis
: Depth sized @ 1/2 max
:
:

Channel 3

Module Coordinates
Inc. Axis -
Scan Axis 37.11 - 39.27

Channel 4

Module Coordinates
Inc. Axis -
Scan Axis 23.11 - 25.27

---

Cursor Box 4 of 4
Scan Axis 24.03 - 26.07
Inc. Axis 350.87 - 355.31
Depth In Material 15.19 - 15.76

Channel 1

Module Coordinates
Inc. Axis -
Scan Axis 42.43 - 44.47

Channel 2

Module Coordinates
Inc. Axis -
Scan Axis 28.83 - 30.87

Channel 3

Module Coordinates
Inc. Axis 173.71 - 178.12
Scan Axis 42.43 - 44.47

Channel 4

Module Coordinates
Inc. Axis 168.14 - 172.62
Scan Axis 28.83 - 30.87

| | Channel 4 | |
|---|---|---|
| Feature Analysis | Planar | |
| Reference Points | | |
| Inc. Axis Location | 353.03 | 351.92 |
| Surface Location | 25.95 | 27.31 |
| Scan Axis Location | 24.31 | 25.67 |
| Depth In Material | 15.44 | 15.65 |
| Metal Path | 15.53 | 15.74 |
| Time | 137.9 | 139.8 |
| % DAC | 38 | 38 |
| Separation | 1.38 | |
| Inc. Axis Values | | |
| Scan No. Limits | 148 | 152 |
| Inc. Axis Limits | 350.84 | 355.32 |
| Depth | 15.51 | |
| Length | 2.51 | |
| Maximum Point | | |
| % DAC | 51 | |
| Inc. Axis Location | 353.03 | |
| Surface Location | 26.51 | |
| Scan Axis Location | 24.87 | |
| Depth In Material | 15.51 | |
| Metal Path | 15.60 | |
| Time | 138.6 | |
| Comments | | |
| : | Ind # 3 Enhanced Analysis | |
| : | | |
| : | | |
| : | | |

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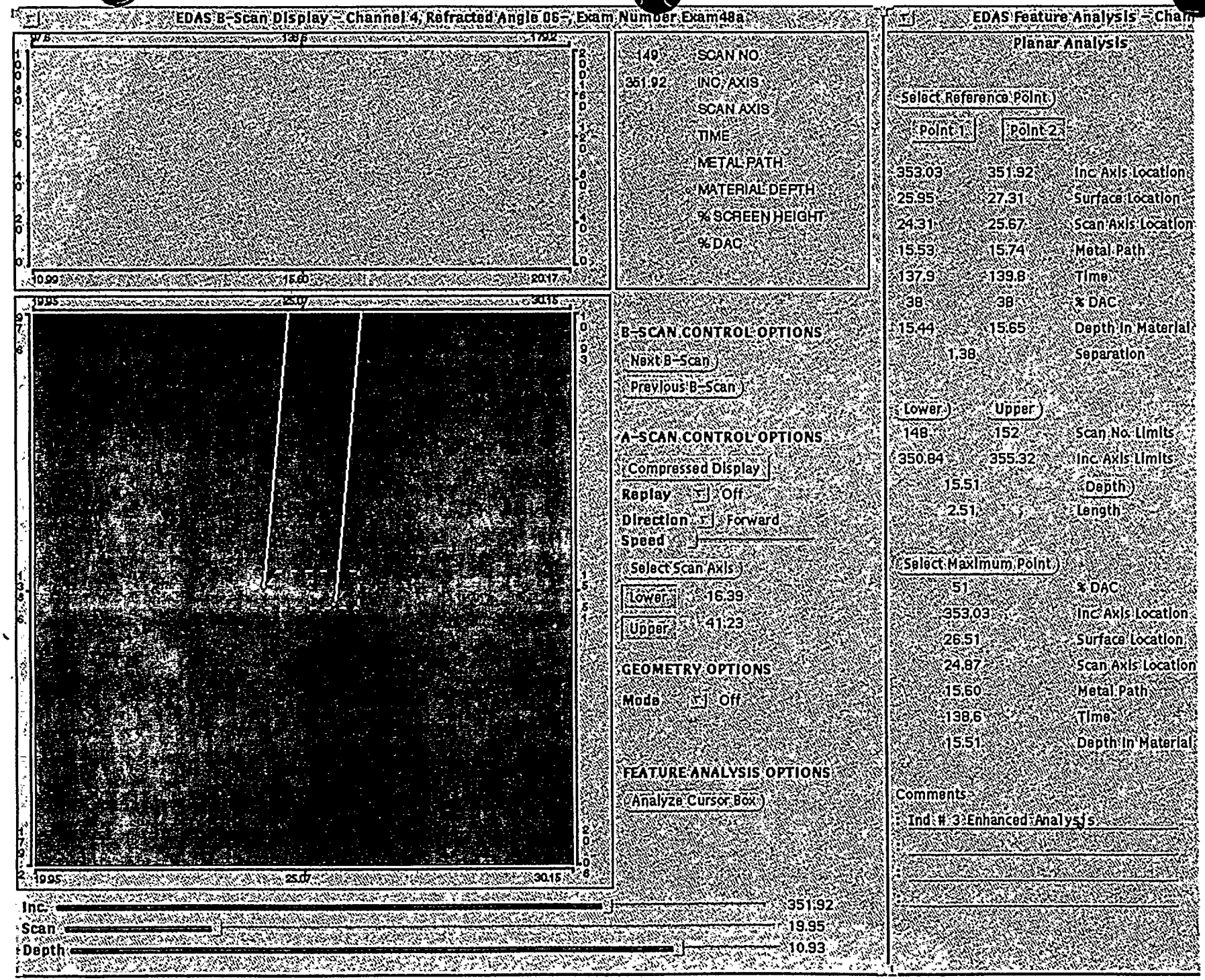
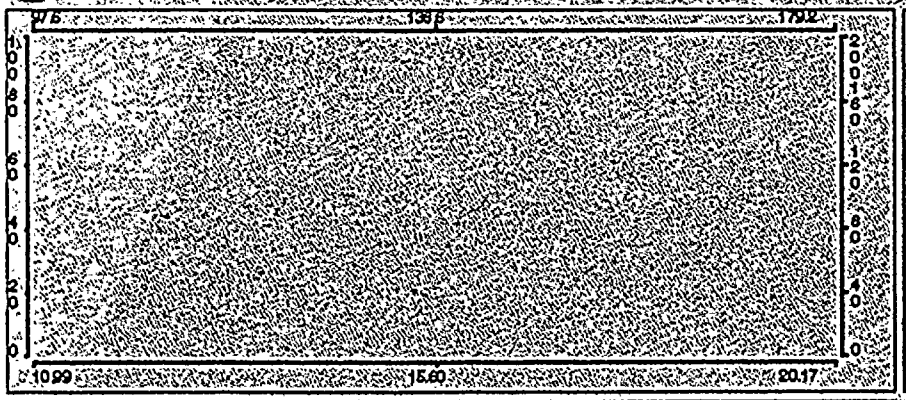
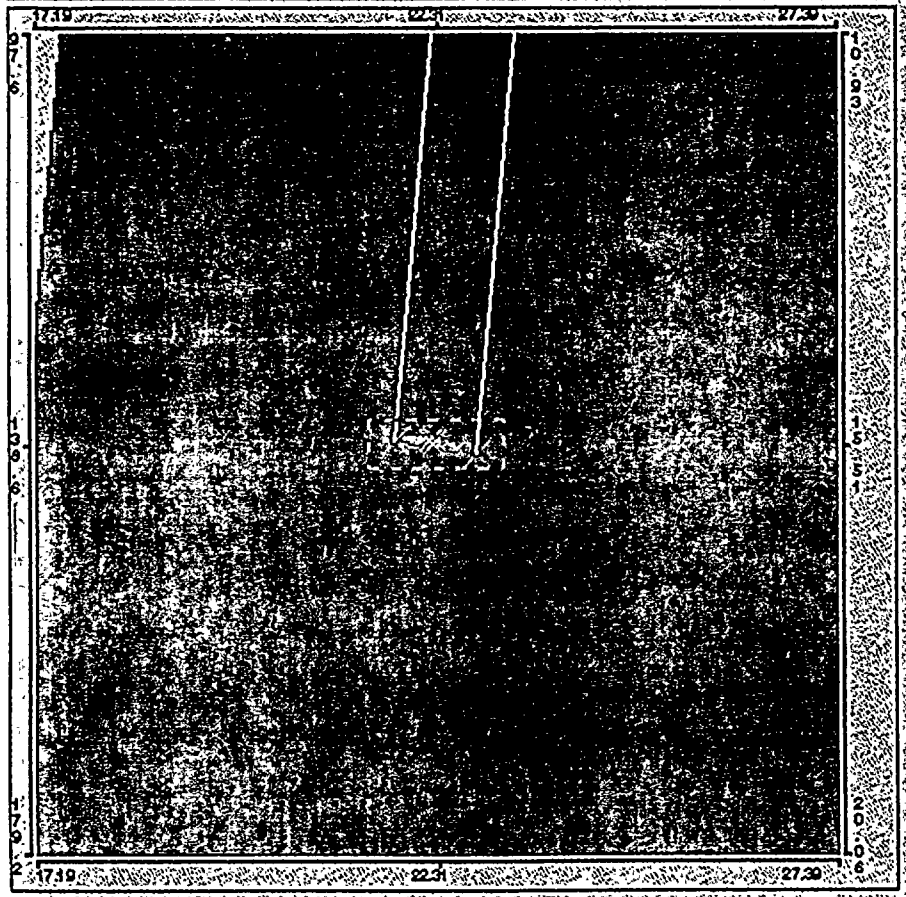
Reviewed By W. Clyde SNT Level III Date 8/6/96


EDAS B-Scan Display - Channel 4, Refracted Angle 05, Exam Number Exam48a
149 SCAN NO
351.92 INC AXIS
SCAN AXIS
TIME
METAL PATH
MATERIAL DEPTH
% SCREEN HEIGHT
% DAC
B-SCAN CONTROL OPTIONS
Next B-Scan
Previous B-Scan
A-SCAN CONTROL OPTIONS
Compressed Display
Replay Off
Direction Forward
Speed
Select Scan Axis
Lower 16.39
Upper 41.23
GEOMETRY OPTIONS
Mode Off
FEATURE ANALYSIS OPTIONS
Analyze Cursor Box
Inc. 351.92
Scan 19.95
Depth 10.93
EDAS Feature Analysis - Chan
Planar Analysis
Select Reference Point
Point 1
Point 2
353.03 351.92 Inc Axis Location
25.95 27.31 Surface Location
24.31 25.67 Scan Axis Location
15.53 15.74 Metal Path
137.9 139.8 Time
38 38 % DAC
15.44 15.65 Depth In Material
1.38 Separation
Lower
Upper
148 152 Scan No. Limits
350.84 355.32 Inc Axis Limits
15.51 Depth
2.51 Length
Select Maximum Point
51 % DAC
353.03 Inc Axis Location
26.51 Surface Location
24.87 Scan Axis Location
15.60 Metal Path
138.6 Time
15.51 Depth In Material
Comments
Ind # 3 Enhanced Analysis

EDAS B-Scan Display - Channel 4, Refracted Angle 06-, Exam Number Exam48a




102 SCAN NO.
299.83 INC. AXIS
SCAN AXIS
TIME
METAL PATH
MATERIAL DEPTH
% SCREEN HEIGHT
% DAC




B-SCAN CONTROL OPTIONS
Next B-Scan
Previous B-Scan

A-SCAN CONTROL OPTIONS
Compressed Display
Replay Off
Direction Forward
Speed
Select Scan Axis
Lower 16.39
Upper 41.23

GEOMETRY OPTIONS
Mode Off

FEATURE ANALYSIS OPTIONS
Analyze Cursor Box

Inc. 299.83
Scan 17.19
Depth 10.93

EDAS Feature Analysis - Chan 4

Planar Analysis

Select Reference Point

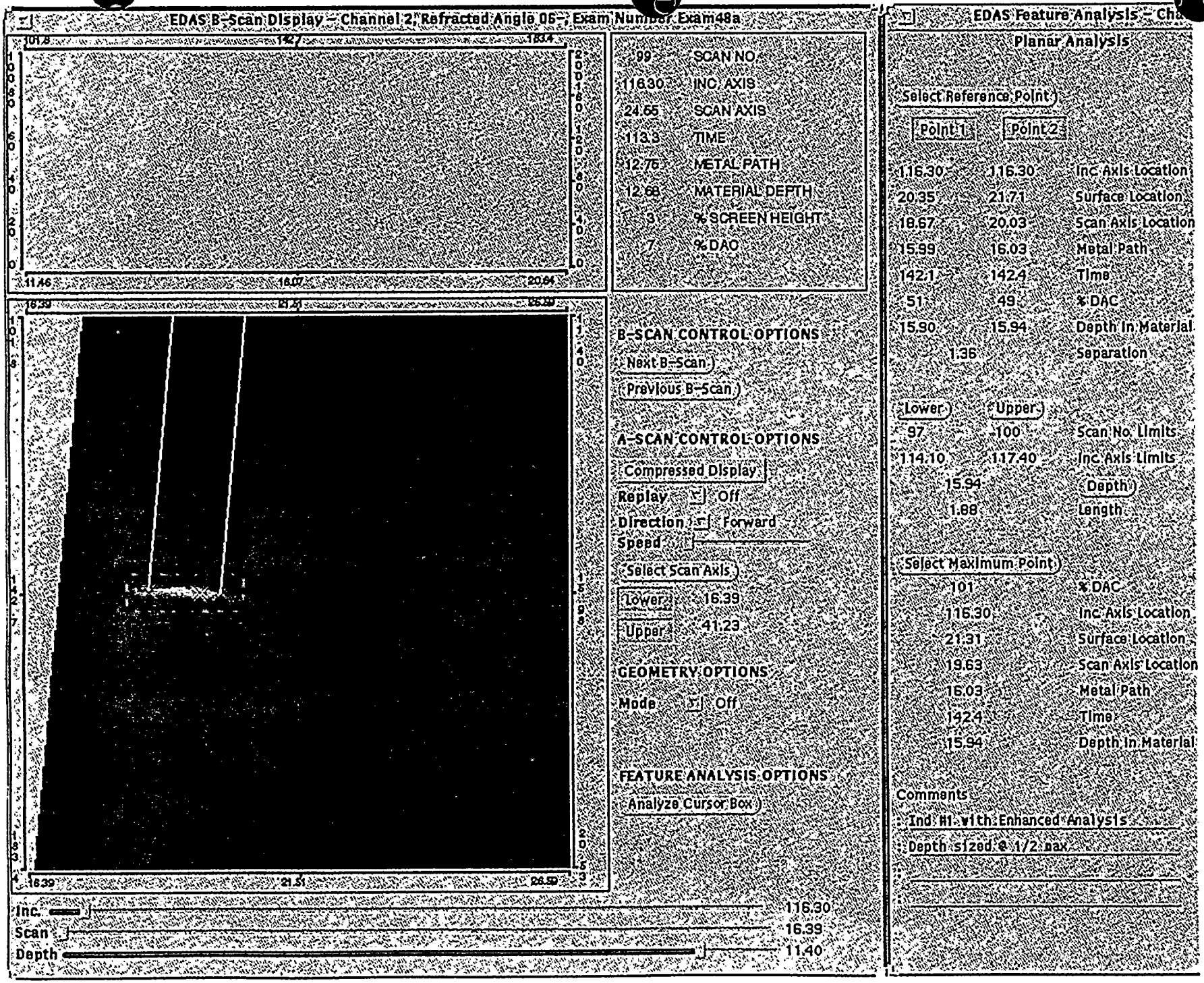
| Point 1 | Point 2 | |
|---|---|---|
| 299.83 | 298.72 | Inc. Axis Location |
| 23.39 | 24.43 | Surface Location |
| 21.75 | 22.79 | Scan Axis Location |
| 15.53 | 15.67 | Metal Path |
| 137.9 | 139.2 | Time |
| 41 | 41 | % DAC |
| 15.44 | 15.58 | Depth In Material |
| | 1.05 | Separation |

| Lower | Upper | |
|---|---|---|
| 100 | 103 | Scan No. Limits |
| 297.52 | 300.92 | Inc. Axis Limits |
| 15.44 | | Depth |
| 1.90 | | Length |

Select Maximum Point

| | |
|---|---|
| 73 | % DAC |
| 299.83 | Inc. Axis Location |
| 23.87 | Surface Location |
| 22.23 | Scan Axis Location |
| 15.53 | Metal Path |
| 137.9 | Time |
| 15.44 | Depth In Material |

Comments
Ind. # 2 Enhanced Analysis


EDAS B-Scan Display – Channel 2, Refracted Angle 05°, Exam Number Exam48a
99 SCAN NO.
116.30 INC. AXIS
24.65 SCAN AXIS
113.3 TIME
12.76 METAL PATH
12.68 MATERIAL DEPTH
3 % SCREEN HEIGHT
7 % DAC
B-SCAN CONTROL OPTIONS
Next B-Scan
Previous B-Scan
A-SCAN CONTROL OPTIONS
Compressed Display
Replay Off
Direction Forward
Speed
Select Scan Axis
Lower 16.39
Upper 41.23
GEOMETRY OPTIONS
Mode Off
FEATURE ANALYSIS OPTIONS
Analyze Cursor Box
Inc. 116.30
Scan 16.39
Depth 11.40
EDAS Feature Analysis – Cha
Planar Analysis
Select Reference Point
Point 1 Point 2
116.30 116.30 Inc Axis Location
20.35 21.71 Surface Location
18.67 20.03 Scan Axis Location
15.99 16.03 Metal Path
142.1 142.4 Time
51 49 % DAC
15.90 15.94 Depth In Material
1.36 Separation
Lower Upper
97 100 Scan No. Limits
114.10 117.40 Inc Axis Limits
15.94 Depth
1.88 Length
Select Maximum Point
101 % DAC
116.30 Inc Axis Location
21.31 Surface Location
19.63 Scan Axis Location
16.03 Metal Path
142.4 Time
15.94 Depth In Material
Comments
Ind #1 with Enhanced Analysis
Depth sized @ 1/2 max

DC Cook Unit 2
2-N3-I
Inlet Noz. Bore @ 113 deg. Looking TWD

---

Cursor Box 1 of 3

| | |
|---|---|
| Scan Axis | 20.87 - 22.11 |
| Inc. Axis | 209.90 - 219.89 |
| Depth In Material | 4.01 - 5.12 |

Channel 1

Module Coordinates

| | |
|---|---|
| Inc. Axis | - |
| Scan Axis | 28.07 - 29.31 |

Channel 2

Module Coordinates

| | |
|---|---|
| Inc. Axis | - |
| Scan Axis | 24.51 - 25.75 |

Channel 3

Module Coordinates

| | |
|---|---|
| Inc. Axis | 32.71 - 42.71 |
| Scan Axis | 28.07 - 29.31 |

Channel 4

Module Coordinates

| | |
|---|---|
| Inc. Axis | 27.13 - 37.14 |
| Scan Axis | 24.51 - 25.75 |

Channel 4
Summary

Feature Analysis
Comments
: Analysis performed with
: enhancement
:
:

---

| | | |
|---|---|---|
| Cursor Box 2 of 3 | | |
| Scan Axis | | 24.27 - 26.11 |
| Inc. Axis | | 169.64 - 179.63 |
| Depth In Material | | 16.48 - 16.95 |
| | | Channel 1 |
| Module Coordinates | | |
| Inc. Axis | | 172.62 - 182.62 |
| Scan Axis | | 43.95 - 45.79 |
| | | Channel 2 |
| Module Coordinates | | |
| Inc. Axis | | 167.02 - 177.03 |
| Scan Axis | | 29.19 - 31.03 |
| | | Channel 2 |
| Feature Analysis | | Planar |
| Inc. Axis Values | | |
| Scan No. Limits | 151 | 153 |
| Inc. Axis Limits | 174.09 | 176.29 |
| Depth | | 16.66 |
| Length | | 1.28 |
| Maximum Point | | |
| % DAC | | 44 |
| Inc. Axis Location | | 175.20 |
| Surface Location | | 26.63 |
| Scan Axis Location | | 24.87 |
| Depth In Material | | 16.66 |
| Metal Path | | 16.75 |
| Time | | 148.8 |
| Comments | | |
| : | Ind #2 - Spot | |
| : | | |
| : | | |
| : | | |
| | | Channel 3 |
| Module Coordinates | | |
| Inc. Axis | | - |
| Scan Axis | | 43.95 - 45.79 |
| | | Channel 4 |
| Module Coordinates | | |
| Inc. Axis | | - |
| Scan Axis | | 29.19 - 31.03 |

---

Cursor Box 3 of 3

| | |
|---|---|
| Scan Axis | 22.19 - 24.11 |
| Inc. Axis | 354.20 - 4.19 |
| Depth In Material | 15.05 - 15.48 |

Channel 1

Module Coordinates

| | |
|---|---|
| Inc. Axis | - |
| Scan Axis | 40.43 - 42.35 |

Channel 2

Module Coordinates

| | |
|---|---|
| Inc. Axis | - |
| Scan Axis | 26.99 - 28.91 |

Channel 3

Module Coordinates

| | |
|---|---|
| Inc. Axis | 177.03 - |
| Scan Axis | 40.43 - 42.35 |

Channel 4

Module Coordinates

| | |
|---|---|
| Inc. Axis | 171.51 - 181.42 |
| Scan Axis | 26.99 - 28.91 |

Channel 4

Feature Analysis Planar

Reference Points

| | | |
|---|---|---|
| Inc. Axis Location | 0.81 | 359.73 |
| Surface Location | 24.07 | 25.39 |
| Scan Axis Location | 22.47 | 23.79 |
| Depth In Material | 15.12 | 15.34 |
| Metal Path | 15.20 | 15.42 |
| Time | 135.0 | 137.0 |
| % DAC | 46 | 44 |
| Separation | 1.34 | |

Inc. Axis Values

| | | |
|---|---|---|
| Scan No. Limits | 155 | 159 |
| Inc. Axis Limits | 358.61 | 3.02 |
| Depth | 15.19 | |
| Length | 2.45 | |

Maximum Point

| | |
|---|---|
| % DAC | 70 |
| Inc. Axis Location | 0.81 |
| Surface Location | 24.83 |
| Scan Axis Location | 23.23 |
| Depth In Material | 15.19 |

| | | |
|---|---|---|
| Metal Path | | 15.27 |
| Time | | 135.7 |
| Comments | | |
| : | Ind #1 | |
| : | | |
| : | | |
| : | | |

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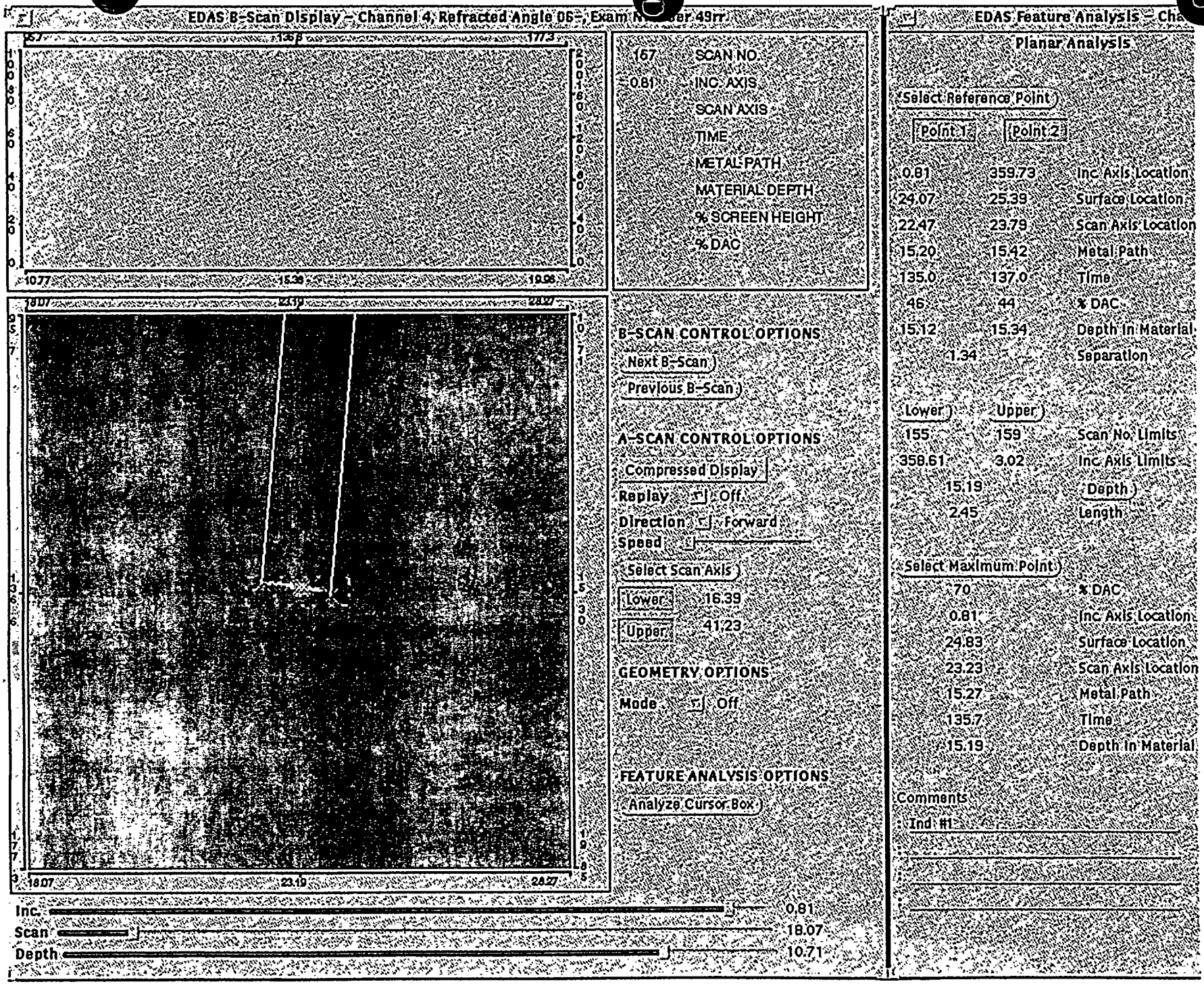
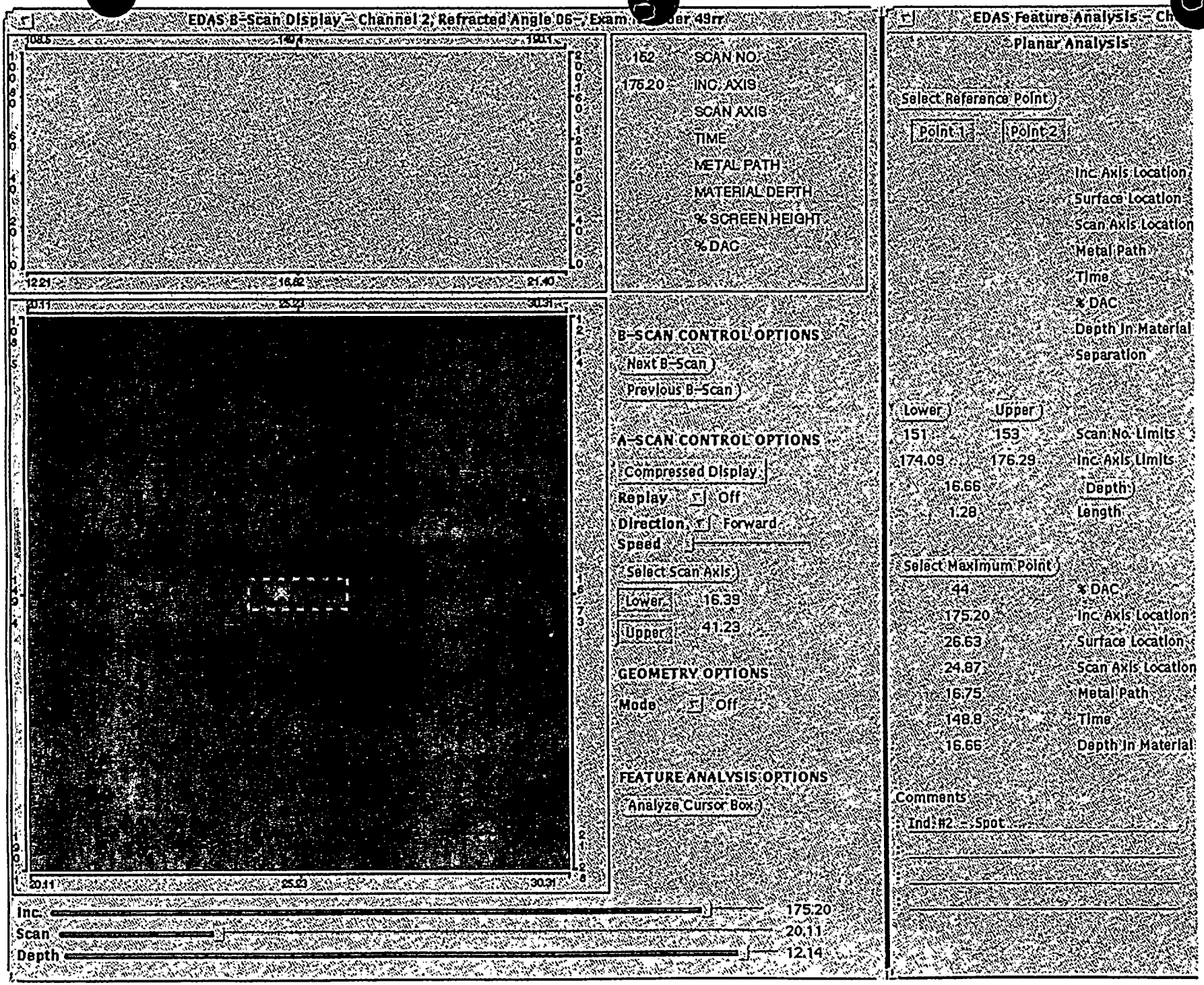
Reviewed By W. Clayton SNT Level III Date 8/15/94


EDAS B-Scan Display – Channel 4, Refracted Angle 06 –, Exam
EDAS Feature Analysis – Cha
Planar Analysis
Select Reference Point
Point 1
Point 2
0.81 359.73 Inc Axis Location
24.07 25.39 Surface Location
22.47 23.79 Scan Axis Location
15.20 15.42 Metal Path
135.0 137.0 Time
46 44 % DAC
15.12 15.34 Depth In Material
1.34 Separation
Lower
Upper
155 159 Scan No Limits
358.61 3.02 Inc Axis Limits
15.19 Depth
2.45 Length
Select Maximum Point
70 % DAC
0.81 Inc Axis Location
24.83 Surface Location
23.23 Scan Axis Location
15.27 Metal Path
135.7 Time
15.19 Depth In Material
Comments
Ind #1
167 SCAN NO
0.81 INC AXIS
SCAN AXIS
TIME
METAL PATH
MATERIAL DEPTH
% SCREEN HEIGHT
% DAC
B-SCAN CONTROL OPTIONS
Next B-Scan
Previous B-Scan
A-SCAN CONTROL OPTIONS
Compressed Display
Replay Off
Direction Forward
Speed
Select Scan Axis
Lower 16.39
Upper 41.23
GEOMETRY OPTIONS
Mode Off
FEATURE ANALYSIS OPTIONS
Analyze Cursor Box
Inc. 0.81
Scan 18.07
Depth 10.71


EDAS B-Scan Display – Channel 2, Refracted Angle 06 – Exam
EDAS Feature Analysis – Ch
Planar Analysis
SCAN NO.
INC. AXIS
SCAN AXIS
TIME
METAL PATH
MATERIAL DEPTH
% SCREEN HEIGHT
% DAC
B-SCAN CONTROL OPTIONS
Next B-Scan
Previous B-Scan
A-SCAN CONTROL OPTIONS
Compressed Display
Replay
Off
Direction
Forward
Speed
Select Scan Axis
Lower
Upper
GEOMETRY OPTIONS
Mode
Off
FEATURE ANALYSIS OPTIONS
Analyze Cursor Box
Inc.
Scan
Depth
Select Reference Point
Point 1
Point 2
Inc. Axis Location
Surface Location
Scan Axis Location
Metal Path
Time
% DAC
Depth In Material
Separation
Lower
Upper
Scan No. Limits
Inc. Axis Limits
Depth
Length
Select Maximum Point
% DAC
Inc. Axis Location
Surface Location
Scan Axis Location
Metal Path
Time
Depth In Material
Comments
Ind. #2 – Spot

DC Cook Unit 2
2-N2-I
Inlet Noz. Bore @ 247 deg. Looking TWD

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Cursor Box 1 of 1

| | |
|---|---|
| Scan Axis | 19.47 - 21.67 |
| Inc. Axis | 290.93 - 295.37 |
| Depth In Material | 15.66 - 16.26 |

Channel 1

Module Coordinates

| | |
|---|---|
| Inc. Axis | - |
| Scan Axis | 38.31 - 40.51 |

Channel 2

Module Coordinates

| | |
|---|---|
| Inc. Axis | - |
| Scan Axis | 24.31 - 26.51 |

Channel 3

Module Coordinates

| | |
|---|---|
| Inc. Axis | 113.72 - 118.22 |
| Scan Axis | 38.31 - 40.51 |

Channel 4

Module Coordinates

| | |
|---|---|
| Inc. Axis | 108.23 - 112.63 |
| Scan Axis | 24.31 - 26.51 |

Channel 4
Planar

Feature Analysis
Reference Points

| | | |
|---|---|---|
| Inc. Axis Location | 293.13 | 293.13 |
| Surface Location | 21.39 | 22.91 |
| Scan Axis Location | 19.71 | 21.23 |
| Depth In Material | 15.87 | 16.08 |
| Metal Path | 15.96 | 16.17 |
| Time | 141.8 | 143.7 |
| % DAC | 56 | 55 |
| Separation | 1.53 | |

Inc. Axis Values

| | | |
|---|---|---|
| Scan No. Limits | 93 | 99 |
| Inc. Axis Limits | 289.82 | 296.42 |
| Depth | 15.94 | |
| Length | 3.75 | |

Maximum Point

| | |
|---|---|
| % DAC | 109 |
| Inc. Axis Location | 293.13 |

| | |
|---|---|
| Surface Location | 21.99 |
| Scan Axis Location | 20.31 |
| Depth In Material | 15.94 |
| Metal Path | 16.03 |
| Time | 142.4 |

Comments

: Ind # 1 Enhanced Evaluation 7/26/96
: Length = 50% DAC Depth = 1/2 max
:
:

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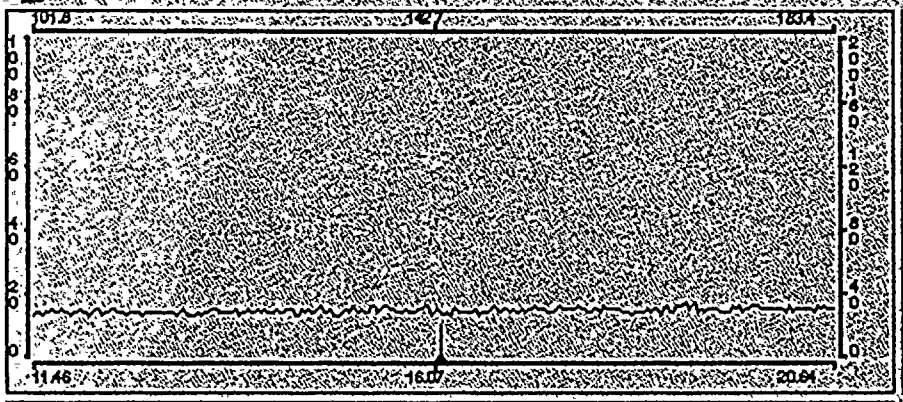
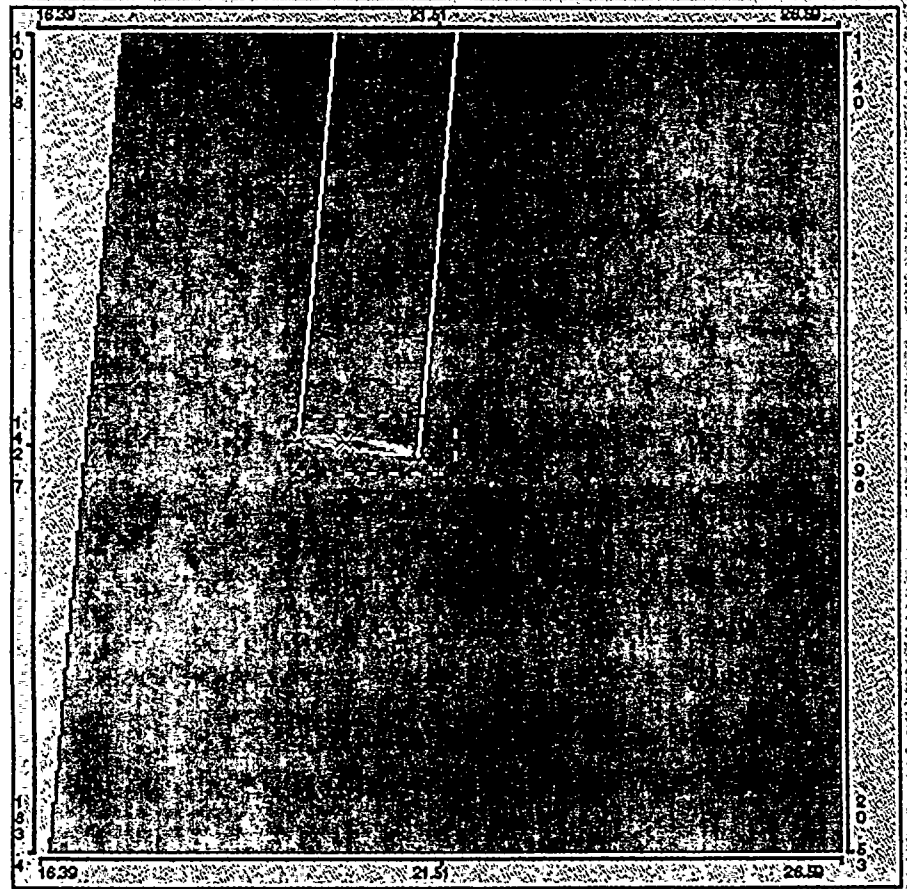
Reviewed By W. Clay SNT Level III Date 8/5/96

EDAS B-Scan Display – Channel 4, Refracted Angle 0b – Exam Nu… Exam50rr



| | |
|---|---|
| 96 | SCAN NO |
| 293.13 | INC AXIS |
| 26.69 | SCAN AXIS |
| 143.4 | TIME |
| 16.14 | METAL PATH |
| 16.05 | MATERIAL DEPTH |
| 14 | % SCREEN HEIGHT |
| 29 | % DAC |



B-SCAN CONTROL OPTIONS

Next B-Scan

Previous B-Scan

A-SCAN CONTROL OPTIONS

Compressed Display

Replay Off

Direction Forward

Speed

Select Scan Axis

Lower 16.39

Upper 41.23

GEOMETRY OPTIONS

Mode Off

FEATURE ANALYSIS OPTIONS

Analyze Cursor Box

Inc 293.13

Scan 16.39

Depth 11.40

EDAS Feature Analysis – Ch…

Planar Analysis

Select Reference Point

| Point 1 | Point 2 | |
|---|---|---|
| 293.13 | 293.13 | Inc Axis Location |
| 21.39 | 22.91 | Surface Location |
| 19.71 | 21.23 | Scan Axis Location |
| 15.96 | 16.17 | Metal Path |
| 141.8 | 143.7 | Time |
| 56 | 55 | % DAC |
| 15.87 | 16.08 | Depth In Material |
| 1.53 | | Separation |

| Lower | Upper | |
|---|---|---|
| 93 | 99 | Scan No Limits |
| 289.82 | 296.42 | Inc Axis Limits |
| 15.94 | | Depth |
| 3.75 | | Length |

Select Maximum Point

| | |
|---|---|
| 109 | % DAC |
| 293.13 | Inc Axis Location |
| 21.99 | Surface Location |
| 20.31 | Scan Axis Location |
| 16.03 | Metal Path |
| 142.4 | Time |
| 15.94 | Depth In Material |

Comments

Ind # 1 Enhanced Evaluation 7/26/96

Length = 50% DAC Depth = 1/2 max