F00305

NOAA FORM 76-35A

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE

DESCRIPTIVE REPORT

Type of Survey Side Scan Sonar

Field No. R/H-20-01-87

Registry No. F00305

LOCALITY

State Maryland

General Locality Chesapeake Bay

Sublocality Kent Point to Thomas Point Shoal

1987

CHIEF OF PARTY
LCDR A.D. Anderson

LIBRARY & ARCHIVES

DATE November 29, 1988

DIAGRAM 77-4

Charts

12270
12263
12260

NOAA FORM 77-28 (11-72)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

HYDROGRAPHIC TITLE SHEET

REGISTER NO. FE-305 55

FIELD NO. RU-20-01-87

INSTRUCTIONS - The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

State: Maryland

General locality: ~~Upper~~ Chesapeake Bay

Locality: ~~Off Thomas Point~~ Kent Point to Thomas Point Shoal

Scale: 1:20,000 Date of survey: 4/28/87 - 9/14/87

Instructions dated: December 19, 1986 Project No.: OPR-E609-RU/HE-87

Vessel: NOAA Ship RUDE S-590 (9040)

Chief of party: LCDR Alan D. Anderson

Surveyed by: LCDR A.D. Anderson, LT J.F. Novaro, K.F. Sharack, ENS T.R. Waddington

Soundings taken by echo sounder, hand lead, pole: Pneumatic Depth Gauge

Graphic record scaled by: ADA, JFN, KFS, TRW, MAS

Graphic record checked by: ADA, JFN, KFS, TRW, MAS

Protracted by: N/A Automated plot by: Brunig-Nicolet (Field Plots) ZETA 824A CS Plotter

Verification by: Hydrographic Surveys Branch, Atlantic Marine Center

Soundings in ~~fathoms~~ feet at ~~MLW~~ MLLW corrected for ~~predicted~~ smooth tides

REMARKS:

ALW015 / SURF ✓ 5/31/89 SJV

NOAA FORM 77-28 SUPERSEDES FORM C&GS-537.

☆ U.S. G.P.O. 1972-769-565/519 REG. #6

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* = Data removed from the original Descriptive Report and filed with the field records.

DESCRIPTIVE REPORT TO ACCOMPANY
SURVEY FE-30555
RU-20-1-87
Scale 1:20,000
NOAA Ship RUDE (S590)
LCDR Alan D. Anderson, Commanding

A. PROJECT DESCRIPTION

This survey was conducted in accordance with Hydrographic Project Instructions OPR-E60987-RU/HE87, Chesapeake Bay, Maryland and Virginia, dated December 19, 1986 as amended by Change No. 1, dated January 29, 1987; Change No. 2, Dated July 20, 1987; and Change No. 3, dated August 24, 1987.

The purpose of this project was to verify or disprove the existence of charted submerged wrecks and obstructions that pose a danger to navigation in the vicinity of the planned Baltimore Harbor and Channels 50-foot dredging project.

The survey involved Side Scan Sonar (SSS) investigations utilizing a EG&G Model 260 slant range corrected Side Scan Sonar and a Model 272, 100/500 khz Side Scan towfish. Side Scan sonification was supplemented by echo-soundings that were obtained from the ship's Raytheon DSF6000N echo-sounder. Least depths on targets that were found by diver investigation, were taken with a calibrated pneumofathometer. - *See section 4.c. of the Evaluation Report.*

B. PROJECT OVERVIEW

During the course of this project the RUDE and HECK were responsible for both implementing and assisting in the testing of the recently developed Hydrographic Data Acquisition System (HDAS). Although HDAS provided many benefits over the Hydroplot system (e.g., greatly increased data collection capabilities, better interface with various peripheral units, and improved plotting capabilities), the RUDE experienced many of the problems typically encountered when implementing any new system. As HDAS software was being continually modified during this project, the RUDE was often called upon to assist in testing these modifications as well as to evaluate the different versions of the Survey and Post-Processing programs. The RUDE did not have any post-processing capabilities until late July. Even then, the HDAS post-processing software only afforded the vessel the limited ability to dead reckon through positioning busts.

Towards the end of this project period, we began to understand the capabilities and limitations of HDAS and how we could work with the system to meet the project requirements. We began to store data for

each AWOIS item on a unique tape and then used the HDAS swath plot option to help illustrate the proof of side scan coverage.

Some of the raw digital data which had been collected early in the project had been over written while on-line or lost, due to the inability of the system to retrieve the information from the raw data tapes. In the side scan survey of AWOIS 4458 for example, the digital data for the entire first 200% coverage of the search area was lost. Yet, in this and other minor instances where data was lost on the tape, we had relied on the raw data records and the original field sheet to verify the required coverage. - See sections 4.d. & 7.a.2) of the Evaluation Report.

Early in the project we encountered problems in the water column with thermoclines affecting the effective range of our side scan trace. MARTEK casts were taken frequently during this time period in order to determine the depth of the thermocline. This allowed us to fly the side scan towfish below the thermocline, but conversely, this also forced us to reduce our side scan range. On several occasions we had to reduce our range scale down to 50 meters; this is particularly evident on AWOIS 4459 where we were forced to run lines only 30 meters apart in order to obtain the required coverage. All coverage losses due to thermoclines were noted on the side scan traces and are reflected in the post-processing swath plots. We narrowed the swath plot ranges to reflect the actual usable swath ranges. - See also section 4.b. of the Evaluation Report.

As the project progressed into the summer and the water temperature became fairly uniform throughout, the thermocline problems began to disappear. However, we then began to experience problems with large schools of fish in the water column. The dense schools of fish would block the DSF6000N beam, and cause the side scan to actually lose bottom tracking and instead, track the school of fish. This affect was recorded in our data and on our swath plots, as the side scan height appeared to fall below the minimum height needed to obtain the full effective range. (Side scan height must be at least 8% of the range scale.) Yet during many of these instances, we had a readable side scan trace for the full range, while our on-line swath plot showed only limited coverage due to an HDAS feature which adjusts the swath range based upon side scan height. In these cases, the HDAS system software allowed us to over-ride the on-line swath plot range with the effective range when replotting the data during post-processing. On a few occasions the schools of fish became so thick that side scan operations had to be cancelled for that day on one item and moved to another item in a different area. This problem was very localized and most noticeable on the relatively shallow water items, mainly AWOIS 4459 and AWOIS 4460. - See also section 4.b. of the Evaluation Report.

C. AREA SURVEYED

The NOAA Ship RUDE were issued an AWOIS Listing on January 12, 1987. Subsequent versions of the original AWOIS Listing were dated May 20, 1987 and May 29, 1987. The requirements cited in the AWOIS Listing dated May 29, 1987 have been included below. Please note the split

requirements allowing two distinct search radii for each 200% coverage on AWOIS Items 4458, 4460 and 4461 as outlined in the May 29 version.

The following AWOIS investigations are included in this report:

AWOIS NO.	PRIORITY NUMBER	CHARTED POSITION	REQUIRED SEARCH RADIUS	REQUIRED COVERAGE
4457	8	38/5~~5/59.2~~ 3 35.0 N 76/25/03.0 W	1000 meters	400%
4458	3	38/52/41.0 N 76/24/05.0 W	1000 meters 750 meters	200% 200%
4459	9	38/52/33.0 N 76/24/48.0 W	1000 meters	400%
4460	10	38/51/32.0 N 76/25/23.0 W	1000 meters 750 meters	200% 200%
4461	4	38/50/00.0 N 76/24/00.0 W	1000 meters 750 meters	200% 200%

D. SURVEY VESSELS

The following vessels were used during the project:

VESSEL	ELECTRONIC DATA PROCESSING NUMBER	PRIMARY FUNCTION
NOAA Ship RUDE (S590)	9040	Side Scan Operations
RUDE Launch (RU3)		Diving Operations
RUDE Skiff (RU1)		Mini-Ranger Service and Diving Operations

E. SOUNDING EQUIPMENT

E1. Raytheon DSF-6000N

Echo soundings were taken utilizing a Raytheon DSF-6000N Echo-Sounder. The unit was calibrated periodically using an Electronic Depth Simulator Instrument (EDSI) provided by AMC/EEB. DSF-6000N data was collected throughout the project; however this data should be considered for reconnaissance purposes only and was intended strictly for use when attempting to precisely locate a target. It is not now possible to apply tide and velocity corrections to these soundings using HDAS. Sounding plots for this data were not required.

See also sections 1.b. & 3. of the Evaluation Report.

E2. EG&G Model 260 Side Scan Sonar

Side Scan coverage was accomplished using an EG&G Model 260 Slant Range Corrected Side Scan Sonar unit with a Model 272, 100/500 khz Towfish. Periodic "rub tests" were performed on the towfish. Our confidence in the proper functioning of the EG&G system was assured as the quality of the image displayed on the recorder was critically evaluated before every operation. On July 16, 1987 we began to notice vertical striations on our side scan traces which made the sonargram less readable. The recording unit was diagnosed as functioning improperly and was returned to AMC on July 17, 1987. From there it was forwarded to EG&G in Massachusetts for repairs. While in Annapolis on August 7, the EG&G recording unit was returned, and was tested satisfactorily on August 10. Although the unit was gone for three weeks, only two (2) days of project time were lost as two of those weeks were dedicated to the Bathyscan 300 test project.

E3. Pneumofathometer Gauge

Least depths for diver investigated contacts were determined using a pneumofathometer gauge as described in Hydrographic Survey Guideline No. 55. Strong currents and winds in the dive area sometimes made calibrations difficult to perform, however no unusual problems were encountered when obtaining the least depths. Pneumofathometer calibration information is provided in Appendix II. See section 4.c. of the Evaluation Report.

F. CORRECTIONS TO ECHO SOUNDINGS

F1. Velocity Corrections

Velocity correction data was obtained through periodic MARTEK CTD casts taken in the survey area. MARTEK casts were taken weekly, and more frequently as water conditions appeared to be affecting our side scan and fathometer traces. Depending on the survey area, we took both shallow and deep-water MARTEK casts. Because of limitations in HDAS software, velocity corrections were not able to be applied to the sounding data of this survey. However, velocity corrections were calculated for all MARTEK casts by using the velocity computation package developed for our IBM PC. The MARTEK casts have been included in Appendix VII. The Martek calibration data is not available at this time. Given that velocity corrections were not applied, the calibrations were not necessary to the project.

F2. Tide Corrections

The operating station at Baltimore, Md. was the reference station used when determining predicted tides for various sites within the project area. Due to limitations in HDAS software, predicted tidal correctors were not able to be applied to the on-line sounding data compiled throughout the project. Tidal Zoning Correctors were applied to the predicted tides at Baltimore, Md. to compute the Least Depths which were obtained using the pneumofathometer. A request for smooth tides

was made to N\OMA12 on September 25. The Tide Note,Request for Smooth Tides, and predicted tide printouts are included in Appendix I.

The field Tidal Zone Correctors were applied to the individual AWOIS Items as follows:

Item Number	Tidal Zone Correctors High Water	Low Water	Height Ratio
4457 A	-2 HR 12 MIN	-2 HR 24 MIN	0.90
4457 B	-2 HR 12 MIN	-2 HR 24 MIN	0.90
4457 C	-2 HR 12 MIN	-2 HR 24 MIN	0.90
4458 A	-2 HR 12 MIN	-2 HR 24 MIN	0.90
4459 C	-2 HR 12 MIN	-2 HR 24 MIN	0.90
4459 D	-2 HR 12 MIN	-2 HR 24 MIN	0.90
4459 F	-2 HR 43 MIN	-2 HR 47 MIN	0.99
4459 G	-2 HR 12 MIN	-2 HR 24 MIN	0.90
4460 A	-2 HR 43 MIN	-2 HR 47 MIN	0.99
4460 B	-2 HR 43 MIN	-2 HR 47 MIN	0.99
4461 A	-2 HR 43 MIN	-2 HR 47 MIN	0.99

F3. Settlement and Squat

Because the depths recorded in this survey were collected solely for reconnaissance purposes, no settlement and squat corrections were applied to the raw depth data. The static draft of the NOAA Ship RUDE for the Raytheon DSF-6000N transducer is 6.8 feet.

F4. Heave, Roll, Pitch

Heave, roll and pitch were measured by the Datawell B.V. Sensor mounted on the centerline of the ship, amidships, located in the forward stores area on B-Deck. The HDAS software is expected to apply the Heave corrections when sounding data is required. As soundings were not plotted for the side scan work, this feature was not used for the submitted plots. It is not apparent that the heave information is being recorded on the tape at this point. The Heave Pitch and Roll sensor is commonly referred to as the "HIPPY".

G. ELECTRONIC POSITIONING SYSTEMS

Positioning information for this survey was provided by the Motorola Mini-Ranger Falcon 484 microwave positioning system. Four control stations were established which provided a good line of position geometry throughout the survey. With the exception of a major interference area which was evident on the eastern portions of the AWOIS 4457 survey area, there were no significant positioning problems experienced in this survey. Even in this location where interference

was encountered, we were able to dead reckon our positions across this relatively small area. In other numerous areas, classical phase cancellation interference was encountered causing the loss of one or more LOP's from the HDAS Least Square solution. An algorithm incorporated into the HDAS software selectively evaluated all four incoming LOPs along with the heading of the vessel, and used only that data which appeared to be accurate. The Minimum Accepted Signal Strengths (MASS) were predetermined and supplied to the HDAS Program in the C-O tables. Any LOP received by HDAS below the programmed MASS would be disregarded and not applied to the positioning algorithm. This greatly reduced the effect of occasional "flyers" and the associated position busts.

All of the Motorola Mini-Ranger Falcon 484 codes were calibrated with each of the two Receiver / Transmitter units and with each of the two Range Processing Units to assure the accuracy that was required for the survey. The dates for this calibration were: April 2, 1987, calibrated at Fentress Air Station in Norfolk; April 29, 1987, June 15, 1987 and August 11, 1987, all calibrated at Annapolis, Md.

On September 17, 1987 two Mini Rangers were calibrated with both R/T's and both RPU's on the RUDE while in Annapolis, Md. These two Mini-Ranger units were returned to the RUDE after being recently repaired at AMC. The Baseline Calibration Information can be found in Appendix VII.

Weekly critical system checks were computed using the standard three point sextant fix to four known visible landmarks in the survey area. The angles derived from the three point sextant fix were then entered into the HDAS Computer for comparison to the ranges received by the Mini-Ranger system. All of the weekly critical systems checks were within the tolerances specified for a survey of this scale. The HDAS computations of the critical calculations can be found in Appendix XIII.

Non critical systems checks were performed using an HDAS baseline crossing calibration program to derive the computed versus the observed baseline distances. All of these systems checks were within the tolerances set for a survey of this scale. The HDAS Computer print-outs for the daily systems checks have been included in Appendix XIII.

H. SURVEY SHEETS

All survey sheets were produced aboard the NOAA Ship RUDE using the HDAS Computer and the Bruning-Nicolet ZETA 824A CS Plotter. Each sheet was plotted on the Modified Transverse Mercator Projection. Field sheets, track plots and swath plots were plotted at a scale of 1:10000 for ease of on-line observations and plotting. Because of the close proximity of these five items a contact sheet was plotted at a scale of 1:20000 showing all contacts that were deemed significant for investigation. In addition, for each of the AWOIS items covered, we have included the on-line swath or track plots, post-processing track

plots (200% coverage per plot) and post-processing swath plots (100% coverage per plot). Refer to Appendix V for the parameters of the AWOIS plotting sheets.

I. HORIZONTAL POSITION CONTROL

The horizontal datum for this project was the North American Datum of 1983. Geodetic support to establish hydrographic control in the Upper Chesapeake Bay area was provided by N/MOA2222. This field work was conducted in accordance with the Project Instructions for Job HC8704, dated 29 January 1987.

Listings of the control stations used during this project under the NAD 27 and NAD 83 were provided to the RUDE by N/CG241 prior to the start of the project. The control station list is provided in Appendix III along with a control station reference list that was generated to aid in the correlation of station names, numbers, and positions. The source for the positions used to control the work on these items was the NGS database listing provided through N/CG241.

Two electronic stations had to be mounted eccentrically from lighthouse positions requiring eccentic computations to be performed. Those stations were Thomas Point Lighthouse and Bloody Point Lighthouse. The computations are located in appendix III.
See section 4.e. of the Evaluation Report.

The HDAS system requires that positions of control stations be entered in plane coordinates. At first, those plane coordinates were generated using a program written aboard for the IBM PC; the HDAS utility software was not yet ready at the time that those computations were needed. The HDAS utility program was later completed using the same algorithm as the IBM PC program yeilding the same results.

J. AUTOMATED DATA PROCESSING

J1. Overview

All data collected during this survey was processed using HDAS. A general description of the steps involved in the data processing sequence is discussed below. In addition, we also present any unique problems which we encountered while working on a particular AWOIS item.

When running survey operations on-line, all data was stored on a raw data tape. Concurrently, we were also acquiring side-scan and echosounder traces, an on-line plot of our survey, and a raw data listing of all selected soundings by survey line along with associated data (see raw data listing). At the completion of a day's work, we scanned all side-scan and echosounder traces identifying potential targets and noting any coverage deficiencies, and we manually summarized the data collected in a Daily Data Abstract and a Position Processing Abstract. These abstracts evolved during the course of

this project are included in appendices VI through X. They represent our attempts to best track the data collected.

The Daily Data Abstract summarizes the entire day's work in a single line entry. In instances where multiple tapes were used in a single day there will be multiple entries. The Position Processing Abstracts are grouped by AWOIS item and are a line by line summary of the survey run for that item. In addition to the date and day of year, this abstract includes the reference line run, the raw Data Set Numbers (DSNs) for that line, the fix numbers for that line, the processed DSNs for that line (if it was not rejected), and any remarks about that line. Currently, the only way to access data through HDAS is via the DSN. Additionally, the DSN for a data record changes as it passes through the various data processing stages. This makes accurate tracking of the DSNs very important.

In order to begin post-processing the raw data, we had to transfer the data from the raw data tape onto the hard disk. The HDAS system hard disc is an HP 9133H 20 Megabyte disk drive. The system also includes a three and one half inch floppy drive. Since we had no capability to delete data which we wished to reject, we copied only good or "editable" data onto the hard disk. Also, because we had to be on-line in order to obtain a fix, all of our detached position (DP) data is imbedded within recon lines run over targets; we did not transfer this data onto the hard disk. We then obtained a hard disk catalog which listed all the data currently stored on the hard disk along with the renumbered DSNs. We then performed any edits necessary, which at this time consists only of our ability to hard smooth over any positioning busts. Basically, a hard smooth consists of dead-reckoning between two good fixes over any major positioning busts. These edits were noted on the hard disk catalog (by DSN), the raw data printouts (by selected sounding), and on the post-processing trackplots.

After editing, we then smooth plotted the data as required. In order to illustrate our side-scan coverage, we produced multiple 100% swathplots for all areas surveyed. In instances where the on-line sequential survey lines were run to provide 200% coverage, we smooth plotted every other line on the same sheet to produce the desired 100% swathplot. Using an HDAS feature, we were able to vary the effective swath range within plots. For each line that was smooth plotted, we have listed the effective swath range for that line in the left hand column of the Position Processing Abstract. We derived this effective swath range by examining the side-scan traces and determining the minimum swath range for each line. We feel that the multiple swathplots, when viewed collectively, provide an accurate picture of the side-scan coverage obtained around each AWOIS item.

After the data on hard disk was edited and plotted, it was then transferred back to a tape which became the edited data tape. Because only one tape file could be stored on the hard disk at a time, it was necessary to perform multiple iterations of the data transfer process when raw data for an AWOIS item was stored on multiple tapes. In these cases we appeared to lose the last fix from the previous edit,

when transferring additional data onto the edited tape. These instances are noted under the data processing descriptions for each item. After all edited data had been transferred onto the edited data tape, we obtained a data list of that tape. Although we attempted to list the data by selected soundings, this was not possible for all items. Using this data list, we then went back to the Position Processing Abstract and entered the processed DSNs for all data which was stored on the edited tape. (Data which was rejected does not have processed DSNs.)

Finally, we loaded the entire edited tape onto the hard disk and obtained a hard disk catalog of this information; this provided a line by line summary of all the data stored on the tape. For unknown reasons, the hard disk catalog and the data list for the same tape did not always agree. In some instances whole survey lines were missing from the hard disk catalog though they appeared on the data list; these lines are noted on the line by line summary for each tape. In other cases there are minor discrepancies between fix numbers, although the DSNs appear to agree; these instances are not highlighted. The following section discusses the results of the edited data lists and presents any other data processing irregularities associated with each of the AWOIS items.

J2. AWOIS 4457

In the northern portion of this survey area, we encountered a significant mini-ranger interference area which greatly affected our positioning accuracy. This area is very evident on the on-line survey plot. Although the positioning busts occurred close to the survey border, we did have adequate beginning and ending positions to enable us to hard smooth through the area.

Raw data for this item was stored on Tapes A, B, and C, and all DSNs which were hard smoothed are noted on the hard disk catalogs for these tapes. All edited data was transferred to Tape 4457. We were unable to obtain a data list by selected sounding for this tape, although all data appears to be on the tape. We did obtain a data list by fix number, and have noted the following discrepancies:

1) Ref Line -400: Fix 609 is missing (DSNs 378-3818);
2) Ref Line 1000: Fix 841 is missing (DSNs 14102-14138);
3) Ref Line 150: Duplicated at end of tape, DSNs 14142-14562 are not needed.

J3. AWOIS 4458

This area was initially surveyed in May based upon a 400% coverage requirement at 750m; however, none of this data was recoverable from the raw data tape. The sonargrams, the data printouts and the on-line swathplot from this survey have been submitted in order to verify this initial coverage. The item was resurveyed in August and we ran both north/south and east/west lines to provide 200% coverage to 1000m; no significant problems were encountered during the August survey. All raw data from the later survey was stored on Tape H and all edited

data was successfully transferred to Tape 4458. We were able to obtain a complete data list by selected sounding for this tape; no discrepancies were noted.

J4. AWOIS 4459

The eastern portion of this survey area overlapped with the survey area for AWOIS 4458. This enabled us to eliminate the overlapping area from our 200% north/south coverage. We did however, survey the entire area during our east/west coverage, resulting in more than 400% coverage in the overlapping area. During the north/south coverage for this item we encountered significant thermocline problems which greatly reduced our effective side-scan range and forced us to run tightly spaced survey lines. During the east/west coverage the thermocline problem had abated and we were able to obtain a 100m side-scan range.

Raw data for AWOIS 4459 was stored on Tapes D and F. When post-processing Tape D, we were unable to retrieve Ref lines 0, -250, -350, and -400 from the tape. These lines are included on the on-line plot and all the raw data is available, however we were unable to include these lines on the smooth plots or the edited tape. Because of this, there appear to be coverage deficiencies in the north/south post-processing swathplots. All edited data was transferred to Tape 4459. We were able to obtain a data list by selected sounding for this tape, and have noted the following descrepancy:

1) Ref Line -500: Fix 1203 is missing (DSNs 11583-11598).

J5. AWOIS 4460

This area was initially surveyed based upon a 400% coverage requirement at 750m. Because of this, the north/south lines which were run in May provide almost 300% coverage, though only to a 750m radius. The east/west lines which were run in August, provide 100% coverage at a 1000m radius.

Raw data for the north/south coverage was stored on Tape A. Two of the lines on this tape were edited, and the DSNs which were hard smoothed are noted on the hard disk catalog for Tape A. Raw data for the east/west coverage was stored on Tape G; no significant problems were encountered with the data on this tape. All edited data was transferred to Tape 4460. We were unable to obtain a data list by selected sounding for this tape, although all data appears to be on the tape. We did obtain a data list by fix, and have noted the following descrepancy:

1) Ref Line 2140: Fix 2315 is missing (DSNs 14657-14684).

J6. AWOIS 4461

This area was also initially surveyed based upon a 400% coverage requirement at 750m. As with AWOIS 4460, the north/south lines which were run in May provide over 200% coverage to a 750m radius. In

August this area was resurveyed and we ran both north/south and east/west lines to provide 200% coverage to a 1000m radius. Because of rapid shoaling near Bloody Point Bar Light, we had to limit the eastern portion of our survey area; this shoaling affected both the north/south and east/west coverage.

Raw data for the initial north/south coverage was stored on Tape A. Raw data for the later coverage was stored on Tape E; one of the lines on this tape was edited, and the DSNs which were hard smoothed are noted on the hard disk catalog for Tape E. All edited data was transferred onto Tape 4461. We were unable to obtain a data list by selected sounding for this tape, although all data appears to be on the tape. We did obtain a data list by fix, and have noted the following discrepancies:

1) Ref Line 550: Fix 313 is missing (DSNs 4907-4947);
2) Ref Line 2160: Fix 2504 is missing (DSNs 12784-12884).

K. AWOIS ITEM INVESTIGATION REPORTS

See section 7.a.1) of the Evaluation Report.

AWOIS ITEM NUMBER: 4457

I. Area of Investigation

(a) State / County: Maryland / Anne Arundel

(b) Sublocality: Thomas Point Shoal Lt.

(c) Method of Positioning: Falcon Mini-Ranger

II. Description

AWOIS Item number 4457 was reported to be a 24 ft. sailboat which sunk at position 38° 53' 35.00" N, 076° 25' 03.00" W. The survey required verification and least depth if found, or disproval through 400% side scan sonar investigation with a 1000 meter minimum search radius.

III. Procedures

Main Scheme Side Scan operations were conducted on May 22, 1987 (DOY: 142), May 27 (DOY: 147), June 2 (DOY: 153), June 3 (DOY: 154) and June 4 (DOY: 155). During these dates, 200% side scan coverage was developed and from the collected data, three (3) significant items were identified for further diving investigation. These targets were referred to as Targets 4457 A, 4457 B and 4457 C. Diving operations were conducted on these targets, with the results documented below.

IV. Target Investigations

TARGET: 4457 A (pos # 1447)

(a) DIVE SUMMARY: On July 20, 1987 (DOY: 201), the RUDE positioned itself directly over the target using the DSF-6000 and the Falcon Mini-Rangers, deployed a marker buoy and moved away. Diving operations were begun. The divers descended along the buoy line to the weight and proceeded to do a 20 m circle search until discovering the wreck. The buoy line was then moved to the center of the wreck and tied onto a broken mast extending from the target. A Least Depth and a Detached Position were taken on the target.

(b) DESCRIPTION OF TARGET FOUND: Target 4457 A was found to be a 24 foot-long sailboat, measured bow to stern. The boat's mast was metallic and broken at the lower section; the sail was still attached to the mast. The divers determined the broken mast to be the high point, and took the Least Depth on the remains of the mast. The high point extended 6 feet above the bottom in 39 feet of water. The vessel had no name on its transom and no identifying numbers present on either its sail or bow.

(c) RECOMMENDATIONS: Target 4457 A is considered to be the item 4457 as described in the AWOIS listing. The Hydrographer in Charge

recommends that the wreck be charted at the prescribed position using symbol No. 15, located in Section "O", page 13 of NOAA Chart No.1 (Eighth Edition, Printed: November 1984). Symbol No. 15 should be a sounding over a wreck with ~~no~~ a **danger curve** circumscribed about the Least Depth. The wreck is ~~not~~ considered a hazard to navigation. The standard wreck symbol should not be used, as the symbol would unnecessarily alarm the user's of NOAA charts. - See section 7.a.1) of the Evaluation Report.

(d) LEAST DEPTH:
Taken by pneumofathometer on July 20, 1987 (DOY: 201)

1) TIME: 1341(L) 1741(Z) LEAST DEPTH READING (FT): 36.4
2) TIME: 1341(L) 1741(Z) LEAST DEPTH READING (FT): 36.4
3) TIME: 1341(L) 1741(Z) LEAST DEPTH READING (FT): 36.4

AVERAGE LEAST DEPTH (FT) : 36.4

AVERAGE PNEUMO DEPTH (FT) : 36.4
PNEUMO GAGE CORRECTOR (FT) : +0.6
Smooth ~~PREDICTED~~ TIDAL ZONE COR (FT) : ~~-0.8~~ -1.2
TRANSDUCER DRAFT (FT) : 0.0
35.8 → 36 Wk plotted

ACTUAL LEAST DEPTH (FT) : ~~36.2~~

(e) DETACHED POSITIONS OF TARGET AND FIX NUMBERS:

1) HDAS FIX NO: 1 E: 23742.3 N: 136384.1
2) HDAS FIX NO: 1447 E: 23745.6 N: 136389.9 ← pos # used
3) HDAS FIX NO: 1452 E: 23745.0 N: 136390.4

AVERAGE DP: E: 23744.3 N: 136388.1

CALCULATED GP: Lat: 38° 53' 40.~~727~~3" N
Long: 076° 25' 04.50~~4~~" W

(f) LORAN C RATES:

	1)	2)	3)	4)
X	27578.6	27578.6	27578.6	27578.6
Y	42645.6	42645.6	42645.6	42645.6
Z	58944.6	58944.6	58944.7	58944.6

TARGET: 4457 B (pos #1454)

(a) DIVE SUMMARY: On July 21, 1987 (DOY: 202), the RUDE positioned itself directly over the target using the DSF-6000 and the Falcon Mini-Rangers, deployed a marker buoy and moved away. Diving operations were begun. The divers descended along the buoy line to the weight and proceeded to do a 20 m circle search and bumped into the target. The buoy line was then moved to the high point of the target and tied off. An additional 10 meter circle search was performed about the target but no other debris was found. No Least Depth was taken, yet a Detached Position was determined.

(b) DESCRIPTION OF TARGET FOUND: Target 4457 B was found was a 9 meter long oak tree trunk. The tree trunk was broken at both ends; no roots nor branches were apparent. The tree was lying approximately 3 feet off the bottom in 37 feet of water.- Charted depths are 43-46 feet.

(c) RECOMMENDATIONS: The Hydrographer in Charge recommends that Target 4457 B be added to the AWOIS listing at the prescribed position for a period of time not to exceed five (5) years, as Target 4457 B will deteriorate in short order. The target should not be charted as it poses no hazard to navigation. Target 4457 B is not located in close proximity to deep draft vessel traffic.- See section 7.a.1)a) of the Evaluation Report.

(d) DETACHED POSITIONS OF TARGET AND FIX NUMBERS:

1) HDAS FIX NO: 1453 E: 23680.4 N: 135927.8
2) HDAS FIX NO: 1454 E: 23679.9 N: 135936.0 ← pos # used
3) HDAS FIX NO: 1455 E: 23677.0 N: 135935.7

AVERAGE DP: E: 23679.1 N: 135933.2

CALCULATED GP: Lat: 38° 53' 25.965" N
Long: 076° 25' 07.123" W

E. LORAN C RATES:

	1)	2)	3)	4)
W	16113.0	16113.0	16112.7	16112.9
X	27578.0	27578.1	27578.1	27578.1
Y	42642.7	42642.6	42642.6	42642.6
Z	58943.3	58943.3	58943.3	58943.3

TARGET: 4457 C (pos # 1476)

(a) DIVE SUMMARY: On July 21, 1987 (DOY: 202), the RUDE positioned itself directly over the target using the DSF-6000 and the Falcon Mini-Rangers, deployed a marker buoy and moved away. Diving operations were begun. The divers descended along the buoy line to the weight and proceeded to do a 20 m circle search. The tag line hung on a piece of wood which protruded approximately 3 foot above the bottom. The wood was discovered to be attached to the target, which was partially buried in the silt. The buoy line was moved to the target and tied onto the protruding piece of wood. A Least Depth and a Detached Position were taken on the target.

(b) DESCRIPTION OF TARGET FOUND: Target 4457 C was found was to be a wooden sailboat partially buried in the silt. A length of 4 meters was measured along the exposed hull before the silt covered too much of the vessel. The sailboat was resting upright on its keel in 39 feet of water with only a portion of the hull exposed above the silt. The bow section extended about 2 feet above the bottom, while the stern section was buried in more than a foot of silt. The exposed portion of the sailboat was painted a red color and did not appear to be damaged, but was in a moderate state of deterioration. The description of this target somewhat matches the description of AWOIS

Charted depths are 41-46 feet.

Item 4459 which lies nearby. Due to the sparse information available, the determination that Target 4457 C is actually AWOIS Item 4459 could not be made with a high degree of certainty. AWOIS Item 4459 was not found.

(c) RECOMMENDATIONS: The Hydrographer in Charge recommends that Target 4457 C be added to the AWOIS listing at the prescribed position but should not be charted as it poses no hazard to navigation. Target 4457 C is not located in close proximity to deep draft vessel traffic and will deteriorate completely or be entirely buried in time. Do not Concur
See section 7.a. 1)b) of the Evaluation Report.

(d) LEAST DEPTH:
Taken by pnemofathometer on July 21, 1987 (DOY: 202)

1) TIME: 1528(L); 1928(Z) LEAST DEPTH READING (FT): 37.4
2) TIME: 1528(L); 1928(Z) LEAST DEPTH READING (FT): 37.4
3) TIME: 1528(L); 1928(Z) LEAST DEPTH READING (FT): 37.4

AVERAGE LEAST DEPTH (FT): 37.4

AVERAGE PNEUMO DEPTH (FT) : 37.4
PNEUMO GAGE CORRECTOR (FT) : +0.6
Smooth ~~PREDICTED~~ TIDAL ZONE COR (FT) : ~~-0.7~~ -0.8
TRANSDUCER DRAFT (FT) : 0.0
37.2
ACTUAL LEAST DEPTH (FT) : ~~36.3~~

(e) DETACHED POSITIONS OF CONTACT AND FIX NUMBERS:

1) HDAS FIX NO: 1459 N: 22845.2 E: 135838.6
2) HDAS FIX NO: 1476 N: 22847.6 E: 135926.5 ← pos # used
3) HDAS FIX NO: 1479 N: 22847.6 E: 135920.3

AVERAGE DP: N: 22846.8 E: 135928.5

CALCULATED GP: Lat: 38° 53' 25.6~~88~~9" N
Long: 076° 25' 41.6~~57~~6" W

(f) LORAN C RATES:

	1)	2)	3)	4)
w	16114.4	16115.2	16114.9	16114.9
x	27580.6	27580.7	27580.5	27580.6
y	42642.0	42642.0	42641.6	42641.9
z	58940.6	58940.6	58940.5	58940.6

V. AWOIS ITEM 4457 SUMMARY

AWOIS Item 4457 was covered 200% by side scan sonar for a minimum search radius of 1000 meters in accordance with established C&GS Side Scan Procedures. The three (3) targets that were determined to be significant from the first 200% side scan coverage were investigated

by divers. Target 4457 A was found in the search area and is considered to be AWOIS Item 4457. AWOIS 4457 should be charted for Target 4457 A, according to the recommendations made. Targets 4457 B and 4457 C should be added to the AWOIS Listing but not charted. - Do not concur

See section 7.a.1) of the Evaluation Report.

See section 7.a.2) of the Evaluation Report.

AWOIS ITEM NUMBER: 4458

I. Area of Investigation

(a) State / County: Maryland / Anne Arundel

(b) Sublocality: Thomas Point Shoal Lt.

(c) Method of Positioning: Falcon Mini-Ranger

II. Description

AWOIS Item number 4458 was reported to be a 28 ft. cabin cruiser, a nondangerous wreck, which had sunk in 100 feet of water at position 38° 52' 41.00" N, 076° 24' 05.00" W. The survey required verification and least depth if found, or disproval through 200% side scan sonar investigation with a 750 meter minimum search radius and an additional 200% side scan sonar investigation with a 1000 meter minimum search radius.

III. Procedures

Initial Main Scheme Side Scan operations began on May 18, 1987 (DOY: 138), and a minimum of 200% coverage to a 750 meter search radius was surveyed. The EG&G side scan and the DSF-6000 records were compiled, but the raw digital data from this first 200% coverage was unrecoverable on the HDAS System. Main Scheme Side Scan operations began anew on August 17 (DOY: 229) and August 18 (DOY: 230). During August, the second 200% side scan coverage to a 1000 meter minimum radius was developed. Based on the data collected for the full 400% coverage of the survey area, one (1) significant item was identified for further diving investigation. This particular target was discovered while off-line, well outside of the survey area. This target was referred to as Target 4458 A. Diving operations were conducted on this target, with the results documented below.

See section 4.d. of the Evaluation Report.

IV. Target Investigations

TARGET: 4458 A (pos # 1106)

(a) DIVE SUMMARY: On September 14, 1987 (DOY: 257), the RUDE positioned itself directly over the target using the DSF-6000 and the Falcon Mini-Rangers, deployed a marker buoy and moved away. Diving operations were begun. The divers descended along the buoy line and came upon the remains of the target. The buoy line was tied onto what appeared to be the hull, and was thought to be the high point of the target. A subsequent 10 meter circle search was performed about the hull, and the divers discovered a large deck fitting extending up even higher. The Least Depth and a Detached Position were then taken.

(b) DESCRIPTION OF TARGET FOUND: Target 4458 A was found to be ruins of a large wooden vessel. Approximately 20 feet of the deteriorating hull was sitting upright, resting in 64 feet of water. The framing and planking of the wreck were in a decayed state, and the remainder of the hull was buried in the silt. Offset about 15 feet from the hull was the remains of the bow. On the ruins of the bow was the heavily encrusted deck machinery which was the high point of the target. This machinery stood about five (5) feet above the bottom, while the highest remains of the hull were about 3 to 4 feet above the bottom. The wreck was in 64 feet of water. The Least Depth was taken on the high point of the machinery. Further investigation of the ruins of this target yielded no identifying information.

(c) RECOMMENDATIONS: The Hydrographer In Charge recommends that Target 4458 A be charted at the prescribed position using symbol No. 15, located in Section "O", page 13 of NOAA Chart No.1 (Eighth Edition, Printed: November 1984). Symbol No. 15 should be a sounding over a wreck with ~~no~~ a **danger curve** circumscribed about the Least Depth. ~~As the wreck is not considered a hazard to navigation, the standard wreck symbol should not be used. The symbol would unnecessarily alarm the user's of NOAA charts.~~ See section 7.a.2) of the Evaluation Report.

(d) LEAST DEPTH:
Taken by pneumofathometer on September 14, 1987 (DOY: 257)

1) TIME: 1050(L) 1450(Z) LEAST DEPTH READING (FT): 59.8
2) TIME: 1050(L) 1450(Z) LEAST DEPTH READING (FT): 59.8
3) TIME: 1050(L) 1450(Z) LEAST DEPTH READING (FT): 59.7

AVERAGE LEAST DEPTH (FT) : 59.8

AVERAGE PNEUMO DEPTH (FT) : 59.8
PNEUMO GAGE CORRECTOR (FT) : +0.6
Smooth ~~PREDICTED~~ TIDAL ZONE COR (FT) : ~~-0.9~~ -1.2
TRANSDUCER DRAFT (FT) : 0.0

ACTUAL LEAST DEPTH (FT) : 59.5

(e) DETACHED POSITIONS OF TARGET AND FIX NUMBERS:

1) HDAS FIX NO: 1106 E: 25179.2 N: 136801.2 ← pos # used
2) HDAS FIX NO: 1111 E: 25173.1 N: 136786.0
3) HDAS FIX NO: 1118 E: 25179.6 N: 136786.0

AVERAGE DP: E: 25177.3 N: 136791.1

CALCULATED GP: Lat: 38° 53' 54.004" N
Long: 076° 24' 05.114" W

(f) LORAN C RATES: W 16110.6 X 27574.8
Y 42649.1 Z 58950.1

V. AWOIS ITEM 4458 SUMMARY

Side scan coverage disproval requirements were completed for this AWOIS Item. The single target that was determined to be significant from the 400% side scan coverage was investigated by divers. Target 4458 A is not the AWOIS Item. Target 4458 A was found well outside of the search area and does not fit the description for AWOIS Item 4458. Target 4458 A should be charted and included in the AWOIS Listings according to the recommendations made. AWOIS Item 4458 was not found. It should be removed from the chart as the results of the extensive side scan survey have disproved the present existence of this AWOIS Item.

See section 7.a. 2) of the Evaluation Report.

See section 7.a.3) of the Evaluation Report.

AWOIS ITEM NUMBER: 4459

I. Area of Investigation

(a) State / County: Maryland / Anne Arundel

(b) Sublocality: Thomas Point Shoal Light

(c) Method of Positioning: Falcon Mini-Ranger

II. Description

AWOIS Item number 4459 was listed to be a 28 ft. sailboat with a 38 ft. mast which had been sunk at position 38° 52' 33.00" N, 076° 24' 48.00" W. The survey required verification and least depth if found, or disproval through 400% side scan sonar investigation with a 1000 meter minimum search radius.

III. PROCEDURES

Main Scheme Side Scan operations were conducted on June 05 (DOY: 156), June 08 (DOY: 159), June 09 (DOY: 160), June 10 (DOY: 161), June 30 (DOY: 181), July 15 (DOY: 196), July 16 (DOY: 197), August 18 (DOY: 230), and August 20 (DOY: 232). As AWOIS Items 4458 and 4459 were located in close proximity of each other, the North-South survey lines for 4459 were not run in the overlap area with 4458, as this portion of the survey was already completed. From side scan operations in June and July, the first 200% coverage to the 1000 meter search radius was developed and from the collected data, four (4) significant items were identified for further diving investigation. These targets were referred to as Targets 4459 C, 4459 D, 4459 F and 4459 G. The AWOIS Item was not found. The final 200% side scan coverage to the 1000 meter search radius was conducted in August. The survey was completed at that time.

IV. TARGET INVESTIGATIONS

TARGET: 4459 C (pos #1215)

(a) DIVE SUMMARY: On July 01, 1987 (DOY: 182), the RUDE positioned itself directly over the target using the DSF-6000 and the Falcon Mini-Rangers, deployed a marker buoy and moved away. Diving operations were begun. Divers descended on the buoy line. On the bottom the divers found debris spread about the surrounding area. A search of the general area resulted in discovery of the target with the major portion of the vessel still buried in the silt. A 10 m radius circle search was then initiated about the wreckage; this resulted in nothing new being found. The divers then concentrated on the target. A small piece of wood was found to be the high point of what appeared to be the largest section of the target that was exposed. The buoy line was tied off to this small piece of wood; the Least Depth and a Detached Position were determined from this high point.

charted depths of 43 ft.

(b) DESCRIPTION OF TARGET FOUND: Target 4559 C was found to be an old, wooden vessel which was buried deep in the silt and was resting with its keel bottom upside down in 39 feet of water. The wood was decayed and splintered with several smaller pieces of the vessel being scattered about the bottom. The largest section of the hull was measured to be 11 feet long, before being covered over by silt. The small piece of wood was barely higher than the hull itself; the piece of wood was approximately 2 feet above the bottom. Due to the advanced decayed state of the wood and the portion of the vessel buried in silt, further identification was not possible.

(c) RECOMMENDATIONS: The Hydrographer In Charge recommends that Target 4459 C be added to the AWOIS listing. Due to its present state of deterioration and deep interment, Target 4459 C poses no threat to navigation and should not be charted. Do not concur - See section 7.a.3)a) of the Evaluation Report.

(d) LEAST DEPTH:
Taken by pneumofathometer on July 01, 1987 (DOY: 182)

1) TIME: 0939(L); 1339(Z) LEAST DEPTH READING (FT): 38.4
2) TIME: 0939(L); 1339(Z) LEAST DEPTH READING (FT): 38.4
3) TIME: 0939(L); 1339(Z) LEAST DEPTH READING (FT): 38.5

AVERAGE LEAST DEPTH (FT): 38.4

AVERAGE PNEUMO DEPTH (FT) : 38.4
PNEMO GAGE CORRECTOR (FT) : +0.4
Smooth ~~PREDICTED~~ TIDAL ZONE COR (FT) : -1.~~2~~0
TRANSDUCER DRAFT (FT) : 0.0

ACTUAL LEAST DEPTH (FT) : **37.~~6~~8** plotted 38

(e) DETACHED POSITION OF TARGET AND FIX NUMBERS:
1) HDAS FIX NO: 1213 E: 23459.3 N: 134000.6
2) HDAS FIX NO: 1214 E: 23458.4 N: 133998.7
3) HDAS FIX NO: 1215 E: 23452.0 N: 134008.5 ← pos # used

AVERAGE DP: E: 23456.6 N: 134002.6

Calculated GP: Lat: 38° 52' 23.3~~26~~3" N
Long: 076° 25' 15.9~~86~~9" W

(f) LORAN C RATES: Not Obtained

TARGET: 4459 D (pos # 1313)

(a) DIVE SUMMARY: On July 15, 1987 (DOY: 196), the RUDE positioned itself directly over the target using the DSF-6000 and the Falcon Mini-Rangers, deployed a marker buoy and moved away. Diving

operations were begun. Divers descended down the buoy line and proceeded with a 20 m circle search. The tag line wrapped about the target. The divers then investigated the target. A Detached Position was taken above the target.

(b) DESCRIPTION OF TARGET FOUND: Target 4459 D was found to be a large heavy equipment-type tire with a small portion of chain attached. This tire could have possibly been was used as a fender aboard a workboat or on a barge before falling into the bay. The tire rests in a scour about one (1) foot deep, yet only extends approximately one (1) foot above the bottom, lying in 42 feet of water. — charted depths of 43 feet.

(c) RECOMMENDATIONS: The Hydrographer in Charge recommends that Target 4459 D be added to the AWOIS Listing, but not be charted. - Concur

(d) DETACHED POSITIONS OF CONTACT AND FIX NUMBERS:
1) HDAS FIX NO: 1313 E: 23221.7 N: 134869.7 ← pos # used
2) HDAS FIX NO: 1314 E: 23221.8 N: 134870.5
3) HDAS FIX NO: 1315 E: 23221.6 N: 134874.2

AVERAGE DP: E: 23221.7 N: 134871.5

CALCULATED GP: Lat: 38° 52' 51.4~~68~~7" N
Long: 076° 25' 25.~~898~~90" W

(e) LORAN C RATES: Not Obtained

TARGET: 4459 F (pos #1226)

(a) DIVE SUMMARY: On July 02, 1987 (DOY: 183), the RUDE positioned itself directly over the target using the DSF-6000 and the Falcon Mini-Rangers, deployed a marker buoy and moved away. Diving operations were begun. Divers descended on the buoy line and found the target lying partially buried in the silt. The target protruded approximately 1.5 feet above the bottom. A search about the target resulted in finding the scour observed on the echogram; no other debris was encountered. A Least Depth was taken as well as a Detached Position on this target.

(b) DESCRIPTION: Target 4459 F was identified as a tree trunk, approximately 14 feet long, partially buried in the silt and resting in 53 feet of water. The high point of the tree where the Least Depth was obtained was on the end of the trunk which extended only 1.5 feet above the bottom. There were no roots or branches present.
Charted depths of 60-64 feet.

(c) RECOMMENDATIONS: The Hydrographer in Charge recommends that Target 4459 F be included in the AWOIS listings at the prescribed position for a period of time not to exceed five years, as the target will deteriorate in time. ~~Target 4459 F should not be charted.~~ ← do not concur
See section 7.a.3) c) of the Evaluation.

(d) LEAST DEPTH:
Taken by pneumofathometer on July 02, 1987 (DOY: 183)

1) TIME: 1331(L); 1731(Z) LEAST DEPTH READING (FT): 52.4
2) TIME: 1331(L); 1731(Z) LEAST DEPTH READING (FT): 52.0
3) TIME: 1331(L); 1731(Z) LEAST DEPTH READING (FT): 52.0

AVERAGE LEAST DEPTH (FT): 52.1

AVERAGE PNEUMO DEPTH (FT) : 52.1
PNEUMO GAGE CORRECTOR (FT) : +0.4
Smooth ~~PREDICTED~~ TIDAL ZONE COR (FT) : ~~-0.5~~ -1.0
TRANSDUCER DRAFT (FT) : 0.0

ACTUAL LEAST DEPTH (FT) : ~~52.0~~ 51.5 Plotted 51

(e) DETACHED POSITIONS OF CONTACT AND FIX NUMBERS:
1) HDAS FIX NO: 1226 E: 24517.5 N: 132880.8 ← pos # used
2) HDAS FIX NO: 1235 E: 24519.1 N: 132880.0

AVERAGE DP: E: 24518.3 N: 132880.4

CALCULATED GP: Lat: 38° 51' 47.09~~1~~" N
Long: 076° 24' 31.73~~4~~" W

(f) LORAN C RATES: Not Obtained

TARGET: 4459 G (pos #1288)

(a) DIVE SUMMARY: On July 07, 1987 (DOY: 188), the RUDE positioned itself directly over the target using the DSF-6000 and the Falcon Mini-Rangers, deployed a marker buoy and moved away. Diving operations were begun. Divers descended on the buoy line and performed a 20 m circle search. After the tag line had snagged the target, the buoy line was moved onto it. An additional 10 m circle search was conducted about the target to find additional debris. No other debris was found. A Least Depth and a Detached Position was taken on the target.

(b) DESCRIPTION OF TARGET FOUND: Target 4459 G was found to be a 55 gallon drum in an advanced state of deterioration, with the top missing and the bottom intact. The drum was resting lengthwise on the bottom with numerous holes in its side. There was no evidence of the material which may have been contained in the drum. The high point was on the top rim of the drum opening; the drum extended approximately 2-3 feet above the bottom, resting in 41 feet of water. Charted depths of 43 feet.

(c) RECOMMENDATIONS: The Hydrographer In Charge recommends that Target 4459 G be added to the AWOIS listing at the prescribed position

for a period of time not to exceed five years, as Target 4459 G will completely deteriorate in that time. This target should not be charted.- Concur - See section 7.a. 3) d) of the Evaluation Report.

(d) LEAST DEPTH:
Taken by pneumofathometer on July 07, 1987 (DOY: 188)

1) TIME: 1359(L); 1759(Z) LEAST DEPTH READING (FT): 38.4
2) TIME: 1359(L); 1759(Z) LEAST DEPTH READING (FT): 38.8
3) TIME: 1359(L); 1759(Z) LEAST DEPTH READING (FT): 38.8

AVERAGE LEAST DEPTH (FT): 38.7

AVERAGE PNEUMO DEPTH (FT) : 38.7
PNEUMO GAGE CORRECTOR (FT) : +0.4
Smooth ~~PREDICTED~~ TIDAL ZONE COR (FT) : ~~-0.8~~ -1.6
TRANSDUCER DRAFT (FT) : 0.0

ACTUAL LEAST DEPTH (FT) : ~~38.3~~ 37.5 plotted 37

(e) DETACHED POSITION OF TARGET AND FIX NUMBERS:

1) HDAS FIX NO: 1288 E: 23399.0 N: 134545.0
2) HDAS FIX NO: 1289 E: 23393.0 N: 134540.7
3) HDAS FIX NO: 1292 E: 23391.1 N: 134551.9

AVERAGE DP: E: 23394.4 N: 134545.9

CALCULATED GP: LAT: 38° 52' 40.9~~35~~4" N
LONG: 076° 25' 18.67~~0~~" W

(f) LORAN C RATES: Not Obtained

V. AWOIS ITEM 4459 SUMMARY

AWOIS Item 4459 was covered 400% by side scan sonar for a minimum search radius of 1000 meters in accordance with established C&GS Side Scan Procedures. The four (4) targets that were determined to be significant from the first 200% side scan coverage were investigated by divers. Targets 4459 C, 4459 D, 4459 F and 4459 G were found in the search area but are not AWOIS Item 4459. All four targets should follow the recommendations to be included in the AWOIS Listings, but none of these targets should be charted. AWOIS Item 445~~7~~9 was not found and should be removed from the chart, as the results of the extensive side scan survey have disproved the present existence of this AWOIS Item.- Do not concur

See section 7. a. 3) of the Evaluation Report.

See section 7. a. 4) of the Evaluation Report.

AWOIS ITEM NUMBER: 4460

I. Area of Investigation

(a) State / County: Maryland / Anne Arundel

(b) Sublocality: Thomas Point Shoal Light

(c) Method of Positioning: Falcon Mini-Ranger

II. Description

AWOIS Item number 4460 was listed as a sunken sailboat with mast and antenna visible which had sunk in 40 feet of water at position 38° 51' 32.00" N, 076° 25' 23.00" W. The sailboat was marked with a temporary buoy according to LNM 48/79 and 50/79. The survey required verification and least depth if found, or disproval through 200% side scan sonar investigation with a 750 meter minimum search radius and an additional 200% side scan sonar investigation with a 1000 meter minimum search radius.

III. Procedures

Main Scheme Side Scan operations were conducted on May 20 (DOY: 140), May 21 (DOY: 141), August 13 (DOY: 225), August 14 (DOY: 226) and August 20 (DOY: 232). In May, the 300% coverage to the 750 meter search radius was developed and from the collected data only one (1) significant item was identified for further diving investigation. This target was referred to as Target 4460 A. While conducting operations during the Bathyscan 300 Test Project, another significant item was discovered that was outside of the search area for AWOIS Item 4460, and was labelled as Target 4460 B. After diving operations were concluded in August, the final 100% side scan coverage to the 1000 meter search radius was completed. Due to the high confidence level of the side scan instrument and the 300% coverage at the 750 meter search radius, the decision was made to survey the 1000 meter search radius with only 100% coverage as this was recognized as the most efficient use of vessel time. The survey was finished at that time.

IV. TARGET INVESTIGATIONS

TARGET: 4460 A (pos #1489)

(a) DIVE SUMMARY: On July 22, 1987 (DOY: 203), the RUDE positioned itself directly over the target using the DSF-6000 and the Falcon Mini-Rangers, deployed a marker buoy and moved away. Diving operations were begun. Divers descended on the buoy line and performed a 20 meter circle search until discovering the target. The target was resting on its side, partially buried in the silt. The buoy line was then moved to the target and another 10 meter circle search was conducted. No additional debris was found from the sweep of the surrounding area. Only a Detached Position was taken on the target.

Charted depths of 38-41 f.

(b) DESCRIPTION OF TARGET FOUND: Target 4460 A was found to be a 5 foot long tree stump, lying on its side in 36 feet of water. The partially covered trunk and the short roots protruded 1.5 feet above the bottom.

(c) RECOMMENDATIONS: The Hydrographer In Charge recommends that Target 4460 A should be included in the AWOIS listings for a period of time not to exceed five (5) years. Target 4460 A does not offer any hazard to navigation and should not be charted. ~ Concur

(d) DETACHED POSITIONS OF TARGET AND FIX NUMBERS:
1) HDAS FIX NO.: 1489 E: 22894.1 N: 132108.0 ← pos # used
2) HDAS FIX NO.: 1490 E: 22895.9 N: 132109.4

AVERAGE DP: E: 22895.0 N: 132108.7

CALCULATED GP: Lat: 38° 51' 21.8~~25~~3" N
Long: 076° 25' 38.9~~15~~2" W

(e) LORAN C RATES: W 16112.9
X 27573.7
Y 42617.0
Z 58930.4

TARGET: 4460 B (pos # 1524)

(a) DIVE SUMMARY: On August 10, 1987 (DOY: 222), the RUDE positioned itself directly over the target using the DSF-6000 and the Falcon Mini-Rangers, deployed a marker buoy and moved away. Diving operations were begun. The divers descended along the buoy line and performed a 20 meter circle search about the weight. The target was soon found resting upright on its keel. The buoy line was moved and tied off onto the bow cleat of the target. On August 12 (DOY: 224), divers returned to the area to obtain a least depth, however the marker buoy was no longer on location. Another buoy was deployed and a 30 meter circle search failed to relocate the target due to strong currents displacing the buoy. On August 13, 1987 (DOY: 225) divers located the item and obtained a Least Depth and a Detached Position on the target.

(b) DESCRIPTION OF TARGET FOUND: Target 4460 B was found to be a 23 foot long Chris Craft cabin cruiser lying upright on its keel in 36 feet of water. No name was visible; however, the home port of the wreck "Cape St. Claire, MD" was stenciled on the stern, and the 1983 Maryland registration number "2786 AA" was discovered on the bow. A check of the vessel registration numbers with the local Coast Guard confirmed the description of the vessel found. The Least Depth was taken on the top of the undamaged windshield, just forward of the helm. This high point was approximately seven (7) feet above the bay bottom.

(c) RECOMMENDATIONS: The Hydrographer In Charge recommends that Target 4460 B be charted as a hazardous wreck over which the depth is known. Symbol No. 15 should be used on the chart with the Least Depth included. This symbol is located in Section "O" on page 13 of NOAA Chart No.1 (Eighth Edition, Printed: November 1984). Target 4460 B should also be included in the AWOIS listings as described above. A Hazard To Navigation was transmitted via voice to U.S.Coast Guard on August 14 and by hard copy on August 15.

(d) LEAST DEPTH:
Taken by pneumofathometer on August 10, 1987 (DOY: 222)

1) TIME: 1304(L); 1704(Z) LEAST DEPTH READING (FT): 28.4
2) TIME: 1304(L); 1704(Z) LEAST DEPTH READING (FT): 28.4
3) TIME: 1304(L); 1704(Z) LEAST DEPTH READING (FT): 28.4

AVERAGE LEAST DEPTH (FT): 28.4

AVERAGE PNEUMO DEPTH (FT) : 28.4
PNEUMO GAGE CORRECTOR (FT) : +0.2
Smooth ~~PREDICTED~~ TIDAL ZONE COR (FT) : -0.~~3~~6
TRANSDUCER DRAFT (FT) : 0.0

ACTUAL LEAST DEPTH (FT) : 28.~~3~~0

(e) DETACHED POSITIONS OF TARGET AND FIX NUMBERS:
1) HDAS FIX NO.: 1517 E: 22097.8 N: 133185.2
2) HDAS FIX NO.: 1524 E: 22091.6 N: 133182.7 ← pos #used
3) HDAS FIX NO.: 7128 E: 22095.9 N: 133182.4

AVERAGE DP: E: 22095.1 N: 133183.4

CALCULATED GP: Lat: 38° 51' 56.55~~3~~" N
Long: 076° 26' 12.30~~3~~" W

(f) LORAN C RATES: W 16114.7
x 27578.1
Y 42623.6
Z 58931.0

V. AWOIS ITEM 4460 SUMMARY

AWOIS Item 4460 was covered 300% by side scan sonar for a minimum search radius of 750 meters and covered 100% by side scan sonar for a minimum search radius of 1000 meters in accordance with established C&GS Side Scan Procedures. Target 4460 A was determined to be significant from the side scan coverage and was investigated by divers. Target 4460 A was recommended to be added to the AWOIS Listing, but not charted. Target 4460 B was discovered while underway on the Bathyscan 300 Test Project. Although this target was located outside of the search area for AWOIS 4460, it was deemed significant

and also investigated. Target 4460 B was found to be a hazard to navigation, and was reported in a Notice To Mariners via radio transmission to Coast Guard Group Baltimore on August 14, 1987. On August 15, 1987, hard copy of the Hazard To Navigation report was submitted to the Fifth Coast Guard District and to N/MOA2. AWOIS Item 4460 was not discovered within the prescribed search area. It should be removed from the chart as the results of the extensive side scan survey have disproved the present existence of this AWOIS Item. Do not concur

See section 7.a.4) of the Evaluation Report.

See section 7.a.5) of the Evaluation Report.

AWOIS ITEM NUMBER: 4461

I. Area of Investigation

(a) State / County: Maryland / Anne Arundel

(b) Sublocality: 3/4 nm. SW of Bloody Point Bar Light

(c) Method of Positioning: Falcon Mini-Ranger

II. Description

AWOIS Item number 4461 was listed to be a 24 ft. sailboat with a 30 ft. mast which had been reportedly sunk at position 38° 50'00.00" N, 076° 24'00.00" W. The survey required verification and least depth if found, or disproval through 200% side scan sonar investigation with a 750 meter minimum search radius and an additional 200% side scan sonar investigation with a 1000 meter minimum search radius. The eastern limit of the required search area was restricted to the thirty (30) feet curve.

III. Procedures

Main Scheme Side Scan operations were conducted on May 18 (DOY: 138), May 19 (DOY: 139), August 20 (DOY: 232), August 24 (DOY: 236) and August 25 (DOY: 237). In May, the first 200% coverage to the 750 meter search radius was developed and from the collected data only one (1) significant item was identified for further diving investigation. This target was referred to as Target 4461 A. After diving operations were concluded, the final 200% side scan coverage to the 1000 meter search radius was completed in August. The survey was finished at that time.

IV. TARGET INVESTIGATION

TARGET: 4461 A (pos # 1166)

(a) DIVE SUMMARY: On June 18, 19, 22 and 30, 1987 (DOY: 169, 170, 173, and 181), the RUDE conducted deep water diving operations to investigate Target 4461 A. On June 18, 1987, the RUDE positioned itself directly over the target using the DSF-6000 and the Falcon Mini-Rangers, deployed a marker buoy and moved away. Diving operations were begun. Divers descended on the buoy line and made an unsuccessful attempt to find target with a 10 meter circle search. The 90 foot depth of the water restricted the bottom time available to the divers as they conducted their search. On June 19 divers initiated a 20m circle search about the weight of buoy line and snagged Target 4461 A. The marker buoy line was tied off to the helm in the wreck's cockpit. Due to a lack of bottom time, diving operations were halted for that day. On June 22 divers investigated the wreck and made measurements. A short search beyond the hull yielded no other debris or wreckage. The divers determined that the top of the windshield was the high point on the target. A Least Depth

was taken at the top of the windshield in the forward end the cockpit area. While reviewing the DSF-6000 echograms obtained over Target 4461 A, there arose a cause for concern about the unexplained presence of contacts hovering above the trace of the wreck. These contacts could not be identified with certainty as marine life or additional debris eminating from the wreck. On June 30 divers made a final 20 meter circle search centered at the windshield to snag any debris extending as high or higher then the high point of the wreck; no additional wreckage was found on the sweep. The trace obtained on the DSF-6000 on this date was also clear. The contacts were then percieved to be marine life.

(b) DESCRIPTION OF TARGET FOUND: Target 4461 A was found to be a 36-38 ft. long wooden cabin cruiser. The wreck is intact, in one piece and is resting upright with its bow in the soft bottom. The boat is slightly rotated on its port side. Most of the wood decking forward of the cockpit is present as are the cleats on the bow. The bow was measured to be 25 feet from the helm. The majority of the wood decking is absent about the stern section, exposing much of the ribbing in the after hull. The electronic equipment in the cockpit area includes a depthsounder and compass; this equipment suffered only water damage. No name nor identifying numbers could be found, neither on the transom, the bow nor in the cockpit. No other debris or wreckage was found around the main vessel. A limited investigation in the forward cabin was hampered by the thick silting below decks; again, nothing was found. The integrity of the hull was intact as far as the divers could probe. The wreck is situated in 80 feet of water, and the high point extends 12 feet above the bottom. The high point of the target was located at the windshield, just forward of the cockpit. The Least Depth and Detached Position were taken from this point.

(c) RECOMMENDATIONS: The Hydrographer in Charge recommends that Target 4461 A be charted at the prescribed position using symbol No. 15, located in Section "O", page 13 of NOAA Chart No. 1 (Eighth Edition, Printed: November 1984). Symbol No. 15 should be a sounding over a wreck **with no danger curve** circumscribed about the Least Depth. Because of the least depth and surrounding bottom depths, Target 4461 A should not be considered a hazard to navigation. The wreck is also located on a steeply sloping bottom which would prohibit deep draft vessel traffic from transiting the area. The standard wreck symbol should not be used, as the symbol would only unnecessarily alarm the user's of NOAA charts. — Concur

See section 7.a. 5) a) of the Evaluation Report.

(d) LEAST DEPTH:
Taken by pneumofathometer on June 22, 1987 (DOY: 173)

1)	TIME: 1319(L); 1719(Z)	LEAST DEPTH READING (FT): 67.9
2)	TIME: 1319(L); 1719(Z)	LEAST DEPTH READING (FT): 68.1
3)	TIME: 1319(L); 1719(Z)	LEAST DEPTH READING (FT): 68.1

AVERAGE LEAST DEPTH (FT): 68.0

AVERAGE PNEUMO DEPTH (FT) : 68.0
PNEUMO GAGE CORRECTOR (FT) : +1.3
Smooth ~~PREDICTED~~ TIDAL ZONE COR (FT) : ~~-0.8~~ -1.6

TRANSDUCER DRAFT (FT) : 0.0

ACTUAL LEAST DEPTH (FT) : ~~68.5~~ 67.7 plotted 67

(e) DETACHED POSITION OF TARGET AND FIX NUMBERS:

1) HDAS FIX NO: 1166 E: 25727.7 N: 129038.5 ← pos # used
2) HDAS FIX NO: 1167 E: 25728.7 N: 129039.7
3) HDAS FIX NO: 1170 E: 25738.6 N: 129041.0
4) HDAS FIX NO: 1171 E: 25734.4 N: 129038.3

AVERAGE D.P.: E: 25732.4 N: 129039.4

Calculated G.P.: Lat: 38° 49' 42.7~~06~~1" N
Long: 076° 23' 40.6~~88~~9" W

F. LORAN C RATES:

	1)	2)	3)
W	16104.3	16104.1	16104.4
X	27559.1	27559.2	27559.2
Y	42598.7	42598.7	42598.7
Z	58930.7	58930.6	58930.7

V. AWOIS ITEM 4461 SUMMARY

AWOIS Item 4461 was covered 200% by side scan sonar for a minimum search radius of 750 meters in accordance with established C&GS Side Scan Procedures. The single target that was determined to be significant by the Hydrographer In Charge from the first 200% side scan coverage was investigated by divers. Target 4461 A was found in the search area but was not considered to be AWOIS Item 4461 from the accompanying description. Because of this, the survey area was again covered 200% for a minimum search radius of 1000 meters with side scan operations following established C&GS procedures. The item listed as AWOIS item 4461 was not found. It should be removed from the charts as the results of the extensive side scan survey have disproved the present existence of this AWOIS Item. — Do not concur

See section 7.a.5) of the Evaluation Report.

L. MISCELLANEOUS

This report does not cover all of the items worked by the RUDE during this project. It covers only the first five which are located in the same general geographic area and are controlled by the same electronic control stations. Subsequent reports for this project will be forthcoming from both the RUDE and HECK. Those reports will contain duplicates of the necessary documents however background data such as baseline calibration log sheets, and geodetic control work sheets will not be duplicated.

A Hazard to Navigation Report was submitted to Coast Guard Group Baltimore via voice on August 14, 1987. The hazard was discovered while maneuvering to start a survey line for the Bathyscan Project which was conducted in the same area as Item 4460. Hard copy followup was mailed on August 15 to Fifth Coast Guard and other required offices. A copy of the correspondence is included in Appendix XI.

The work on these items has been interrupted several times during the course of this project. Two special projects were performed under changes to these original project instructions. Numerous days were taken up testing new versions of HDAS software which was and is still being completed concurrently with the performance of this project.

The first special project was a two week long test of a new sensor developed to perform shallow water sonar and sounding work simultaneously. The work was performed under the guidance of Don Pryor and Dean Seidel from the C&GS engineering staff in Rockville. The project goals were completed and all data was transmitted to that office for processing. The HDAS system is not currently capable of plotting corrected soundings therefore the data was post plotted at headquarters using a QUBIC TRACK IV that was also used on board to supply position information to the system being tested.

The second project was three days and involved and informal comparison of two side scan sonar systems. The targets used were ones that we had already located during the search for these five items. Targets of various sizes were chosen to demonstrate the resolution of the two systems. The project was under the guidance of Ben Swann for the same office as the first test project. Several people from various interested offices were aboard each day to observe the performance of the two systems. All goals of the test were completed and the data was transferred to Ben Swann for further evaluation.

During the course of this project three meetings have been held with RUDE, HECK, HDAS and AMC processing personnel to discuss data acquisition and processing software development and data submittal requirements for this new system. A result of those meetings was agreement of all parties on the data submittal requirements for this project. A copy of these data submittal requirements is included in appendix XIII if this report. It was also agreed that because the ships had the most current knowledge of the system that they would modify the descriptive report format to fit this system and type of project. Feedback from the Atlantic Marine Center on the report

format and data submittal requirements can be used to adjust future submittals.

This system software represents a substantially different way of "doing business". Numerous advances have been made, the most important of which is the use of multiple lines of position. Current guidelines for Hydrography do not adequately describe how the work should be done with this system on an "Item Investigation Survey". It will most likely take some time to revise those quidelines, OPORDERS, and instructions to reflect the use of this system. Because those quidelines are not yet revised, we have in the name of efficient and practical operations, changed the necessary procedures during the conduct of this project. The most significant change is the form and content of the descriptive report. We have attempted to include all of the information necessary to adequately review the survey and forward critical information for charting.

During the course of this work the disproval requirements in the AWOIS listings for these items have been changed several times. These changes occurred after work on several of the items was begun resulting in three items having data collected over two different coverage ranges. The initial 200% coverage was done at 750 meter radius. Divers investigated any noted significant items. If the AWOIS item was not discovered, the final 200% coverage was done at a range of 1000 meters in accordance with the final version of the AWOIS listing. The headquarters program requirements office did not feel it was necessary to rerun the initial 200% coverage to 1000 meters given the demonstrated performance of the sonar system and the low potential hazard presented by the items. These revised requirements are therefore adequate for disproval. *See section 8.e. of the Evaluation Report.*

M. RECOMMENDATIONS

The current "checking load" for the Falcon miniranger system is one critical per week and one non-critical per day. The HDAS system allows more than three lop's to be used at once. The algorithm that computes the position from these multiple lop's and speed and heading information is essentially performing a non-critical system check once per second. The measure of the fix quality and thence the accuracy of the lop's is the standard deviation of the least squares fix and the residuals computed for each fix. This is a reliable measure of lop accuracy as long as the fix geometry is reasonable and the number of lop's used in the solution is more than two. For the HDAS system, it is recommended that the critical system check requirement be reduced to once when the control is first set up to check the minirangers and the control. After that check is performed it should not be necessary to perform a critical until the stations are moved or the hydrographer notices a problem with the on line fix quality. The non-critical checks should be reduced to once per week. This would allow a confidence check in the unlikely event that the control geometry allowed a degrading miniranger to be unnoticed in the standard deviation and residual figures. The reduction in the amount of effort required to check this system can free a tremendous amount of time for

The proposal by the field to change the calibration requirements has been addressed by N/MOA 23 separate from this survey. The proposals and comments by all concerned parties are being considered by Nautical Chart Division.

production also reducing the amount of time required to handle paper records and abstracts.

The resolution of the EG&G system is good enough for us to have identified and dove on such things as tires, drums, and tree trunks that extend only one to two feet above the bottom in 35 to 50 feet of water. We are very confident with this system that true hazards to navigation within our search area can be located with the first 200% coverage. During this portion of the project we identified and recommended for charting two items that were outside the prescribed search areas. Given the above statements it seems logical that the chances of finding an item that does exist would be increased by one third if we could decrease coverage requirements to 200% and increase the search radius by one third. This could increase the number of dives also by one third. The time saved by performing fewer miles of side scan sonar could be taken up performing more diving operations. The time and resource requirements should be close to the same either way. It is recommended that the coverage requirements be reduced to 200% for a disproval and the search radius be increased by one third.

Respectfully submitted,

John F. Novaro, LT, NOAA
Operations Officer
NOAA Ship RUDE

for John F. Novaro

Thomas R. Waddington, ENS, NOAA
Third Officer
NOAA Ship RUDE

Wholesale reduction (to 200%) of the requirement of 400% coverage for disproval is strongly opposed by N/MOA 23. Certain items are of such a nature that 200% coverage would suffice, others would require 400% coverage to insure disproval.

LETTER OF APPROVAL

FIELD NO. RU-20-01-87

OPR-E60987-RU/HE-87

Field operations contributing to the accomplishment of this survey were conducted under my supervision with frequent personal checks of progress and adequacy. This report and field sheets have been closely reviewed and are considered complete and adequate for charting.

Alan D. Anderson

Alan D. Anderson, LCDR, NOAA
Commanding Officer
NOAA Ship RUDE

NAVISOFT 300 CONTROL STATION TABLE INPUT 24 Sep 02:00:58

Station No ? 1

No	Type	Easting	Northing	H	W	Freq	Vel	Code	Date
100	F	28638.3	140860.6	7	9	0.0	0	4	9 Sep 1987
101	F	25989.7	129610.0	18	9	0.0	0	6	9 Sep 1987
102	F	22187.8	136876.1	14	9	0.0	0	7	9 Sep 1987
103	F	20634.4	144558.6	13	9	0.0	0	1	9 Sep 1987
303	F	25170.2	134540.0	0	0	0.0	0		4 May 1987
200	0	29036.0	140817.3	0	0	0.0	0		5 May 1987
201	0	25991.0	129607.5	0	0	0.0	0		4 May 1987
202	0	22186.1	136875.0	0	0	0.0	0		4 May 1987
203	0	17463.9	145757.5	0	0	0.0	0		28 May 1987
204	0	17855.8	146066.2	0	0	0.0	0		28 May 1987
205	0	26654.3	147388.1	0	0	0.0	0		28 May 1987
206	0	27120.6	147246.2	0	0	0.0	0		28 May 1987

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NAVISOFT 300 CONTROL STATION TABLE INPUT 24 Sep 02:00:58

Station No ? 1

No	Type	Easting	Northing	H	W	Freq	Vel	Code	Date
309	F	24132.6	134298.0	0	0	0.0	0		3 Jun 1987
		0.0	0.0	0	0	0.0	0		
		0.0	0.0	0	0	0.0	0		
56A	0	25866.6	140648.9	0	0	0.0	0		8 Sep 1987
302	F	25866.6	140648.9	0	0	0.0	0		8 May 1987
55A	0	28186.0	148976.0	0	0	0.0	0		8 Sep 1987
55_	0	27487.8	149811.4	0	0	0.0	0		8 Sep 1987
55C	0	26884.9	147875.3	0	0	0.0	0		8 Sep 1987
55D	0	27945.5	149766.3	0	0	0.0	0		8 Sep 1987
304	F	25268.9	129574.9	0	0	0.0	0		18 May 1987
310	F	23280.2	132420.8	0	0	0.0	0		20 May 1987
308	F	23779.8	136211.5	0	0	0.0	0		21 May 1987

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NAVISOFT 300 CONTROL STATION TABLE INPUT 24 Sep 02:00:58

Station No ? 1

No	Type	Easting	Northing	H	W	Freq	Vel	Code	Date
		0.0	0.0	0	0	0.0	0		
59G	0	23394.4	134545.9	0	0	0.0	0		16 Jul 1987
59F	0	24518.3	132880.4	0	0	0.0	0		16 Jul 1987
59C	0	23456.6	134002.6	0	0	0.0	0		16 Jul 1987
59D	0	23221.7	134871.5	0	0	0.0	0		16 Jul 1987
60A	0	22895.0	132108.7	0	0	0.0	0		10 Aug 1987
60B	0	22095.1	133183.4	0	0	0.0	0		13 Aug 1987
57A	0	23744.3	136388.1	0	0	0.0	0		10 Aug 1987
57B	0	23679.1	135933.2	0	0	0.0	0		10 Aug 1987
57C	0	22846.8	135928.5	0	0	0.0	0		10 Aug 1987
61A	0	25732.4	129039.4	0	0	0.0	0		10 Aug 1987
58A	0	25177.3	136791.1	0	0	0.0	0		18 Aug 1987

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CONTROL STATION REFERENCE LIST

STATION NAME	STATION NUMBER	GEOGRAPHIC POSITION	TRANSFORMED POSITION
KENT IS~~LAND~~ SP~~EED~~ TR~~IAL~~ NF ~~RANGE~~ RNG 1981	100	38°56'06.437"N 076°21'42.160"W	X= 28638.250 Y= 140860.644
BLOODY POINT BAR ~~LIGHTHOUSE~~ LH 1898	101	38°50'01.161"N 076°23'30.067"W	X= 25991.036 Y= 129607.515
THOMAS ~~POINT~~ PT SHOAL ~~LIGHTHOUSE~~ LH 1906	102	38°53'56.274"N 076°26'09.262"W	X= 22186.054 Y= 136874.963
GREENBURY POINT SHOAL LH 1898	103	38°58'05.191"N 076°27'15.243"W	X= 20634.360 Y= 144558.560
ANNAPOLIS ST~~ATE~~ CAPITOL BLDG, DOME 1933	203	38°58'43.536"N 076°29'27.207"W	X= 17463.930 Y= 145757.489
CHESAPEAKE BAY BRIDGE ~~WEST~~ TOWER 1957	205	38°59'37.848"N 076-23-05.679"W	X= 26654.276 Y= 147388.146
CHESAPEAKE BAY BRIDGE E~~AST~~ TOWER 1957	206	38°59'33.309"N 076°22'46.276"W	X= 27120.626 Y= 147246.225

TARGET ABSTRACT

PROJECT: OPR-E609-RU-87 VESNO: 9040

AWOIS INVESTIGATION NUMBER: 4457

DATE/DOY	TARGET NUMBER	TARGET TIME	TOWFISH HEIGHT	TARGET RANGE	SHADOW LENGTH	TARGET HEIGHT	TARGET POSITION X\Y	REMARKS
	516.101	174130	12.00	53.000	9.000	1.74	23742/136378	Target 4457-A
	522.325	175658	10.00	56.000	4.000	0.67	23675/135942	Target 4457-B
5/22/87	530.225	144110	12.00	35.100	3.900	1.20	23740/136375	same as A
	538.301	145855	11.00	51.100	3.900	0.78		same as B
5/22/87	540.051	150205	11.00	15.500	4.500	2.48	23744/136392	same as A
5/22/87	555.275	153530	11.00	45.500	4.500	0.99	23677/135940	same as B
	635.151	143930	7.25	34.500	1.500	0.30		N/S
	640.575	145328	7.50	38.400	1.500	0.28		N/S
	640.245	145222	7.75	20.000	1.000	0.37		N/S
	642.125	145559	7.75	37.250	1.750	0.35		N/S
	642.575	145730	7.50	17.500	1.250	0.50		N/S
	651.475	151646	7.00	16.500	1.250	0.49		N/S
	653.325	152018	6.50	22.500	2.500	0.65		N/S
	663.025	154522	5.75	69.000	1.500	0.12		N/S
	680.575	163802	7.00	64.250	1.750	0.19		N/S
	689.375	170503	6.25	23.000	2.000	0.50		Target 4457-C
6/2/87	696.025	172128	6.25	22.750	5.250	1.17	22850/135873	same as C
	837.275	183400	9.50	20.000	0.750	0.34		N/S

TARGET ABSTRACT

PROJECT: OPR-E609-RU-87 VESNO: 9040

AWOIS INVESTIGATION NUMBER: 4458

DATE/DOY	TARGET NUMBER	TARGET TIME	TOWFISH HEIGHT	TARGET RANGE	SHADOW LENGTH	TARGET HEIGHT	TARGET POSITION X\Y	REMARKS
5/14/87	P108.175	144840	15.00	130.000	4.000	0.45		N/S
5/18/87	P165.550	140835	14.50	50.000	3.000	0.82		N/S
	P168.375	141400	16.00	78.000	2.000	0.40		N/S
8/17/87	S1717.400	161707	13.00	27.000	2.000	0.90		N/S-AFTER RECON
8/18/87	P2071.250	174740	13.00	39.000	5.000	1.48	25180/136789	TARGET 4458A

TARGET ABSTRACT

PROJECT: OPR-E609-RU-87 VESNO: 9040

AWOIS INVESTIGATION NUMBER: 4459

DATE/DOY	TARGET NUMBER	TARGET TIME	TOWFISH HEIGHT	TARGET RANGE	SHADOW LENGTH	TARGET HEIGHT	TARGET POSITION X\Y	REMARKS
6/5/87	P850.425	133136	4.50	19.000	1.500	0.33		N/S
6/5/87	P858.230	134658	7.00	30.000	2.000	0.44		N/S
6/5/87	P863.080	135732	7.50	33.000	1.500	0.33		N/S
6/8/87	P943.125	173422	7.50	10.750	1.000	0.64		N/S
6/9/87	P963.025	135029	4.50	34.000	3.500	0.42		N/S
6/9/87	S965.040	135431	2.50	14.000	1.000	0.17		N/S
6/9/87	S971.530	141008	6.00	12.000	2.500	1.03	23460/133932	Target 4459-C
6/9/87	S976.475	142411	5.00	20.000	4.800	0.97		same as C
6/9/87	S976.500	142425	5.00	31.000	1.000	0.16		N/S
6/9/87	S987.280	150036	5.00	20.000	3.500	0.74	23388/134558	Target 4459-G
6/9/87	S997.158	152449	5.50	21.000	2.000	0.48		same as G
6/9/87	P1001.475	153450	5.00	21.000	1.000	0.23		N/S
6/9/87	P1013.051	160305	5.00	25.000	1.500	0.28		N/S
6/9/87	P1022.398	163105	6.00	29.000	5.000	0.88	23199/133962	Target 4459-D
6/10/87	P1128.395	185551	8.00	13.000	2.500	1.29		N/S (66' of water)*
6/8/87	P947.360	174525	7.50	15.000	1.000	0.47		N/S
6/10/87	S1134.101	171809	9.00	54.000	1.300	0.21		N/S
6/10/87	P1144.275	183748	8.75	45.000	3.250	0.59		N/S
6/10/87	P1152.025	185523	10.00	12.000	2.500	1.72 ERR	24523/132938	Target 4459-F

*This target and its acoustic shadow is very faint and weak. This target was not detected on any other search tracks. (Three other search tracks should have detected this target.) This target is not considered significant.

TARGET ABSTRACT

PROJECT: OPR-E609-RU-87 VESNO: 9040

AWOIS INVESTIGATION NUMBER: 4460

DATE/DOY	TARGET NUMBER	TARGET TIME	TOWFISH HEIGHT	TARGET RANGE	SHADOW LENGTH	TARGET HEIGHT	TARGET POSITION X\Y	REMARKS
5/20/87	P371.475	162013	10.00	21.750	1.250	0.54		N/S
5/20/87	P422.225	163146	8.50	32.000	1.000	0.26		N/S
5/21/87	P453.175	143936	9.00	32.000	1.000	0.27		N/S
5/21/87	P461.375	145511	9.00	28.000	2.000	0.60		N/S
5/21/87	P467.065	150720	9.00	23.000	2.000	0.72		Target 4460-A
5/21/87	P475.175	152628	9.00	22.000	3.000	1.08	22909/132118	same as A

PROJECT: OPR-E609-RU-87 VESNO: 9040

AWOIS INVESTIGATION NUMBER: 4461

DATE/DOY	TARGET NUMBER	TARGET TIME	TOWFISH HEIGHT	TARGET RANGE	SHADOW LENGTH	TARGET HEIGHT	TARGET POSITION X\Y	REMARKS
	P239.175	152851	11.00	52.000	3.000	0.60		N/S
	P283.44	171528	21.75	58.125	1.875	0.68		N/S
	P296.125	174742	16.50	52.800	15.200	3.69	25727/129042	Target 4461-A
	S298.575	175651	20.00	15.200	4.800	4.80	25731/129098	same as A
	S308.501	181843	15.00	40.000	8.000	2.50	25756/128986	same as A
	P219.551	144133	30.00	98.000	3.000	0.89		N/S
	S229.525	150458	13.50	47.000	2.000	0.55		N/S
	S229.531	150501	13.50	28.000	1.500	0.69		N/S
	S229.425	150440	13.50	33.000	1.000	0.40		N/S
	S293.145	174145	12.50	66.000	4.000	0.71		N/S
	S267.575	163410				1.08	24529/129000	Uninvestigated contact

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
NOAA Ship RUDE
439 West York St.
Norfolk, VA 23510

August 15, 1987

TO: N/MOA2 - Charles B. Ellis

FROM: RUDE - Alan D. Anderson

SUBJECT: Hazard to Navigation Report

The attached hazard to navigation report was forwarded to the Guard District Group Baltimore via voice on August 14, 1987. Please forward to Chart Information Section and DMAHTC in accordance with Hydro Manual 5.9. The hazard was discovered by the ship's echo sounder during the recent Bathyscan test project. It does not appear to be one of the elusive AWOIS items.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
NOAA Ship RUDE
439 West York St.
Norfolk, VA 23510

August 15, 1987

TO: Commander, Fifth Coast Guard District

FROM: Alan D. Anderson
Commanding Officer, NOAA Ship RUDE

SUBJECT: Hazard to Navigation

Attached is the hard copy of a Hazard to Navigation forwarded through Group Baltimore on August 14, 1987.

NOTICE TO MARINERS
NOAA SHIP RUDE
AUGUST 14,1987

A TWENTY-THREE (23) FOOT L.O.A. CRIS CRAFT CABIN CRUISER COVERED BY 28.7 FEET AT MLLW WAS DISCOVERED IN 37 FEET OF WATER; CHART NUMBER 12270; LATITUDE: 38 DEGREES 51 MINUTES 56.53 SECONDS N; LONGITUDE: 076 DEGREES 26 MINUTES 12.30 SECONDS W; DISTANCE OF 1.98 NAUTICAL MILES AND BEARING OF 181 DEGREES (TRUE) FROM THOMAS POINT SHOAL LIGHT; DISTANCE OF 2.84 NAUTICAL MILES AND BEARING OF 313 DEGREES (TRUE) FROM BLOODY POINT BAR LIGHT; LORAN C RATES: 16114.7, 27578.1, 42623.6, 58931.0.

See contact 4460B, section 7.a.4)b) of the Evaluation Report.

COMMANDER (ØAN)
FIFTH COAST GUARD DISTRICT
431 CRAWFORD STREET
PORTSMOUTH, VA 13705

CHART INFORMATION SECTION, N/CG222
NOAA
6001 EXECUTIVE BOULVARD
ROCKVILLE, MARYLAND 20852

PROGRAM SERVICES DIVISION
ATLANTIC MARINE CENTER, ATTN MOA2
439 WEST YORK STREET
NORFOLK, VA 23510

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE

TIDE NOTE FOR HYDROGRAPHIC SHEET

DATE: October 27, 1987

Marine Center: Atlantic

OPR: E609

~~Hydrographic Sheet:~~ AWOIS Item Investigation

Locality: Chesapeake Bay

Time Period: May 18 - September 14, 1987

Tide Station Used: 857-5512 Annapolis, MD

Plane of Reference (Mean Lower Low Water): 4.30 ft.

Height of Mean High Water Above Plane of Reference: 1.2 ft.

Remarks: Recommended Zoning:

1. For AWOIS Item #4457, Zone Direct.
2. For AWOIS Items #4458, 4459 apply a -0 hr 30 minute time correction and a X0.97 range ratio to all heights.
3. For AWOIS Item #4460 apply a -0 hr 45 minute time correction and a X1.02 range ratio to all heights.
4. For AWOIS Item #4461 apply a -1 hr 00 minute time correction and a X1.08 range ratio to all heights.

James R. Hubbard
Chief, Tidal Datum Quality
Assurance Section

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
OFFICE OF CHARTING AND GEODETIC SERVICES
ROCKVILLE, MARYLAND 20852

JUN 16 1989

RCA

MEMORANDUM FOR: Commander Russell C. Arnold, NOAA
Chief, Hydrographic Surveys Branch

Maureen R. Kenny

FROM: Lieutenant Commander Maureen R. Kenny, NOAA
Chief, Operations Section

SUBJECT: Addendum to FE-305SS Evaluation Report

An AWOIS and SURF check of FE-305SS has been performed. Due to the knowledge gained on the use of side scan sonar as an investigative tool since the system has been in use, a review was made which included a re-evaluation of the initial survey requirements designated in the AWOIS file. This review resulted in changes to side scan sonar survey requirements for certain AWOIS items, which in turn resulted in changes to item resolutions as stated in the evaluation report.

Results of this review follow. Discussions are limited to those AWOIS items in which changes and/or additions to the evaluation report are required.

AWOIS Item No. 4459

This item is a 28-foot sailboat with a 38-foot mast. Review of the search requirements showed the initial requirement for 400-percent side scan sonar coverage to be unnecessary; 200-percent coverage is sufficient. Based on discussions with Mr. R. D. Sanocki, MOA232, it has been determined that 200-percent side scan sonar coverage was achieved with no indication of this specific item. This item is considered disproved. It is recommended that the dangerous sunken wreck, PA, charted at latitude 38°52'33"N, longitude 76°24'48"W be removed from the chart.

AWOIS Item No. 4460

This item is reported to be a sunken sailboat with a mast and antenna visible. Review of the search requirements showed the initial requirement for 400-percent side scan sonar coverage to be unnecessary; 200-percent coverage is sufficient. As stated in the Evaluation Report, 200-percent coverage was achieved with no indication of the specific item. This item is considered disproved. It is recommended that the dangerous sunken wreck,

NOAA FORM 76-155
(11-72)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

GEOGRAPHIC NAMES

SURVEY NUMBER

FE-305 SS

Name on Survey	A ON CHART NO.	B ON PREVIOUS SURVEY NO.	C ON U.S. QUADRANGLE MAPS	D FROM LOCAL INFORMATION	E ON LOCAL MAPS	F P.O. GUIDE OR MAP	G RAND MCNALLY ATLAS	H U.S. LIGHT LIST	K	
CHESAPEAKE BAY (title)										1
KENT POINT (title)										2
MARYLAND (title)										3
THOMAS POINT SHOAL (title)										4
										5
										6
										7
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										25

Approved:

Charles L. Harrington

Chief Geographer - N/CG2x5

MAY 13 1988

NOAA FORM 76-155 SUPERSEDES C&GS 197

09/28/88

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: FE-305

NUMBER OF CONTROL STATIONS	7
NUMBER OF POSITIONS	2350
NUMBER OF SOUNDINGS	8

	TIME-HOURS	DATE COMPLETED
* PREPROCESSING EXAMINATION	17	02/03/88
VERIFICATION OF FIELD DATA	97	03/25/88
QUALITY CONTROL CHECKS	37	
EVALUATION AND ANALYSIS	228	09/28/88
FINAL INSPECTION	32	09/22/88
TOTAL TIME	394	

MARINE CENTER APPROVAL	09/29/88

* Preverification time is not considered as part of total survey time.

NOAA FORM 61-29
(12-71)

U. S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

LETTER TRANSMITTING DATA

REFERENCE NO.
MOA23-100-88

DATA AS LISTED BELOW WERE FORWARDED TO YOU BY (Check):

- [ ] ORDINARY MAIL
- [ ] AIR MAIL
- [x] REGISTERED MAIL
- [ ] EXPRESS
- [ ] GBL (Give number) _____

DATE FORWARDED
16 November 1988

NUMBER OF PACKAGES
two (2)

TO:

Chief, Data Control Branch, N/CG243
Room 151, WSC-1
Hydrographic Surveys Branch
National Ocean Service
Rockville, MD 20852

NOTE: A separate transmittal letter is to be used for each type of data, as tidal data, seismology, geomagnetism, etc. State the number of packages and include an executed copy of the transmittal letter in each package. In addition the original and one copy of the letter should be sent under separate cover. The copy will be returned as a receipt. This form should not be used for correspondence or transmitting accounting documents.

FE-305SS (RU-20-1-87)
OPR-E609, MARYLAND, CHESAPEAKE BAY

Pkg. 1: (Envelope)

1 Original Descriptive Report containing one 1:40,000 scale smooth plot and accompanying position overlay, five 1:20,000 scale smooth plots and accompanying position overlays, eight track plots, and fourteen swath plots.

Pkg. 2: (Box)

1 Accordian Folder containing data (printouts, echograms, and side scan sonargrams) for AWOIS Items #4457 (21 May - 22 July, 1987), #4458 (17 Aug. - 18 Aug., 1987), and #4459 (5 June - 10 June, 1987).

1 Accordian Folder containing data (printouts, echograms, and side scan sonargrams) for AWOIS Items #4459 (30 June - 20 Aug., 1987), #4460 (5 May - 20 Aug., 1987), and #4461 (19 May - 20 Aug., 1987).

1 Accordian Folder containing data (printouts, echograms, and side scan sonargrams) for AWOIS Items #4458 (14 May - 18 May, 1987), and #4461 (24 Aug. - 25 Aug., 1987).

1 Envelope of Data removed from the Descriptive Report

1 Envelope of Approved Tides

FROM: (Signature) Maurice B. Hickson, III
Maurice B. Hickson, III

Return receipted copy to:

Chief, Hydrographic Surveys Branch,
N/MOA23
Atlantic Marine Center
439 W. York Street
Norfolk, VA 23510-1114

RECEIVED THE ABOVE
(Name, Division, Date)

Dwayne S. Clark
November 29, 1988
N/CG243

NOAA FORM 61-29 SUPERSEDES FORM C&GS 413 WHICH MAY BE USED.

☆U.S.GPO:1983-0-664-008/1192

ATLANTIC MARINE CENTER
EVALUATION REPORT

SURVEY NO.: FE-305SS FIELD NO.: RU-20-1-87

Maryland, Chesapeake Bay, Kent Point to Thomas Point Shoal

SURVEYED: April 28, 1987 through September 14, 1987

SCALE: 1:20,000 PROJECT NO.: OPR-E609-RU/HE-87

SOUNDINGS: EG&G Model 260 Side Scan Sonar, Pneumatic Depth Gauge, and RAYTHEON DSF-6000N Echosounder

CONTROL: MOTOROLA Falcon 484 Mini-Ranger (Range/Range)

Chief of Party.....A. D. Anderson

Surveyed by.....J. F. Novaro
.....K. F. Sharack
.....T. R. Waddington

1. INTRODUCTION

a. The purpose of this survey is adequately defined in the Descriptive Report and the Project Instructions. Processing of this survey has been modified so that only the wrecks and obstructions found and, if obtained, their least depths have been smooth plotted. This modified processing is considered complete in regard to nautical charting requirements.

b. This is primarily a side-scan sonar survey. A Raytheon DSF-6000N echosounder was operated concurrently with the side-scan sonar. Echo sounder developments were conducted to search for items found on the sonargrams. The echosounder data was used in positioning the item and in determining an item's significance and approximate depth. The hydrography is considered reconnaissance hydrography and not suitable for charting. Pneumatic depth gauges were used to determine least depths.

c. One smooth plot at 1:40,000 scale of the wrecks and obstructions found by this survey, an accompanying position overlay, five 1:20,000 smooth plots and accompanying position overlays, eight track plots at 1:20,000 scale, and fourteen swath plots at 1:20,000 scale were generated and are attached to this report. These plots are considered the final plots or smooth sheets for this survey.

d. Corrections and notes made by the evaluator to the Descriptive Report are denoted in red ink.

2. CONTROL AND SHORELINE

a. Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983. Office processing of this survey is based on these values. All geographic positions listed from other sources are on the North American Datum of 1927. The smooth plot of the wrecks and obstructions found by this survey has been annotated with ticks showing the computed mean shift between the survey datum (NAD 1983) and NAD 1927. To place this survey on the North American Datum of 1927, move the projection lines 0.411 seconds (12.7 meters) north in latitude and 1.155 seconds (27.8 meters) east in longitude.

The horizontal control stations listed in the Control List (Appendix III.) of this survey are of Third Order, Class I accuracy or better. Two stations used for electronic control are eccentric stations which are not listed in the Descriptive Report. See section 4.e. of this report. Positioning methods are adequately discussed in the Descriptive Report. Calibration methods are adequately discussed in the Descriptive Report and adequate calibration data is recorded in the field records.

b. Charted shoreline within the limits of the smooth plots of this survey was not drawn on the smooth plots. Charted shoreline for orientation is not considered necessary for chart application of this survey data.

3. HYDROGRAPHY

The least depths collected on the wrecks and obstructions found during this survey are the only valid soundings for charting. All other soundings collected on this survey are of reconnaissance value only. The investigation of features and the determination of least depths are considered adequate except as noted in this report.

4. CONDITION OF SURVEY

The adequacy of the final field sheets, survey records, and reports, and conformity to the requirements of the HYDROGRAPHIC MANUAL and the PROVISIONAL SIDE SCAN SONAR MANUAL were not considered during the modified processing of this survey. Only deficiencies which impact charting recommendations or affect the accuracy, adequacy, or interpretation of this survey are noted in this report. These deficiencies are noted as follows and in sections 7. and 8. of this report.

a. In general, side scan sonar contacts on the present survey which have a computed height above the bottom of 2

feet or less were considered insignificant by the hydrographer.

b. The majority of sonargrams for this survey show high concentrations of marine life, water column interference (thermoclines, wakes, etc.), and noise (equipment problems, other vessels, etc.) which degrade the quality of the sonargrams and could possibly obscure a significant contact. In many cases, but not all cases, additional lines were run to insure adequate coverage of the assigned area.

c. The least depths obtained by pneumatic depth gauge on this survey are in question. Two different pneumatic depth gauges were used during this survey. Both of these pneumatic depth gauges were calibrated and the calibration data for each gauge is included in the survey data. However, the hydrographer did not indicate in any of the survey records which gauge was used on any of the least depths. Therefore, the pneumatic depth gauge correctors applied to the least depths may be erroneous (in this case ±0.2 feet). Least depth determination by pneumatic depth gauge should be accomplished in accordance with Hydrographic Survey Guideline #55.

d. Significant portions of data were missing from this survey due to data being lost in the HDAPS system. This loss of data degraded the survey and prevented two items from being disproved.

e. Two electronic control stations are noted as being eccentric stations in section I. of the Descriptive Report. No computations nor geographic positions of these eccentric control stations were provided. The geographic positions listed for these electronic control stations are the N.G.S. Database geographic positions of the actual lighthouses. These two stations are BLOODY POINT BAR LIGHTHOUSE, 1898 and THOMAS POINT SHOAL LIGHTHOUSE, 1906. The hydrographer input different coordinate (x,y) values than the values computed for these two stations. The coordinates used for these stations could not be verified. Because of this possible control error the positions of wrecks and obstructions located by this survey maybe in error. If an error exists, it is presumed to be imperceptible at the survey scale.

f. One significant contact was not flagged, logged, plotted or investigated. This contact is addressed in section 7.a.5)b) of this report.

g. No standard Dive Report Forms were submitted with this survey. It would have been beneficial during processing to have had the Dive Reports and the drawings of the wrecks and obstructions investigated. See AMC OPORDER 85.

h. It would have been beneficial if local dive groups, dive shops, and professional diving companies within the area were contacted. Valuable information may have been available on the assigned AWOIS Items and other uncharted wrecks and obstructions which may exist within the area.

5. JUNCTIONS

There are no junctions on this survey.

6. COMPARISON WITH PRIOR SURVEYS

a. HYDROGRAPHIC SURVEYS

H-2042 (1898) 1:20,000
H-5501 (1933) 1:20,000
H-8522 (1960) 1:10,000

These prior surveys are common to the entire present survey. Comparisons between present and prior hydrography were not made since all present hydrography, except the detached soundings on items located, is considered reconnaissance hydrography. The present survey reconnaissance hydrography was neither processed nor plotted by the field or office. Correctors were not determined for this hydrography. Comparisons between present reconnaissance hydrography and prior soundings were not accomplished. Wrecks and obstructions found by this survey are discussed in section 7.a. of this report.

It is not the intent of the present survey to supersede but only to supplement prior hydrography.

b. WIRE DRAG SURVEYS

H-5197 (1932-33) 1:20,000
H-8523WD (1960) 1:10,000

Prior survey H-5197 has both hydrography and wire drag. The prior hydrography is not common to the present survey. The prior wire drag is common to a small portion of the area of investigation of AWOIS Item #4457 but not common to any of the wrecks or obstructions found by the present survey. No prior survey hangs or groundings are common to the present survey. No conflicts exist between the present side scan sonar data and the prior wire drag data.

Prior wire drag survey H-8523WD is common to part of the area of investigation of AWOIS Item #4458. One obstruction (wreckage) found by the present survey is common to this prior survey and is in conflict with the prior wire drag effective depths. This obstruction (wreckage) is addressed in section 7.a.2) of this report. No prior survey hangs or groundings are common to the present survey.

7. COMPARISON WITH CHART 12270 (23rd Ed., Sept. 13, 1986)

a. HYDROGRAPHY

The charted hydrography originates with the previously discussed prior surveys. Only one charted sounding originates from a source not readily ascertainable. The previously discussed prior surveys require no further consideration. The one charted sounding from a source not identified is the 43-foot sounding in Latitude 38°53'06"N, Longitude 76°25'16"W which does not conflict with the present survey. Attention is directed to the following:

1) AWOIS #4457, a charted dangerous sunken wreck, PA, in Latitude 38°53'35"N, Longitude 76°25'03"W, position approximate, originated with Local Notice to Mariners No. 34 of 1979 and is identified as an 24-foot sailboat sunk in 46 feet of water. A 24-foot sailboat rising approximately 6 feet off the bottom in prior (H-2402) depths of 46½-47 feet was found in Latitude 38°53'40.73"N, Longitude 76°25'04.50"W. This wreck was designated as contact #4457A (position #1447). The sailboat's metal mast was broken at the lower section and the sail was still attached. No identifying name or number could be found on this wreck. A least depth of 36 feet at MLLW was obtained by pneumatic depth gauge. Since this wreck closely agrees with the described AWOIS Item being sought and is close (170 meters) to the charted position, it is considered to be AWOIS Item #4457. It is recommended that this wreck be charted in the position determined by the present survey as a dangerous sunken wreck with a least depth of 36 feet. The presently charted dangerous sunken wreck should be deleted from the chart. No additional field work is recommended on this AWOIS Item. One obstruction and one other wreck were found during the investigation of AWOIS Item #4457 and are addressed as follows:

a) A large oak tree trunk, 9 meters (approximately 30 feet) in length, was found in Latitude 38°53'25.97"N, Longitude 76°25'07.12"W. This obstruction was designated as contact #4457B (position #1454). This obstruction lies in prior (H-2402) depths of 45½-46½ feet. This obstruction extends approximately 3 feet off the bottom. A least depth was not determined for this obstruction. This obstruction is not presently charted. It is recommended that this obstruction not be charted. No additional field work is recommended on this obstruction.

b) A wooden sailboat partially buried in the silt was found in Latitude 38°53'25.69"N, Longitude 76°25'41.66"W. The actual length of this sailboat is unknown as only 4 meters (13 feet) of the hull is exposed above the bottom. This wreck extends 2 feet off the bottom.

This wreck was designated as contact #4457C (position #1476). This wreck lies in prior (H-2402) depths of 41-44 feet. A least depth of 37 feet at MLLW was obtained by pneumatic depth gauge. This wreck is not presently charted. It is recommended that this wreck be charted in the position determined by the present survey as a sunken wreck with a least depth of 37 feet. No additional field work is recommended on this wreck. In the narrative on this wreck in section K. of the Descriptive Report, the hydrographer speculates that this wreck may be AWOIS Item #4459, but due to the sparse information given for AWOIS Item #4459, no positive determination could be made. It is recommended that additional research be accomplished to determine if this wreck is AWOIS Item #4459.

2) AWOIS #4458, a charted nondangerous sunken wreck in Latitude 38°52'41"N, Longitude 76°24'05"W, position approximate, originated with Notice to Mariners No. 41 of 1965 and is identified as a 28-foot cabin cruiser sunk in 100 feet of water. This item was searched for by side scan sonar and echosounder. Four insignificant and one significant side scan sonar contacts were flagged. The only significant contact (#4458A) was well outside the required search area is not the item being sought. The hydrographer claimed 400% coverage was accomplished over the required search area but 200% of the coverage was lost and not recoverable. Only 200% coverage could be verified during processing and since 400% coverage was required, this item is not considered disproved. It is recommended that this nondangerous sunken wreck, AWOIS Item #4458, be retained as presently charted. Additional field work is recommended to verify or disprove the existence of this item.

Per conversation, Monzez, Rudy Sanchez, 200% coverage questionable; some lost data, can not consider disproved. M. Kenny

A significant contact was detected by side scan sonar during the investigation of AWOIS Item #4458. This contact was found well outside the assigned search area of AWOIS Item #4458 in Latitude 38°53'54.00"N, Longitude 76°24'05.11"W (position #1106). This contact was investigated and is identified as the ruins of a large wooden vessel. This wreck is not AWOIS Item #4458. This wreck is in a broken and highly deteriorated condition and is considered as an obstruction (wreckage). The dimensions of this wreck could not be determined. The shoalest point of this wreckage, the encrusted deck machinery on the broken off bow, extends 5 feet off the bottom in prior (H-2402) depths of 61-69 feet. A least depth of 59 feet at MLLW was obtained by pneumatic depth gauge on this shoalest point. This wreckage is in an area cleared by an effective depth of 61 feet by prior survey H-8523WD (1960) and was most likely in existence at the time of the survey. This conflict between the present least depth of 59 feet and the prior clearance depth 61 feet is attributed to the wire drag clearance being in one direction only and a much more accurate present survey. The present survey is adequate to

supersede the prior wire drag survey at the position of this wreckage. This wreckage is not presently charted. It is recommended that this wreckage be charted in the position determined by the present survey as a 59-foot depth with a danger curve and the label: wreckage.' No additional field work is recommended on this wreckage.

3) AWOIS #4459, a charted dangerous sunken wreck, PA, in Latitude 38°52'33"N, Longitude 76°24'48"W originated with Local Notice to Mariners No. 40 of 1972 and is identified as a 28-foot sailboat with a 38-foot mast. This item was searched for by side scan sonar and echosounder. Seventeen individual contacts were flagged and logged during this item investigation. Four of these contacts were considered significant and were investigated. The remaining thirteen contacts were considered insignificant and were not investigated. None of these contacts was AWOIS Item #4459. The side scan sonar coverage required for disproval of this item is 400% for a search radius of 1000 meters. The hydrographer claims that the 400% coverage over the assigned search area was accomplished; however, some data was not retrievable from HDAPS and was not plotted on any of the submitted field sheets. Therefore, the side scan sonar coverage is not considered to be 400% and the item is not disproved. It is recommended that the presently charted dangerous sunken wreck, PA, AWOIS Item #4459, be ~~retained~~ as presently charted. Additional field work is recommended to verify or disprove the existence of this item. Four obstructions were found during this investigation and are addressed as follows:

Do not concur See Addendum MRL

a) An old, highly deteriorated wooden vessel was found in Latitude 38°52'23.33"N, Longitude 76°25'15.99"W. This wreck was designated contact #4459C (position #1215). This wreck was found to be broken and scattered and is considered as an obstruction (wreckage). The main section of this wreck was found resting upside down and buried deep in the silt with only 11 feet of the hull being exposed. Several smaller pieces of the vessel were scattered about the bottom. The main section of the wreck extended above the bottom 2 feet and was the shoalest piece of all the wreckage. This vessel could not be identified. A least depth of 38 feet at MLLW was obtained by pneumatic depth gauge. This wreck is not presently charted. It is recommended that this wreck be charted in the position determined by the present survey as a 38-foot depth with a danger curve and the label: wreckage. No additional field work is recommended on this wreckage.

b) A large tire, such as used on heavy equipment, with a small portion of chain attached was found in Latitude 38°52'51.47"N, Longitude 76°25'25.90"W. This obstruction was designated as contact #4459D (position #1313). This tire extends one foot above the bottom in

prior (H-5501) depths of 44 feet. No least depth was taken on this obstruction. It is recommended that this submerged obstruction be assigned an AWOIS number and recorded in the AWOIS Listing but not charted as it does not pose a hazard to navigation. No additional field work is recommended on this obstruction.

c) A tree trunk partially buried in the silt, approximately 14 feet in length, was found in Latitude 38°51'47.09"N, Longitude 76°24'31.73"W. This obstruction was designated as contact #4459F (position #1226). Since this obstruction is identified as a 14-foot long tree trunk, partially buried in the bottom, it is considered to be a snag or possibly a stump. This obstruction extends 1½ feet off the bottom in prior (H-5501) depths of 54-60 feet. A least depth of 51 feet at MLLW was obtained by pneumatic depth gauge. It is recommended that this obstruction be charted in the position determined by the present survey as a 51-foot depth with a danger curve and the label: snag. No additional field work is recommended on this obstruction.

d) A deteriorated 55 gallon drum was found in Latitude 38°52'40.94"N, Longitude 76°25'18.67"W. This obstruction was designated as contact #4459G (position #1288). This drum extends approximately 2-3 feet off the bottom in prior (H-5501) depths of 42-43 feet. A least depth off 37 feet at MLLW was obtained by pneumatic depth gauge. It is recommended that this obstruction not be charted. No additional field work is recommended on this obstruction. The hydrographer's recommendation to add this obstruction to the AWOIS List for a period not to exceed 5 years (because of the natural deterioration of the drum) may be valid and should be considered.

4) AWOIS #4460, a charted dangerous sunken wreck, PA, with a mast in Latitude 38°51'32"N, Longitude 76°25'23"W originated with Local Notice to Mariners No. 48 of 1979 and was identified as a sunken sailboat with mast and antenna visible. This item was searched for by side scan sonar and echosounder. Five individual contacts were flagged and logged during this item investigation. Only one of these contacts was considered significant and was investigated. One other contact was found incidental to BATHYSCAN operations and was also investigated. The remaining four contacts were considered insignificant and were not investigated. None of the contacts was AWOIS Item #4460. The side scan sonar coverage required for disproval of this item is 400%, 200% for a search radius of 750 meters and 200% for a search radius of 1000 meters. The hydrographer attempted 300% coverage by a system of north-south lines which lacked coverage slightly at the edges of the search radius. Coverage is considered as 200% complete in the north-south scheme of lines. The additional coverage of 100% was obtained by running a system of east-west lines.

Adequate 400% coverage is only obtained when two search patterns, run perpendicular to each other, each achieve 200% coverage over a common area. Therefore, the criteria for item disproval by side-scan sonar has not been met and this AWOIS Item is not considered disproved. It is recommended that this dangerous sunken wreck, PA, AWOIS Item #4460, be ~~retained~~ as presently charted. Additional field work is recommended to verify or disprove the existence of this item. The two significant contacts found and investigated during the search for this AWOIS item are addressed as follows:

Do not concur See Addendum MRK

a) A tree stump, 5 feet long, was found lying on its side in Latitude 38°51'21.83"N, Longitude 76°25'38.92"W. This tree stump was designated as contact #4460A (position #1489). Since this obstruction is a tree trunk, it is considered to be a snag. This tree trunk extends 1½ feet off the bottom in prior (H-5501) depths of 38-40 feet. A least depth was not taken on this item. This snag or stump is not considered to be a hazard to surface navigation. It is recommended that this snag not be charted. It is recommended that this obstruction be entered into the AWOIS data base. No additional field work is recommended on this obstruction.

b) A cabin cruiser, 23 feet in length, was found lying upright on its keel in Latitude 38°51'56.55"N, Longitude 76°26'12.30"W. This wreck was designated as contact #4460B (position #1524). This vessel had the homeport of Cape St. Claire, MD stenciled on the stern and the 1983 Maryland registration number 2786 AA on the bow. This wreck extends approximately 7 feet off the bottom in prior (H-5501) depths of 36-38 feet. A least depth of 28 feet at MLLW was obtained by pneumatic depth gauge. This wreck is not presently charted. It is recommended that this wreck be charted in the position determined by the present survey as a dangerous sunken wreck with a least depth of 28 feet. No additional field work is recommended on this wreck.

5) AWOIS #4461, a charted dangerous sunken wreck, PA, in Latitude 38°50'00"N, Longitude 76°24'00"W, position approximate, originated with Local Notice to Mariners No. 44 of 1972 and is identified as a 24-foot sailboat with a 30-foot mast sunk in approximately 100 feet of water. This item was searched for by side-scan sonar and echosounder. Ten contacts were flagged and logged during this item investigation. Three of these flagged contacts were on one target which was considered significant by the hydrographer and later investigated. The remaining contacts were considered insignificant and were not investigated. One contact which was not flagged or logged by the hydrographer was considered significant during processing. None of the contacts were considered to be AWOIS Item #4461. It is

possible that the contact flagged during processing is the item, but this cannot be determined without further investigation. The side scan sonar coverage required for disproval is 400%, 200% for an assigned search radius of 750 meters and 200% for an assigned search radius of 1000 meters. The hydrographer attempted 400% coverage by north-south lines (300% coverage) which lacked slightly at the edges of the search radius (considered 200% complete) and east-west lines (100% coverage). Adequate 400% coverage is only obtained when two search patterns, run perpendicular to each other, each achieve 200% scanning coverage over a common area. Therefore, the criteria for item disproval has not been met and this item is not considered disproved. It is recommended that this dangerous sunken wreck, PA, AWOIS Item #4461, be ~~retained~~ as presently charted. Additional field work is recommended to verify or disprove the existence of this item. The one significant contact investigated by the hydrographer and the one contact flagged during processing are addressed as follows:

Do not concur
See Addendum
MRK

a) A wooden cabin cruiser, 36-38 feet in length, was found intact and lying upright in Latitude 38°49'42.71"N, Longitude 76°23'40.69"W. This wreck was designated as contact #4461A (position #1166). The shoalest point on this wreck extends 12 feet off the bottom in approximately 80 feet of water. A least depth of 67 feet at MLLW was obtained by pneumatic depth gauge. This wreck is not presently charted. It is recommended that this wreck be charted in the position determined by the present survey as a nondangerous sunken wreck with a least depth of 67 feet. No additional field work is recommended on this wreck.

b) A contact which rises approximately 3½ feet above the bottom in prior (H-5501) depths of 67-69 feet was evident on the side scan sonargrams for the investigation of AWOIS Item #4461. This contact is located in approximately Latitude 38°49'41.26"N, Longitude 76°24'30.57"W. This contact was not investigated and is unidentified. This contact has the appearance of a wreck or wreckage on the sonargrams. It is recommended that this contact be charted in the approximate position determined by the present survey as a dangerous submerged obstruction, PA (±100 meters) with a label: (63 ft rep, 1987). Additional field work is recommended to verify or disprove this obstruction and, if found, to identify and obtain an accurate position and least depth.

b. Aids To Navigation

Four fixed aids to navigation are listed in the Descriptive Report (Appendix III. - CONTROL). These four fixed aids to navigation were used for control stations. No floating aids to navigation were located by this survey.

8. COMPLIANCE WITH INSTRUCTIONS

The compliance of this survey with the Project Instructions was only considered in regard to deficiencies which impact accuracy, adequacy, interpretation, or the charting recommendations. These deficiencies are noted in sections 4. and 7. of this report and as follows:

a. Datum Ticks were not added to the field sheets as required by section 3.1.1. and Change #1.

b. There is no statement in the Descriptive Report nor any data in the survey records that indicate that the control stations used were recovered as required by section 3.1.2.

c. Numerous flagged side-scan sonar contacts are not plotted on the side-scan sonar coverage/contact overlays. Section 7.4.4.2. of the Project Instructions requires that all flagged contacts are to be plotted. Additionally the plotted contacts should be labeled with appropriate descriptive notes.

d. No side-scan sonar confidence checks were noted on the sonargrams. Section 7.11. refers to the PROVISIONAL SIDE SCAN SONAR MANUAL. The PROVISIONAL SIDE SCAN SONAR MANUAL, section 1.2.6., specifies the necessity and recommended frequency of confidence checks.

e. AWOIS Items #4458, #4459, #4460, and #4461 were not found and present survey investigations are incomplete. Four hundred percent (400%) side-scan sonar coverage is required for disproval as specified in the survey requirements section of the AWOIS Listing for each item. As specified in section 1.1. of the Project Instructions, the purpose of this project is to either verify or disprove the assigned items. A discussion with the program office (N/CG241 - Operations) in Rockville, MD. revealed the coverage requirements to be 400% over a 750-meter radius circle if the item was not detected. The second 200% of coverage was to be run normal to the initial 200% and be extended to a 1000-meter radius circle. It is assumed that the intent of the program office was misunderstood by the hydrographer. The documentation by the program office to support their intent was unclear.

9. ADDITIONAL FIELD WORK

This is an adequate side-scan sonar survey for the AWOIS Items resolved by this survey. Additional field work is addressed in section 7.a. of this report.

Frank L. Saunders
Cartographic Technician
Verification of Field Data

Maurice B. Hickson, III
Cartographer
Evaluation and Analysis

for R. G. Sanechi
Roy G. Cram
Supervisory Cartographic
Technician
Verification Check

INSPECTION REPORT
FE-305SS

The data that make up this Side Scan Sonar survey have been inspected to gain insight into its overall completeness regarding survey coverage, presentation of survey results, and the verification or disproval of charted data. This survey, except as noted in the Evaluation Report, is considered complete and adequate to meet National Ocean Service standards. Processing is considered complete. The survey records comply with NOS requirements except as noted in the Evaluation Report.

Inspection

R. D. Sanocki
Chief, Hydrographic Surveys
Processing Section
Hydrographic Surveys Branch

William A. Wert, LCDR, NOAA
Chief, Hydrographic Surveys Branch

Approved September 29, 1988

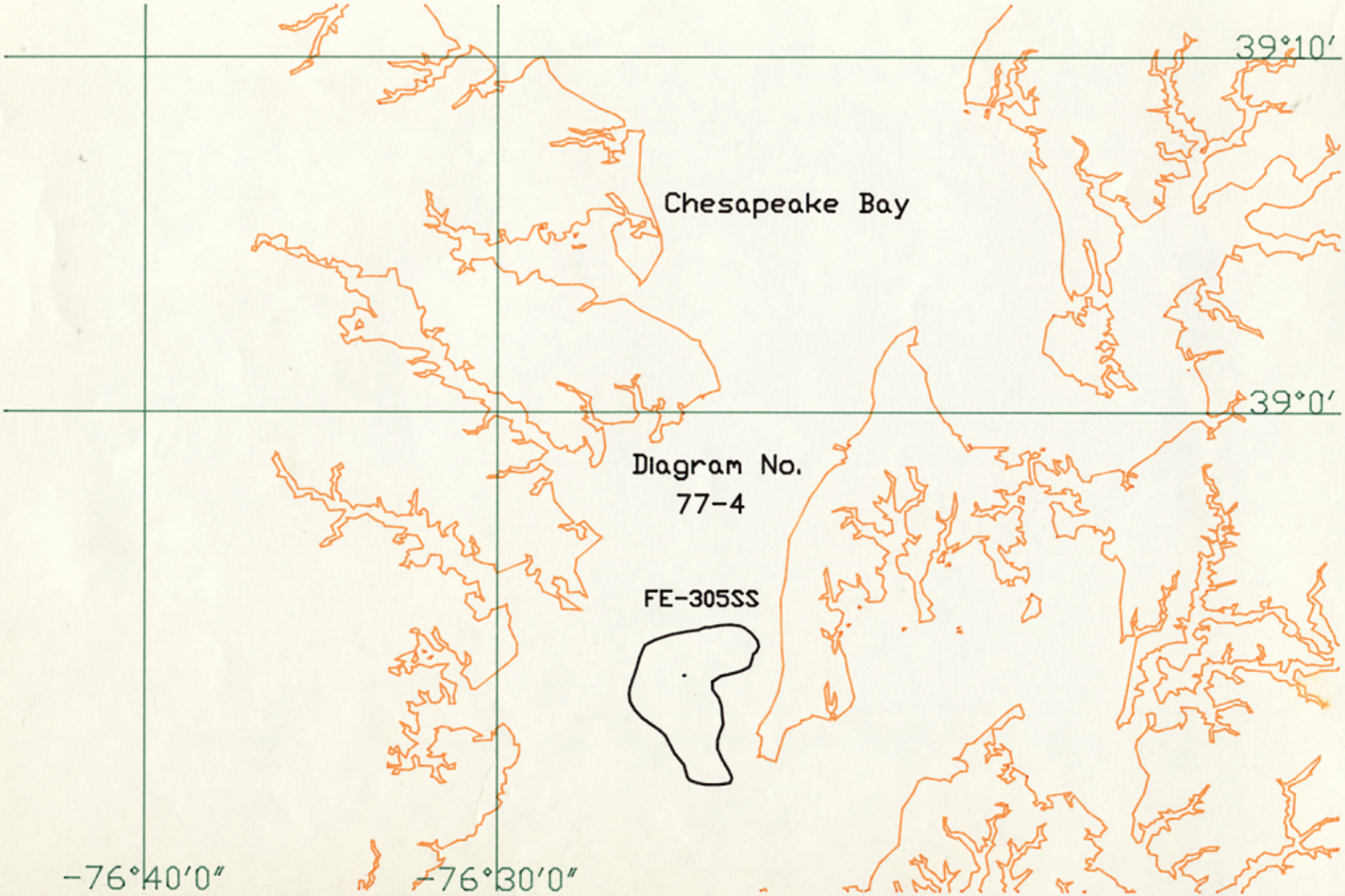
Ray E. Moses, RADM, NOAA
Director, Atlantic Marine Center

PA, at latitude 38°51'32"N, longitude 76°25'23"W be removed from the chart.

AWOIS Item No. 4461

This item is reported to be a 24-foot sailboat with a 30-foot mast. Review of the search requirements showed the initial requirement for 400-percent side scan sonar coverage to be unnecessary; 200-percent coverage is sufficient. As stated in the Evaluation Report, 200-percent coverage was achieved with two significant contacts detected in the search area. It is recommended that the dangerous sunken wreck, PA, at latitude 38°50'00"N, longitude 76°24'00"W be removed from the chart, and the new items be charted as recommended by the evaluator in sections 7.a.5.a. and b.

cc:
~~N/CG22x3 - Danley~~
MOA23 - Wert


39°10′
Chesapeake Bay
39°0′
Diagram No.
77-4
FE-305SS
-76°40′0″
-76°30′0″

76° 26′ 76° 24′ 76° 22′

38° 54′ 38° 54′

59 Obstr (wreckage)
Silt

36 Wk

37 Wk
Silt

subm obstr (tree trunk, extends 3 ft off bottom)

subm obstr (large tire, extends 1 ft off bottom)

37 Obstr (55 gal drum)

38 Obstr (wreckage)
Silt

38° 52′ 38° 52′

28 Wk

51 Obstr (snag)

subm snag (extends 1 1/2 ft off bottom)

FE-305SS
MARYLAND
CHESAPEAKE BAY
KENT POINT TO THOMAS POINT SHOAL
28 APRIL TO 14 SEPT 1987
SCALE = 1:40,000
N A 1983 DATUM
SOUNDINGS IN FEET AT MLLW
RESULTS OF THE INVESTIGATIONS OF
AWOIS ITEMS 4457, 4458, 4459, 4460, & 4461

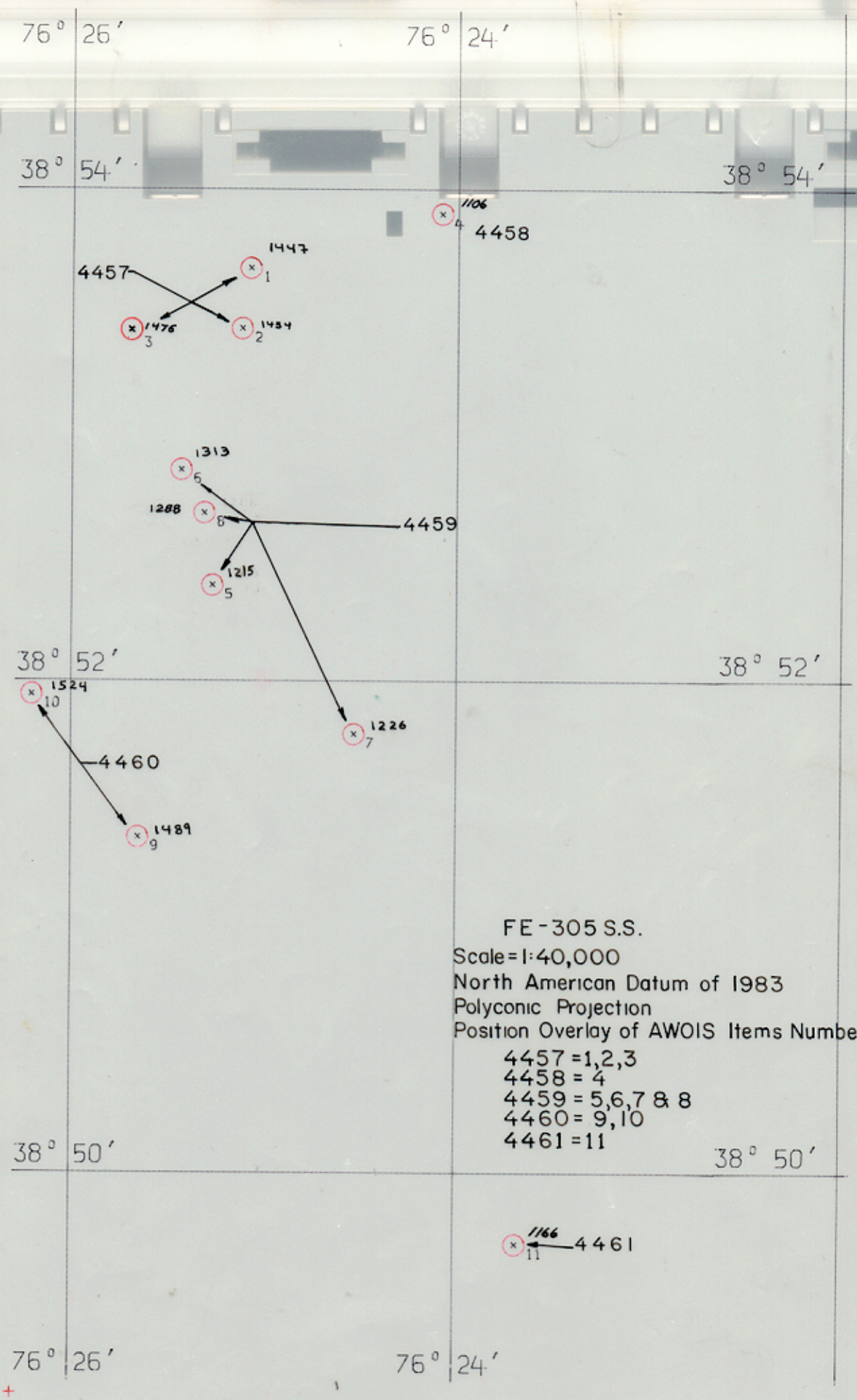
76° 26′
N A 1927 Datum
3/30/88 MBH
RGR
38°50′

38° 50′ 38° 50′

Obstr

67 Wk

76° 26′ 76° 24′ 76° 22′



FE-305 S.S.
Scale = 1:40,000
North American Datum of 1983
Polyconic Projection
Position Overlay of AWOIS Items Numbers:

4457 = 1,2,3
4458 = 4
4459 = 5,6,7 & 8
4460 = 9,10
4461 = 11

76° 26′ 76° 25′ 76° 24′

38° 54′ 38° 54′

76° 25′ 00″

NAD 27 38° 54′ 00″

3/3/1988 F.L.S.

✓ L.G.C.

102

36 Wk (24 ft long)

37 Wk

Silt

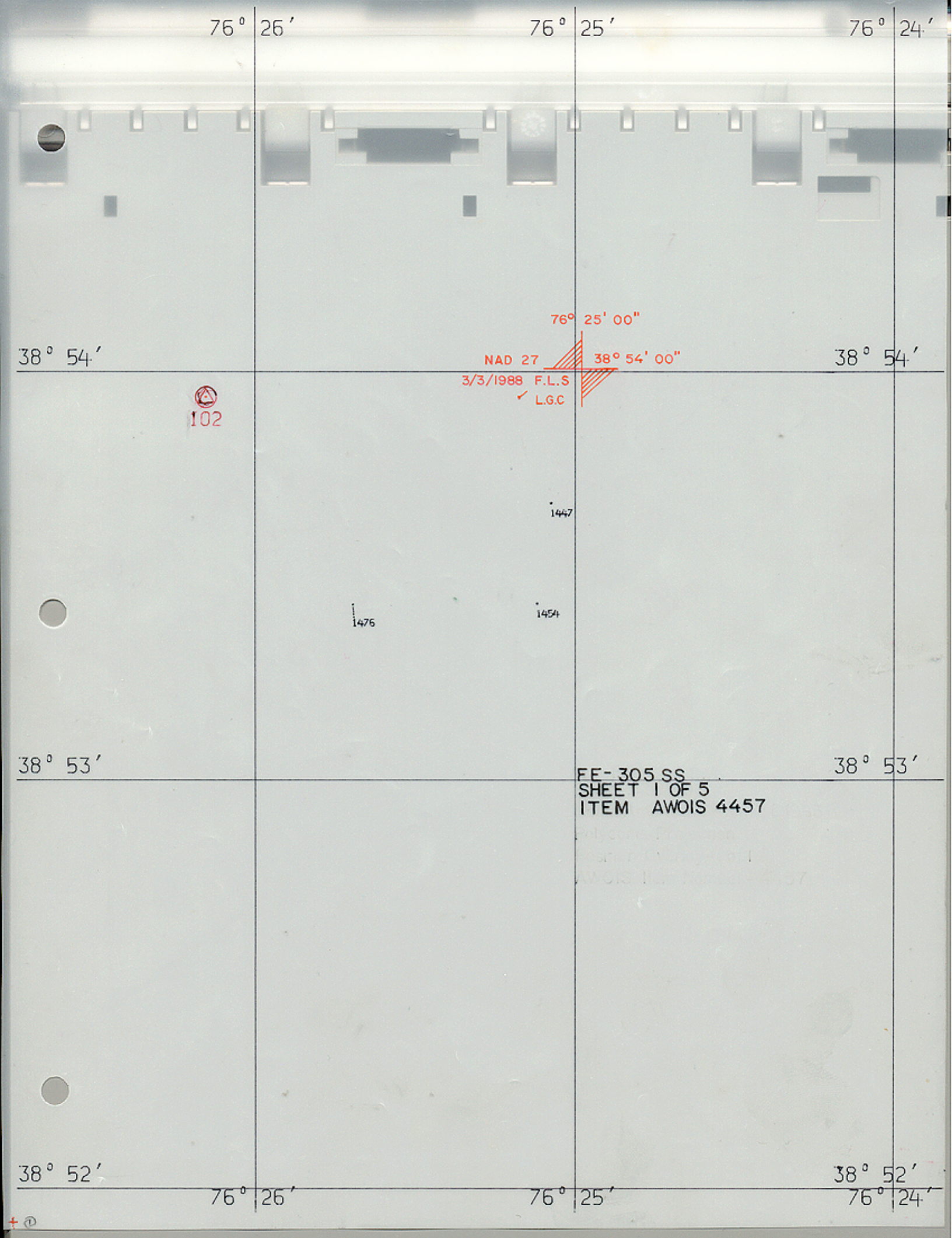
o subm obstr (tree trunk 29ft long 3ft off bottom)

38° 53′ 38° 53′

FE-305 SS
MARYLAND
CHESAPEAKE BAY
KENT POINT TO THOMAS POINT SHOAL
28 APRIL TO 14 SEPT 1987
SCALE 1:20000
SOUNDINGS IN FEET AT MLLW
SHEET 1 OF 5
ITEM AWOIS 4457

38° 52′ 38° 52′

76° 26′ 76° 25′ 76° 24′


76° 26′
76° 25′
76° 24′
38° 54′
38° 53′
38° 52′
76° 25' 00"
38° 54' 00"
NAD 27
3/3/1988 F.L.S
L.G.C
102
1447
1476
1454
FE-305 SS
SHEET 1 OF 5
ITEM AWOIS 4457

76° 25′ 76° 24′ 76° 23′

76° 24′ 00″

38° 55′ 38° 55′

NAD 27 38° 55′ 00″

3/3/1988 F.L.S

L.G.C

38° 54′ 38° 54′

Silt

59 obstr (wreckage)

38° 53′ 38° 53′

FE-305 SS
MARYLAND
CHESAPEAKE BAY
KENT POINT TO THOMAS POINT SHOAL
28 APRIL TO 14 SEPT 1987
SCALE 1:20000
SOUNDINGS IN FEET AT MLLW
SHEET 2 OF 5
ITEM AWOIS 4458

76° 25′ 76° 24′ 76° 23′

76° 25′ 76° 24′ 76° 23′

76° 24′ 00″

38° 55′ NAD 27 38° 55′ 00″ 38° 55′

3/3/1988 F.L.S

✓ L.G.C.

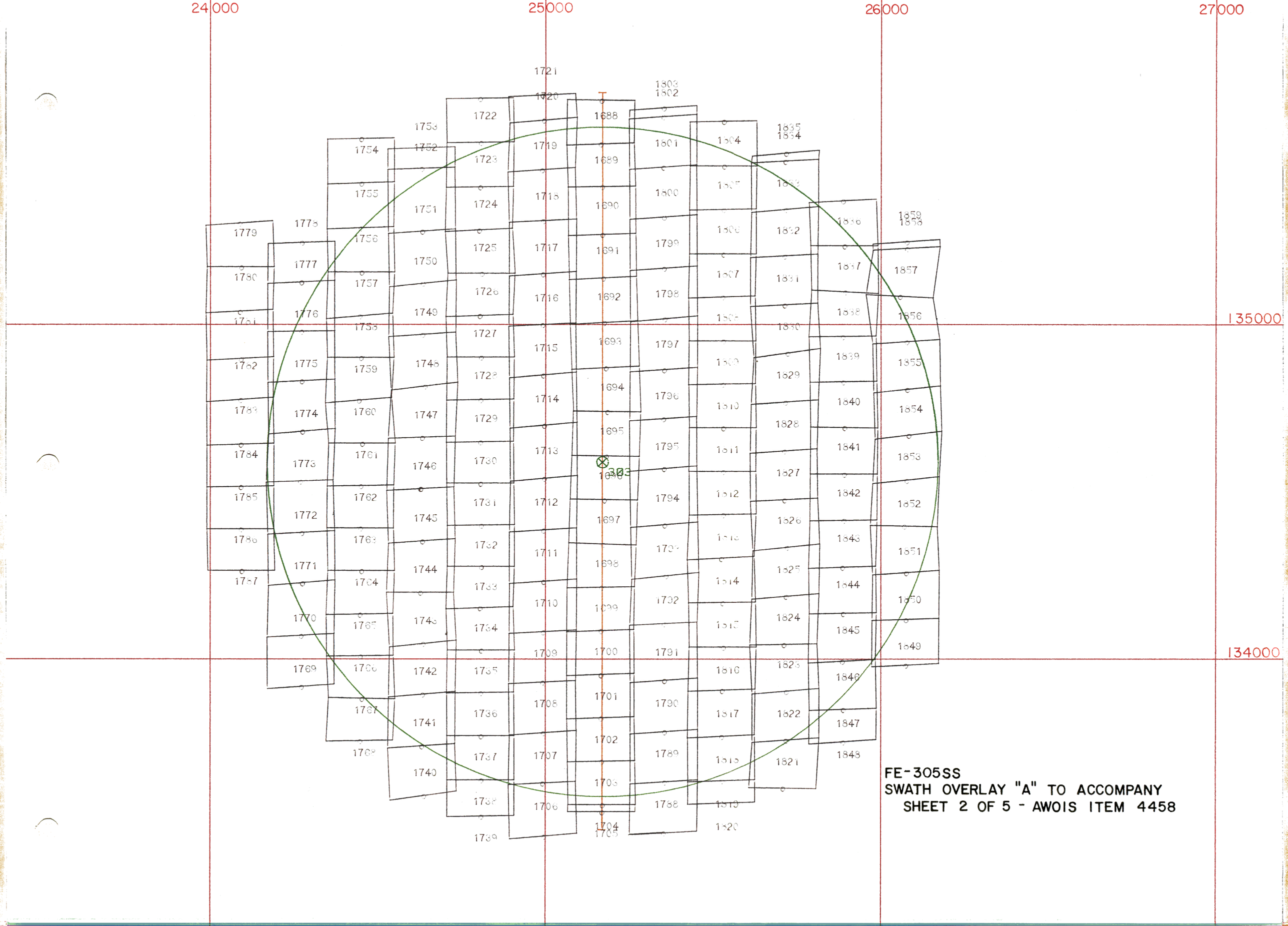
38° 54′ 38° 54′

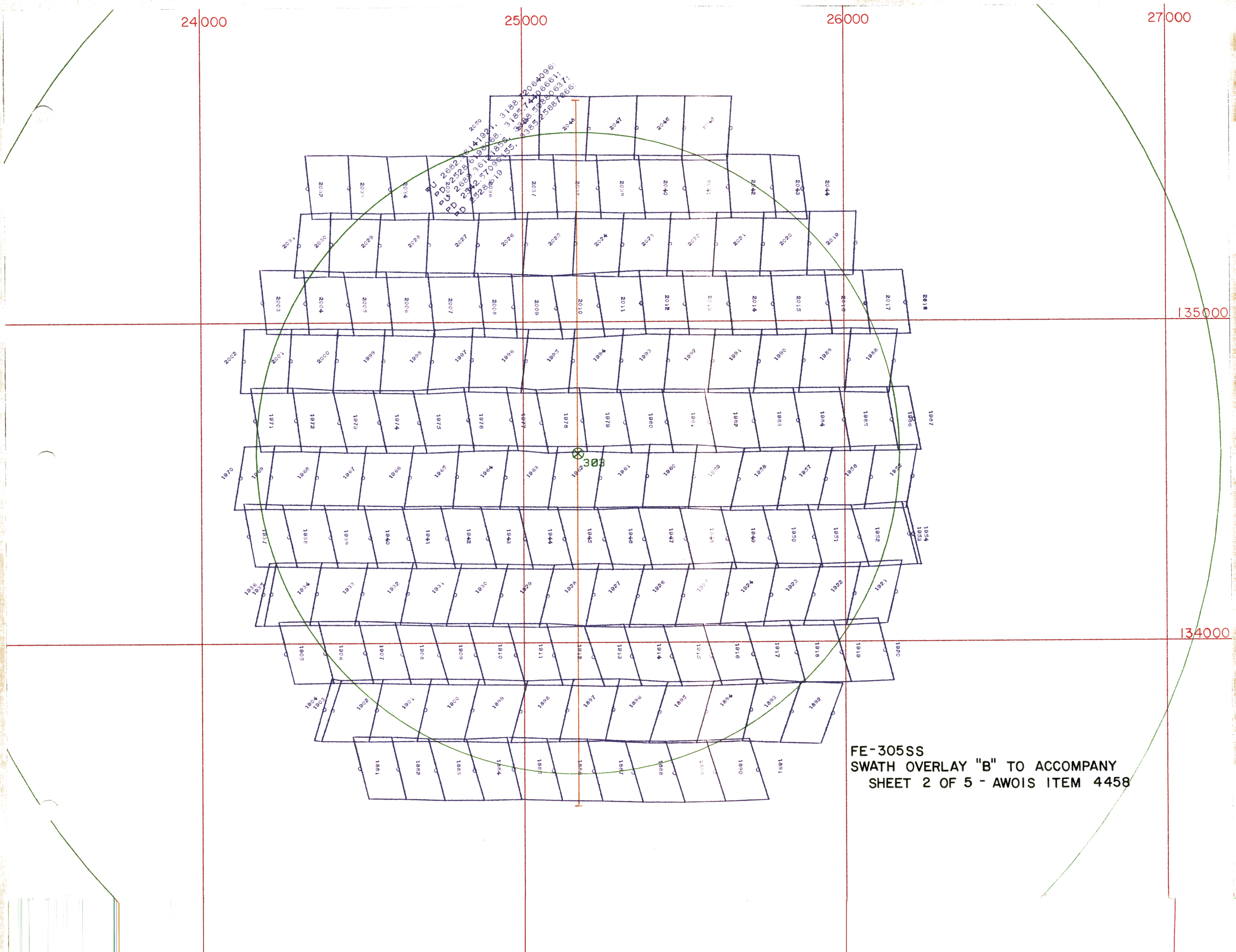
1106

38° 53′ 38° 53′

FE-305 SS
SHEET 2 OF 5
ITEM AWOIS 4458

76° 25′ 76° 24′ 76° 23′


24000
25000
26000
27000
135000
134000
FE-305SS
SWATH OVERLAY "A" TO ACCOMPANY
SHEET 2 OF 5 - AWOIS ITEM 4458



FE-305SS
SWATH OVERLAY "B" TO ACCOMPANY
SHEET 2 OF 5 - AWOIS ITEM 4458

76° 26′ 76° 25′ 76° 24′

38° 53′ 38° 53′

76° 25′ 00″

NAD 27 38° 53′ 00″

3/3/1988 F.L.S

✓ L.G.C

© subm obstr (tire 1 ft off bottom)

37 obstr (55 gallon drum)

Silt

38 obstr (wreckage)

38° 52′ 38° 52′

51 obstr (snag)

FE-305 SS
MARYLAND
CHESAPEAKE BAY
KENT POINT TO THOMAS POINT SHOAL
28 APRIL TO 14 SEPT 1987
SCALE 1:20000
SOUNDINGS IN FEET AT MLLW
SHEET 3 OF 5
ITEM AWOIS 4459

38° 51′ 38° 51′

76° 26′ 76° 25′ 76° 24′

76° 26′ 76° 25′ 76° 24′

38° 53′ 38° 53′

76° 25′ 00"

NAD 27 38° 53′ 00"

3/3/1988 F.L.S

L.G.C.

1313

1288

1215

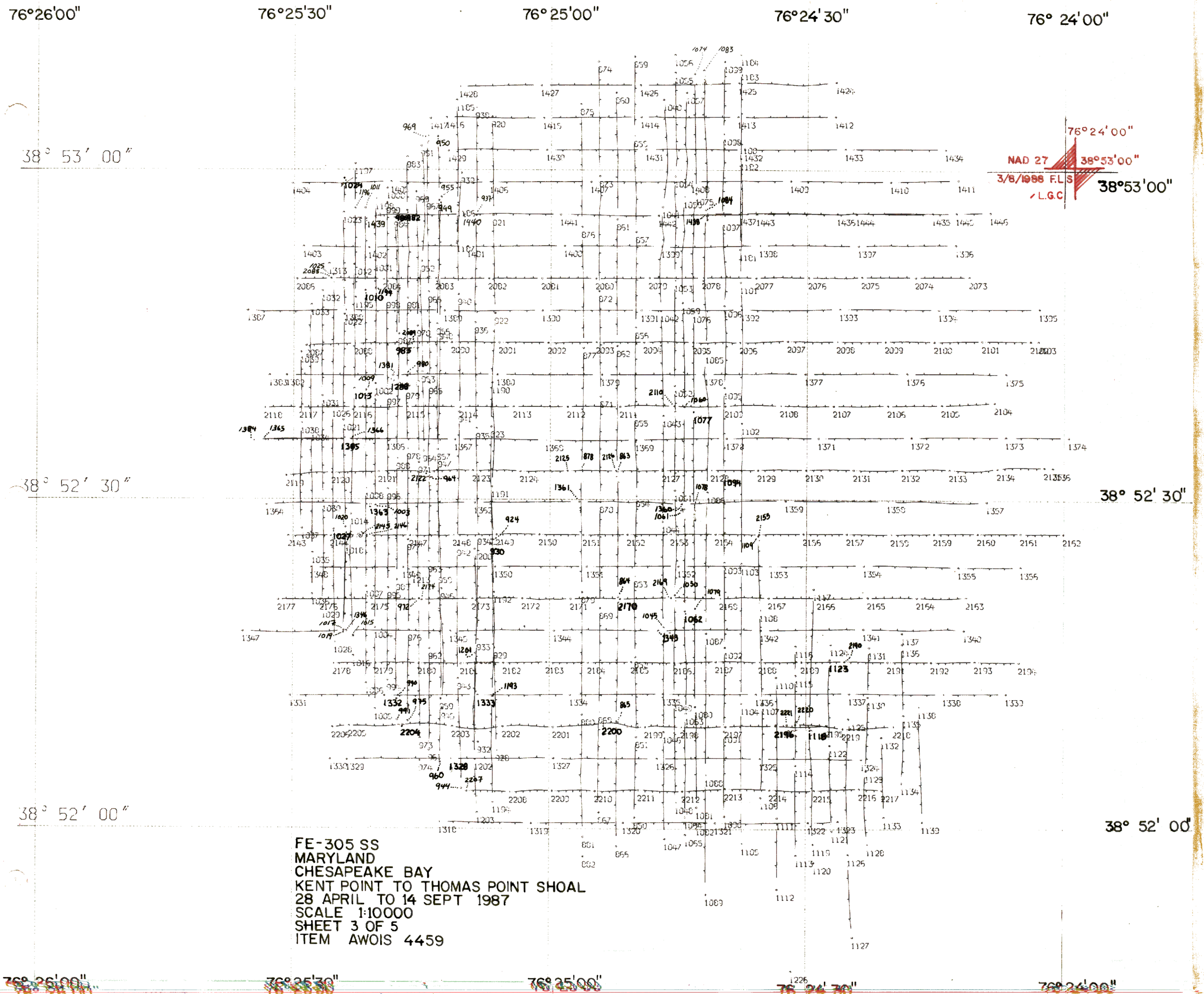
38° 52′ 38° 52′

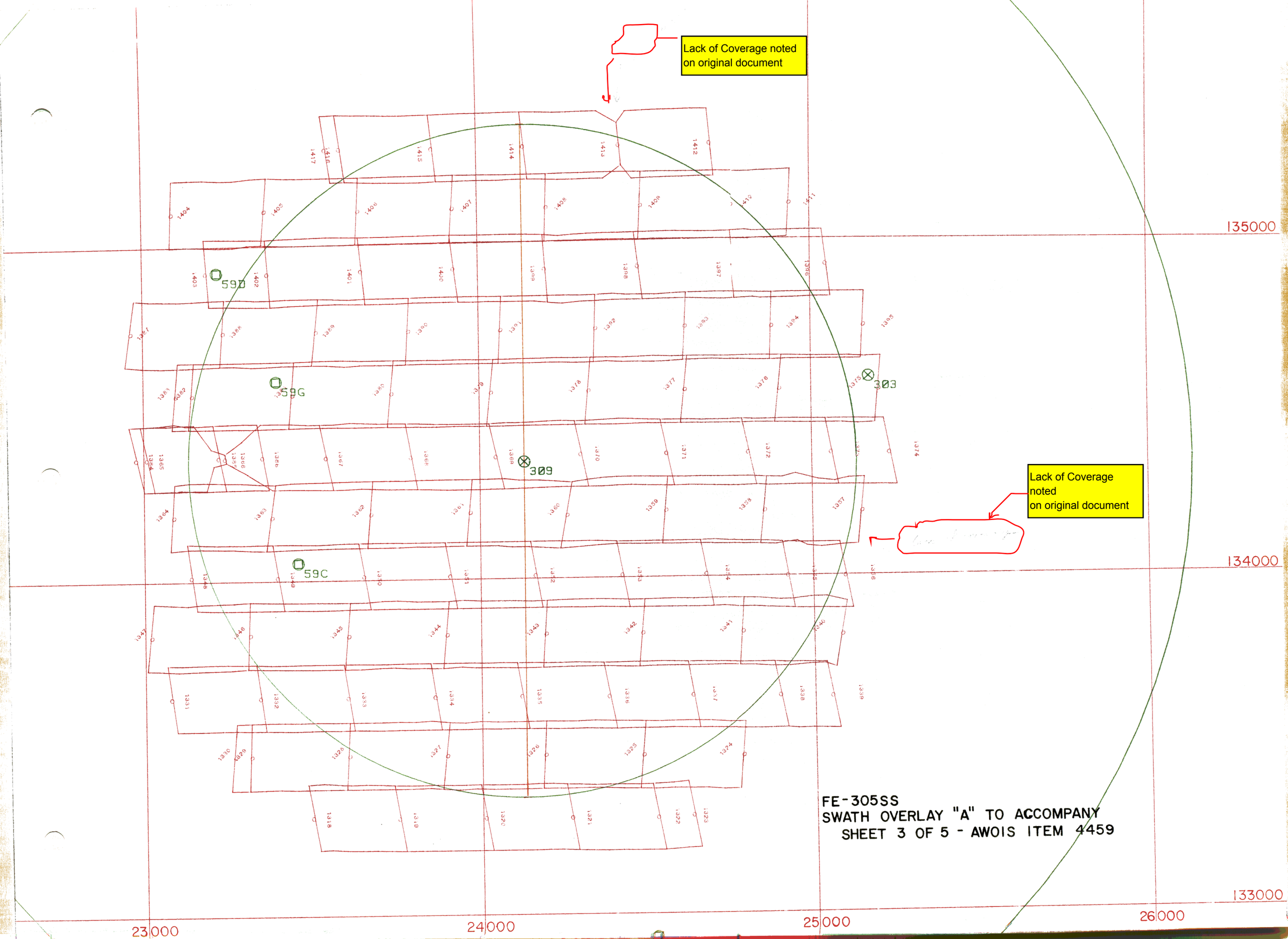
1226

FE-305 SS
SHEET 3 OF 5
ITEM AWOIS 4459

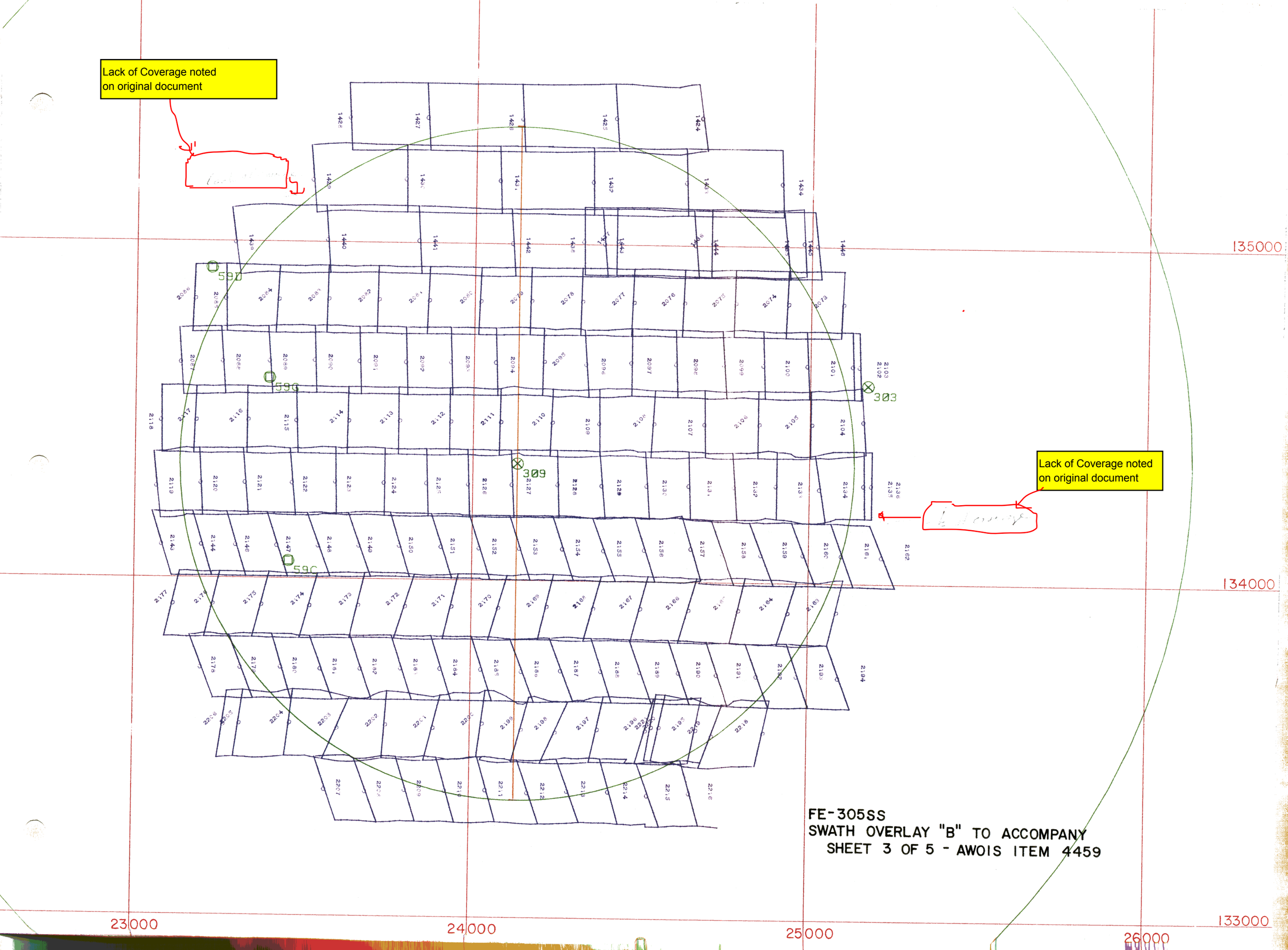
38° 51′ 38° 51′

76° 26′ 76° 25′ 76° 24′


76°26'00"
76°25'30"
76° 25'00"
76°24' 30"
76° 24'00"
38° 53' 00"
38° 52' 30"
38° 52' 00"
76°24'00"
NAD 27
38°53'00"
3/8/1988 F.L.S
/L.G.C
38°53'00"
FE-305 SS
MARYLAND
CHESAPEAKE BAY
KENT POINT TO THOMAS POINT SHOAL
28 APRIL TO 14 SEPT 1987
SCALE 1:10000
SHEET 3 OF 5
ITEM AWOIS 4459



FE-305SS
SWATH OVERLAY "A" TO ACCOMPANY
SHEET 3 OF 5 - AWOIS ITEM 4459

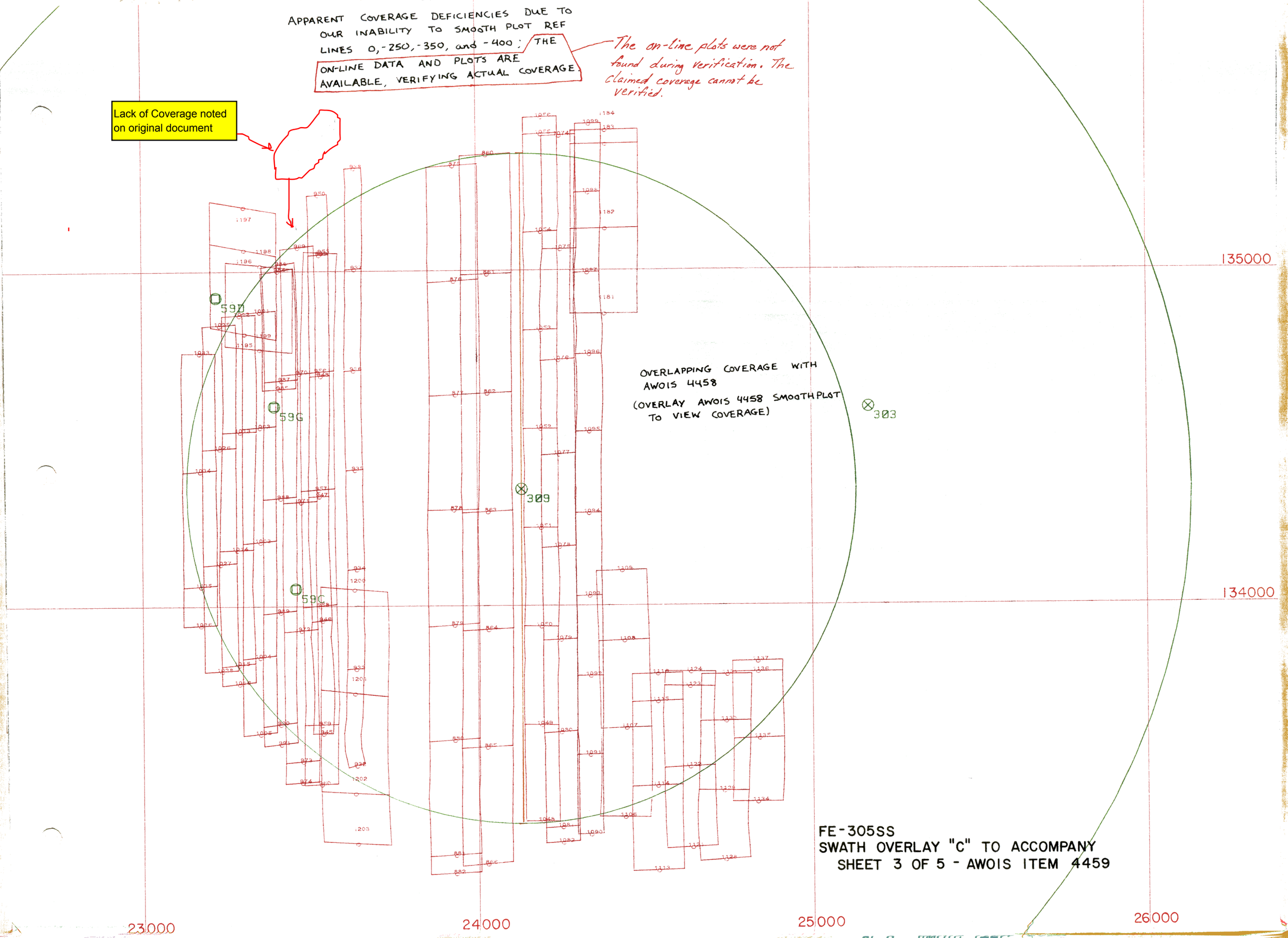


FE-305SS
SWATH OVERLAY "B" TO ACCOMPANY
SHEET 3 OF 5 - AWOIS ITEM 4459

APPARENT COVERAGE DEFICIENCIES DUE TO OUR INABILITY TO SMOOTH PLOT REF LINES 0, -250, -350, and -400; THE ON-LINE DATA AND PLOTS ARE AVAILABLE, VERIFYING ACTUAL COVERAGE.

The on-line plots were not found during verification. The claimed coverage cannot be verified.

Lack of Coverage noted on original document



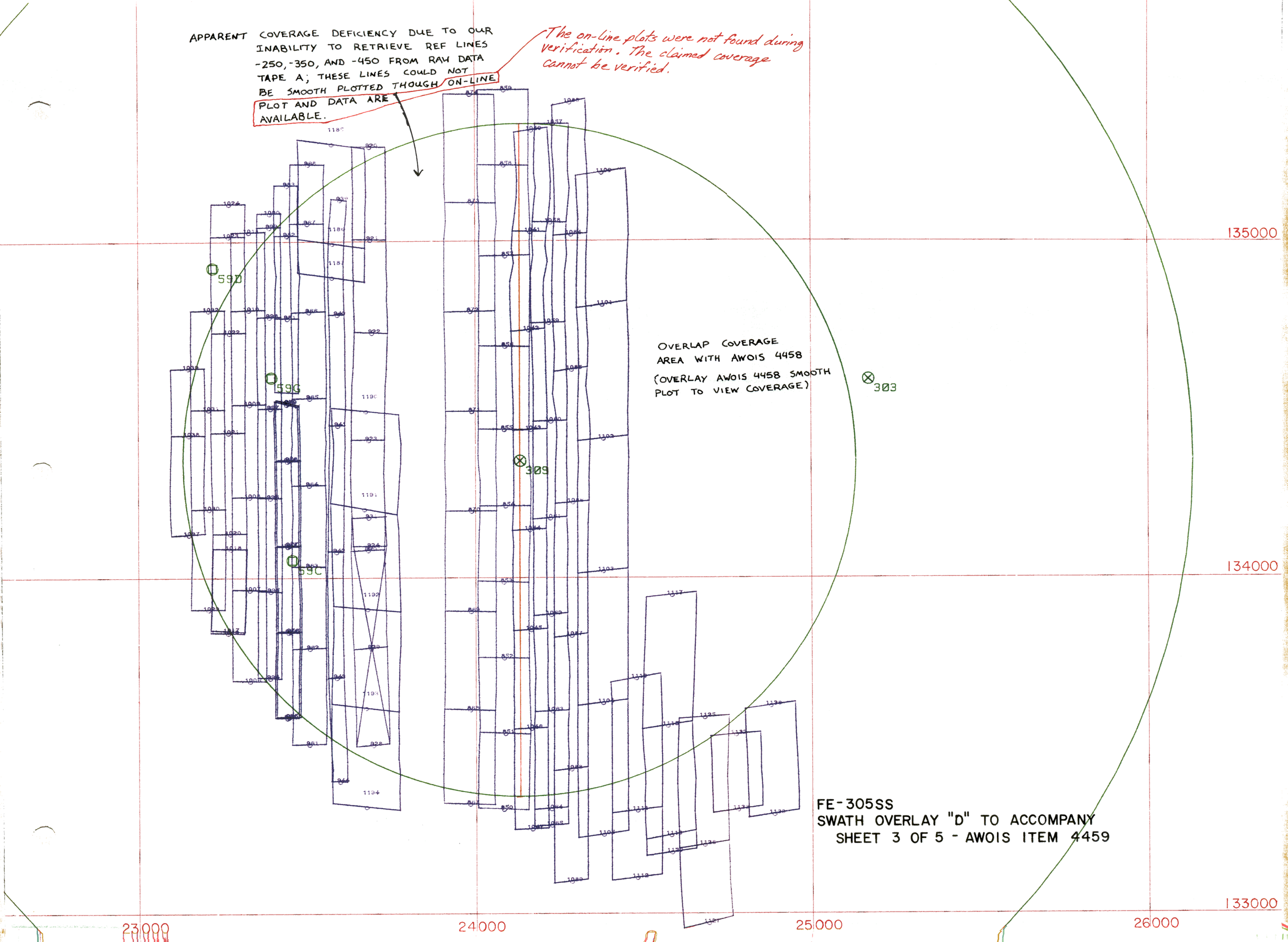
OVERLAPPING COVERAGE WITH AWOIS 4458

(OVERLAY AWOIS 4458 SMOOTH PLOT TO VIEW COVERAGE)

FE-305SS
SWATH OVERLAY "C" TO ACCOMPANY
SHEET 3 OF 5 - AWOIS ITEM 4459

APPARENT COVERAGE DEFICIENCY DUE TO OUR INABILITY TO RETRIEVE REF LINES -250, -350, AND -450 FROM RAW DATA TAPE A; THESE LINES COULD NOT BE SMOOTH PLOTTED THOUGH ON-LINE PLOT AND DATA ARE AVAILABLE.

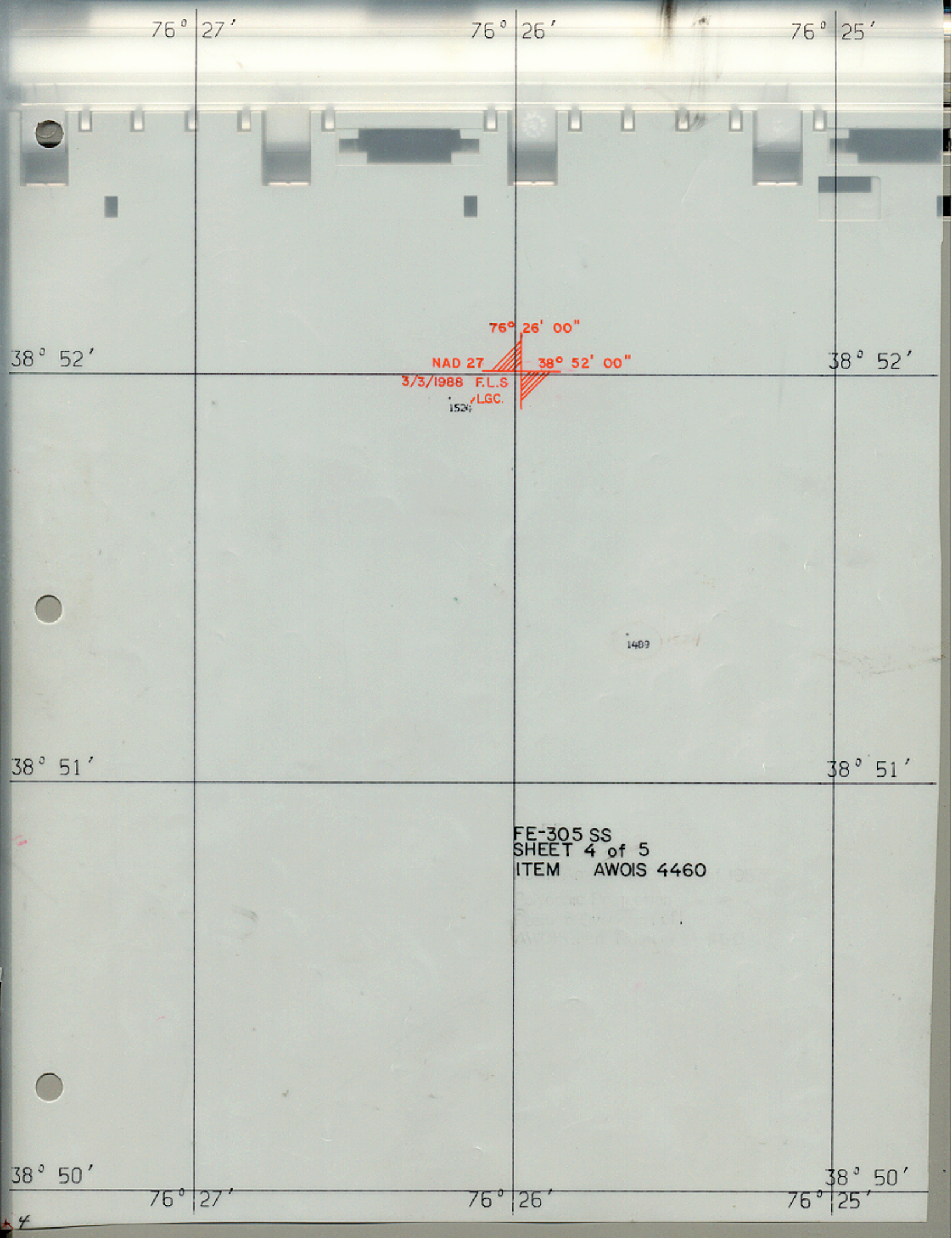
The on-line plots were not found during verification. The claimed coverage cannot be verified.

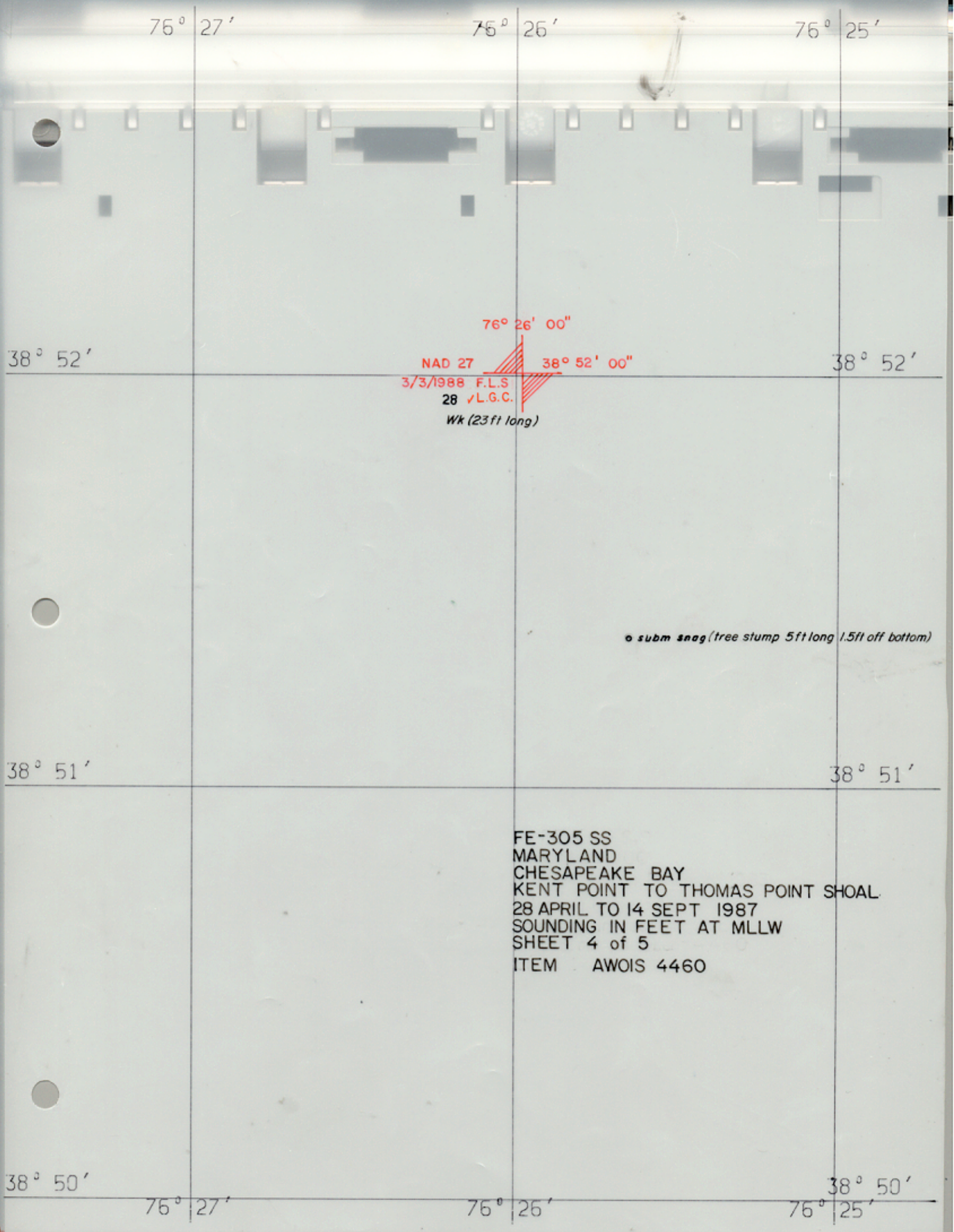


OVERLAP COVERAGE AREA WITH AWOIS 4458

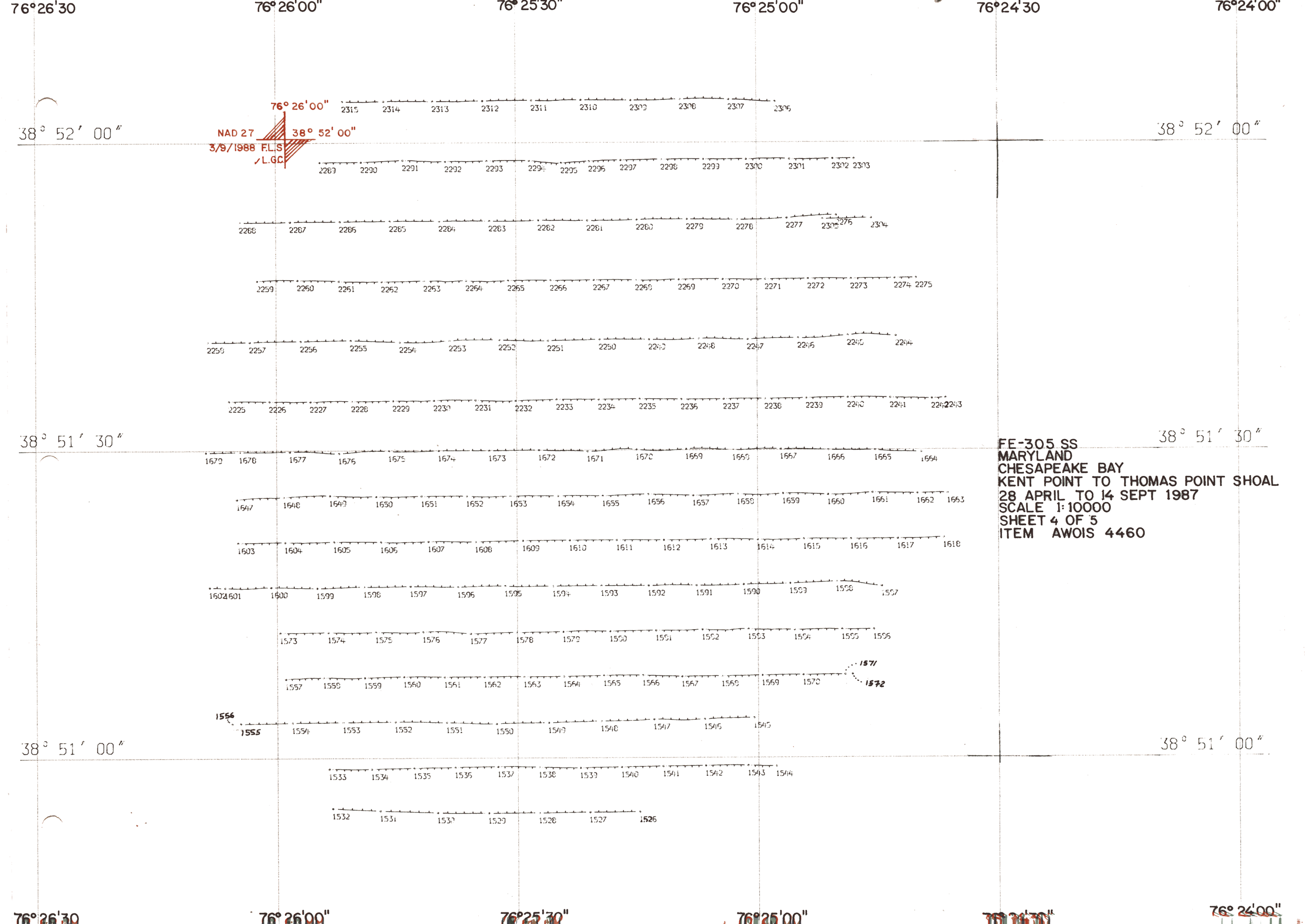
(OVERLAY AWOIS 4458 SMOOTH PLOT TO VIEW COVERAGE)

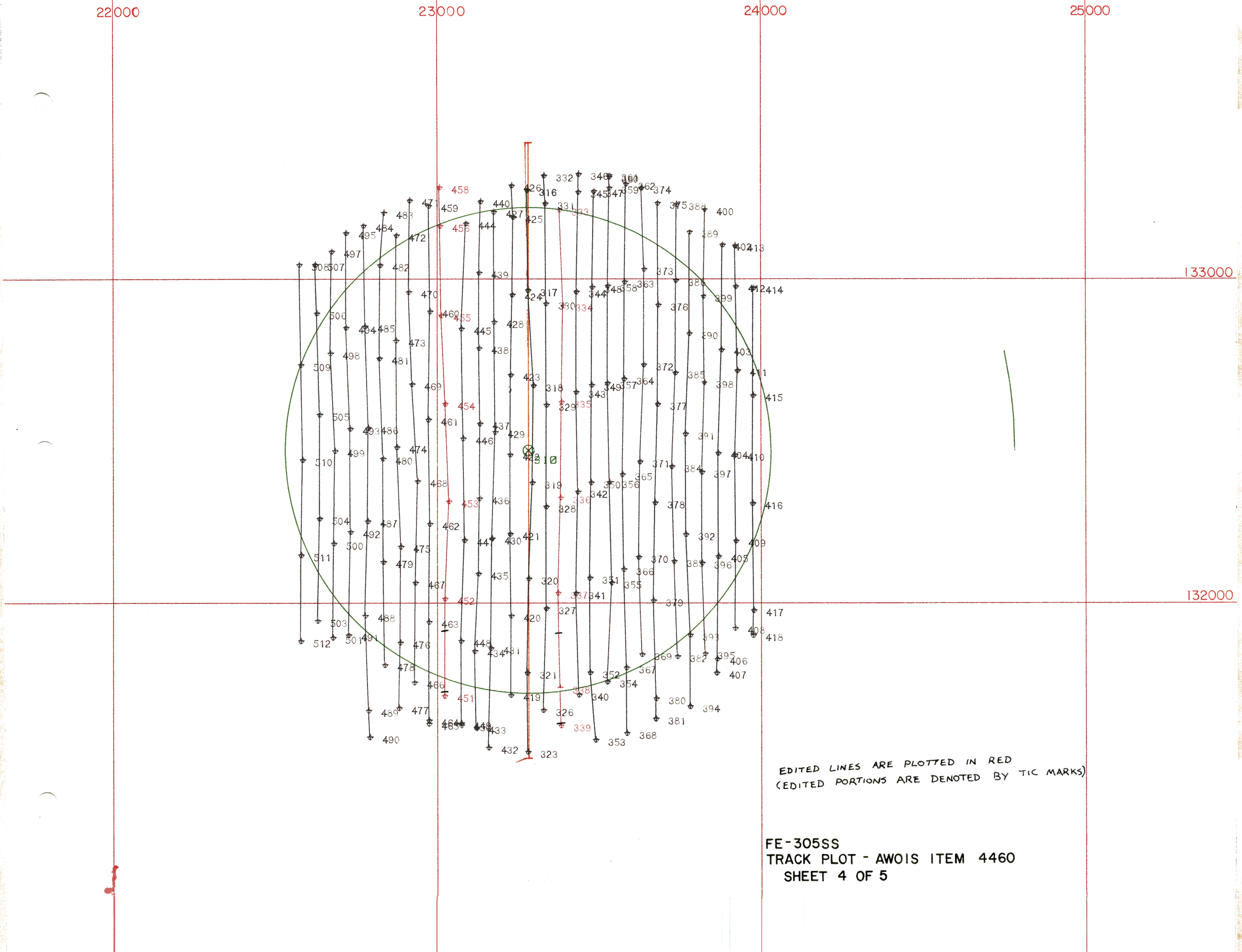
FE-305SS
SWATH OVERLAY "D" TO ACCOMPANY
SHEET 3 OF 5 - AWOIS ITEM 4459


76° 27′
76° 26′
76° 25′
38° 52′
38° 51′
38° 50′
76° 26′ 00"
NAD 27
38° 52′ 00"
3/3/1988 F.L.S
LGC.
1524
1489
FE-305 SS
SHEET 4 of 5
ITEM AWOIS 4460



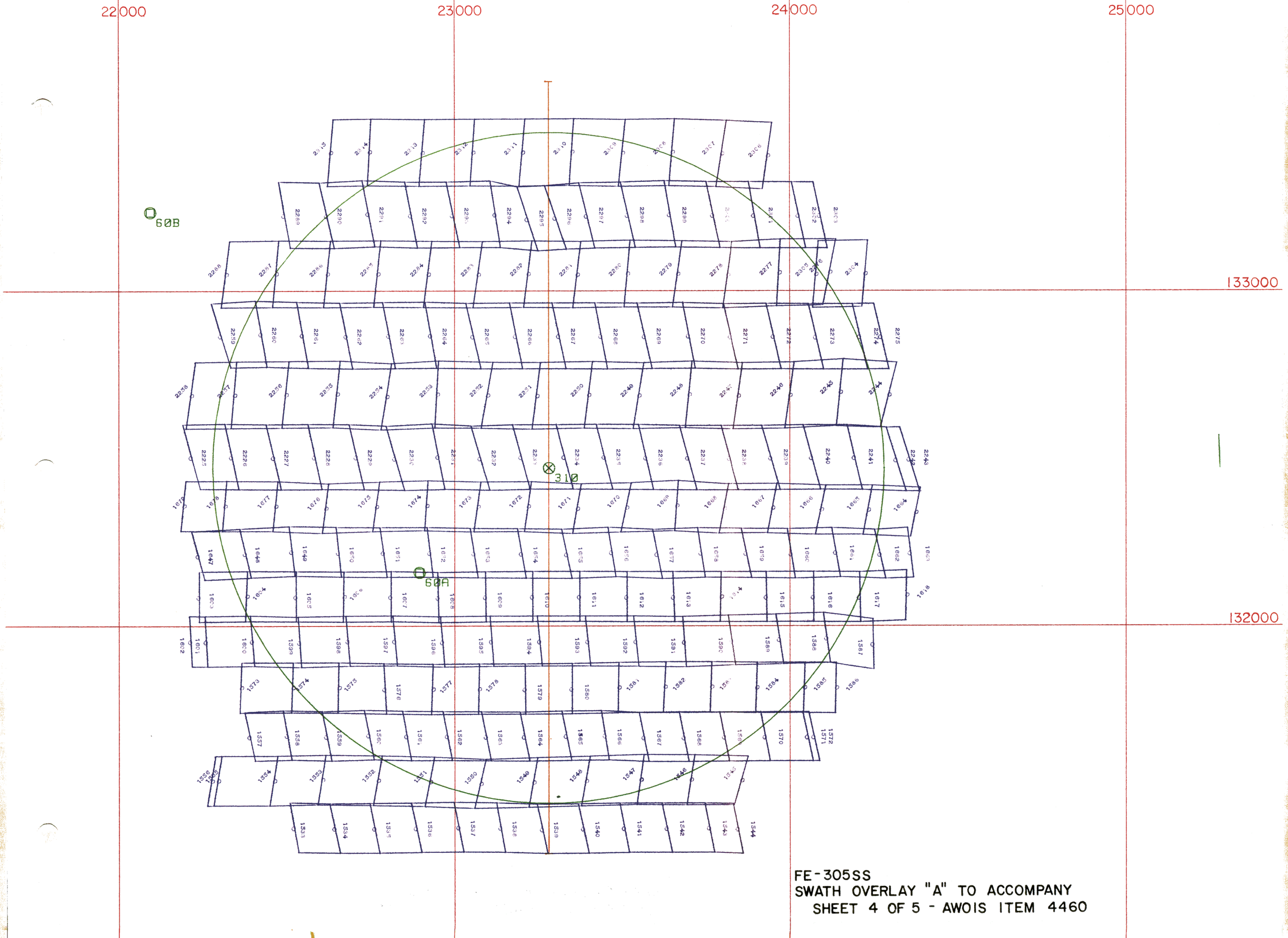
FE-305 SS
MARYLAND
CHESAPEAKE BAY
KENT POINT TO THOMAS POINT SHOAL
28 APRIL TO 14 SEPT 1987
SOUNDING IN FEET AT MLLW
SHEET 4 of 5
ITEM AWOIS 4460


76° 26'30
76° 26'00"
76° 25'30"
76° 25'00"
76° 24'30
76° 24'00"
38° 52' 00"
38° 51' 30"
38° 51' 00"
76° 26'00"
38° 52' 00"
NAD 27
3/9/1988 F.L.S
✓L.G.C.
FE-305 SS
MARYLAND
CHESAPEAKE BAY
KENT POINT TO THOMAS POINT SHOAL
28 APRIL TO 14 SEPT 1987
SCALE 1:10000
SHEET 4 OF 5
ITEM AWOIS 4460

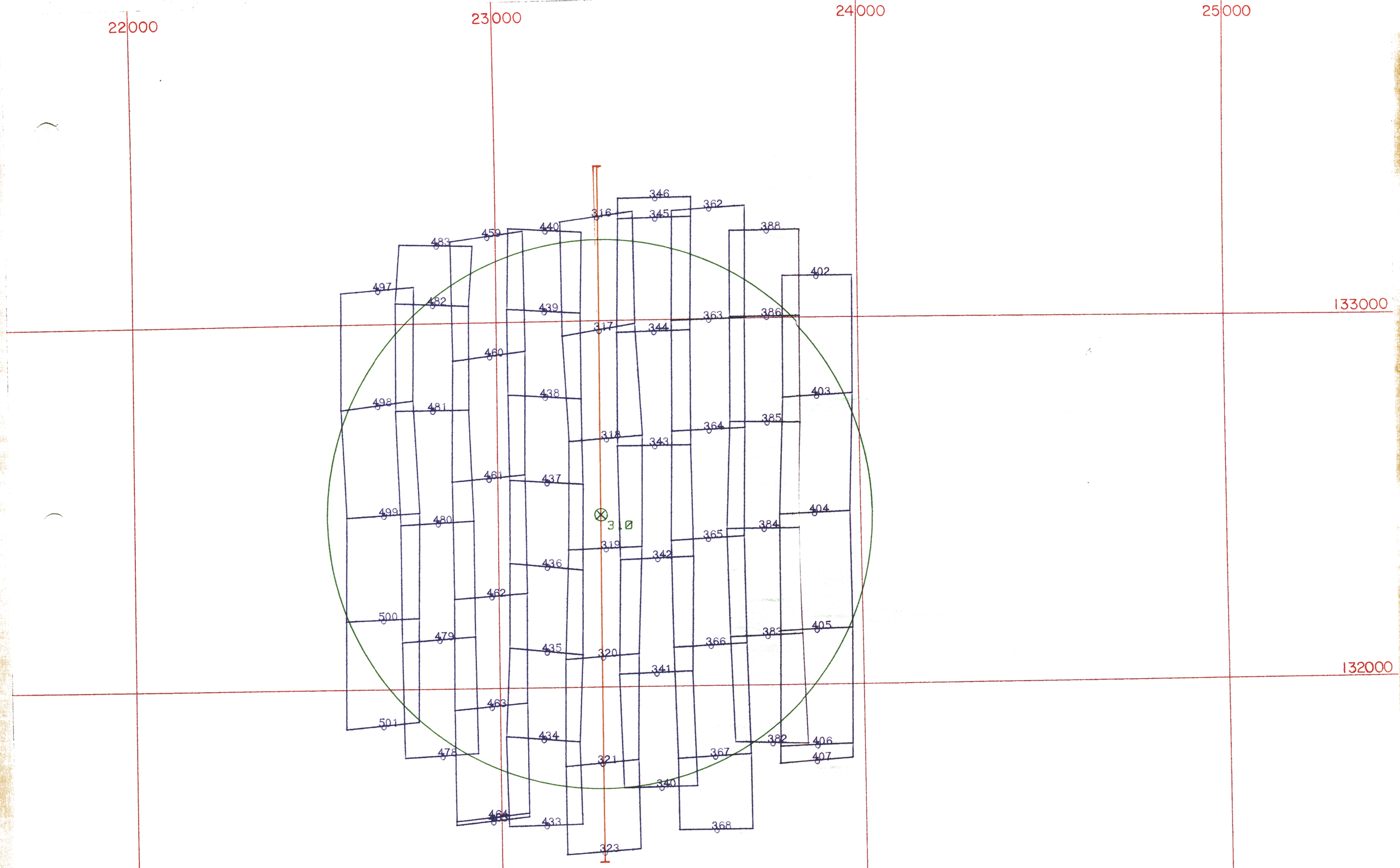


EDITED LINES ARE PLOTTED IN RED
(EDITED PORTIONS ARE DENOTED BY TIC MARKS)

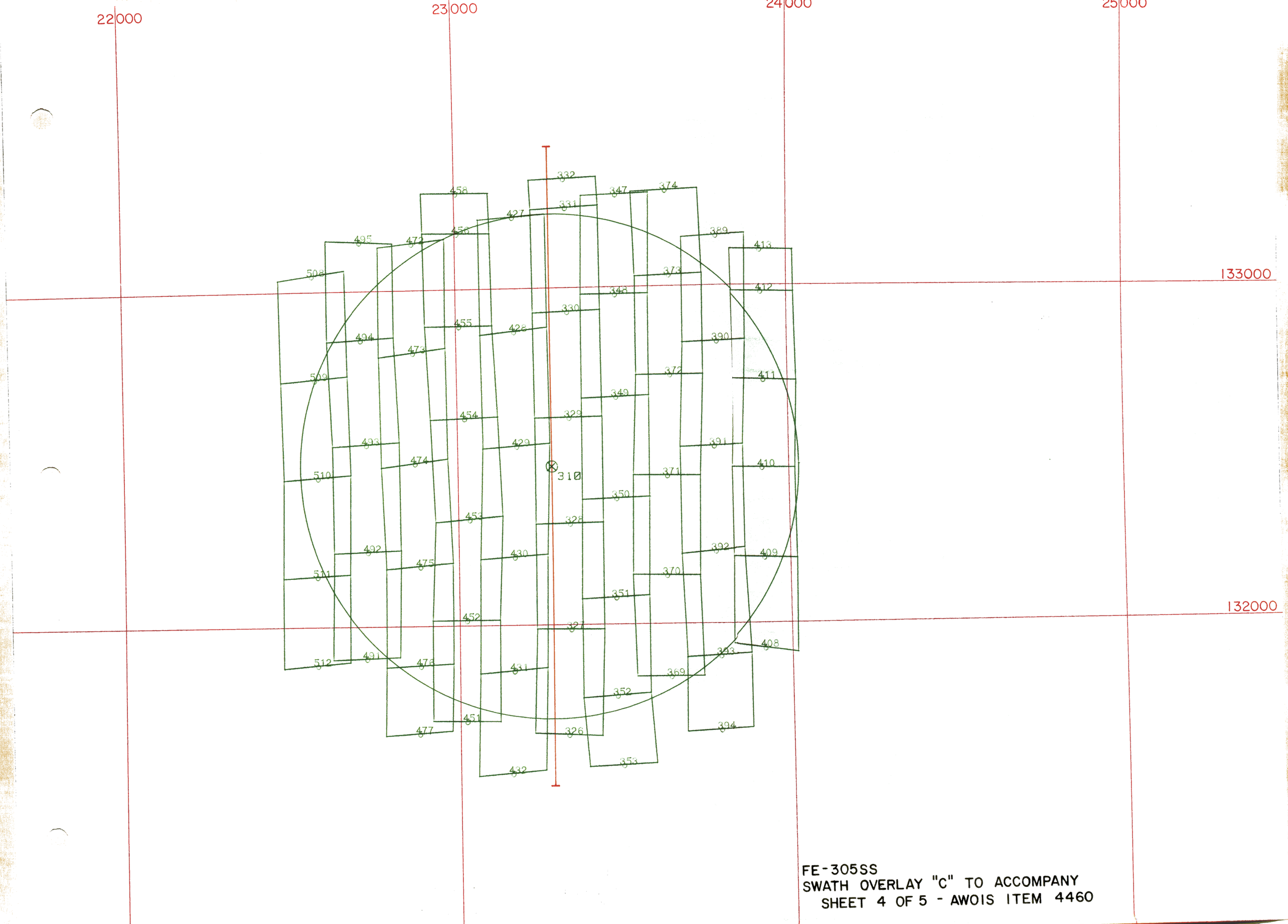
FE-305SS
TRACK PLOT - AWOIS ITEM 4460
SHEET 4 OF 5



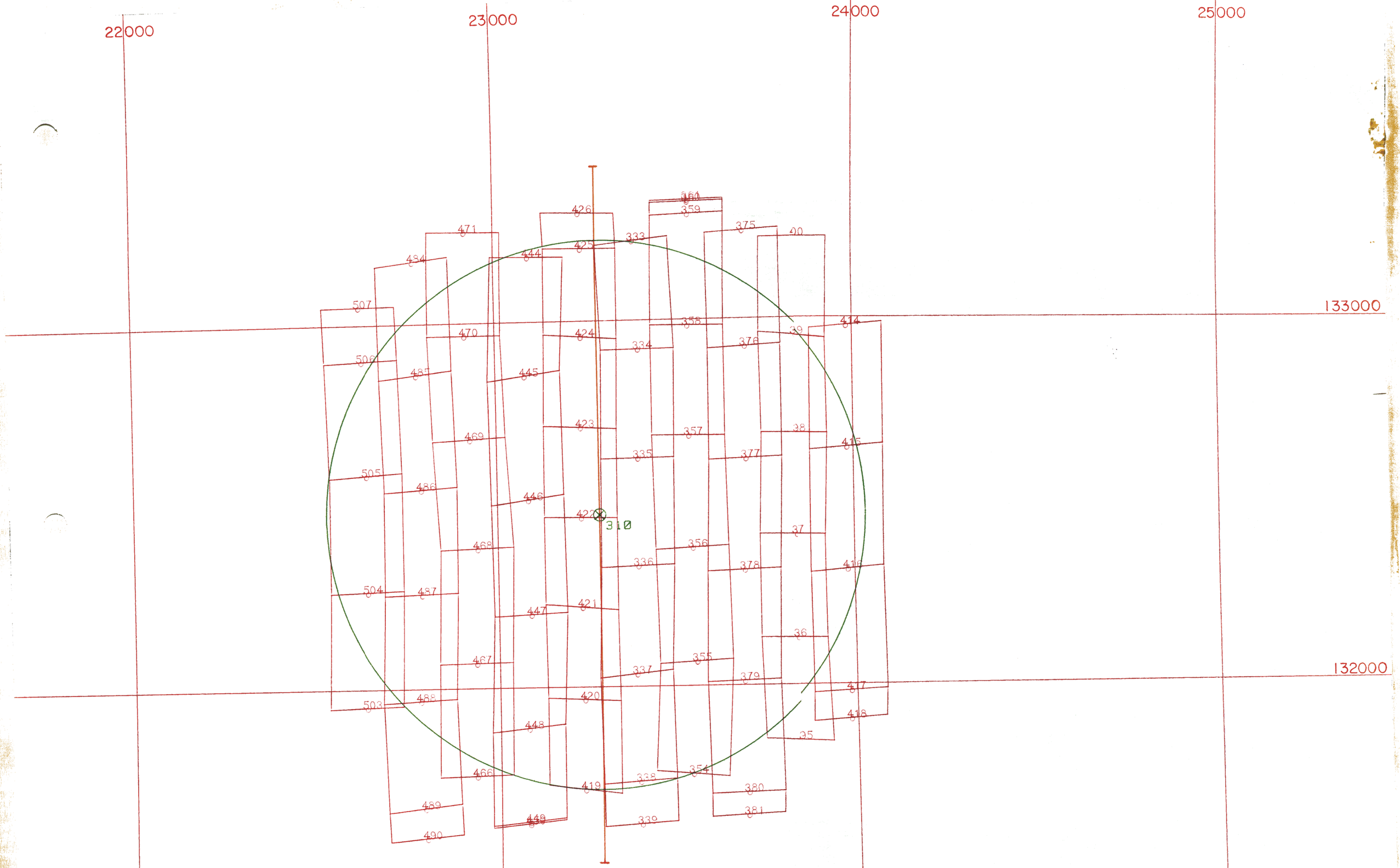
FE-305SS
SWATH OVERLAY "A" TO ACCOMPANY
SHEET 4 OF 5 - AWOIS ITEM 4460



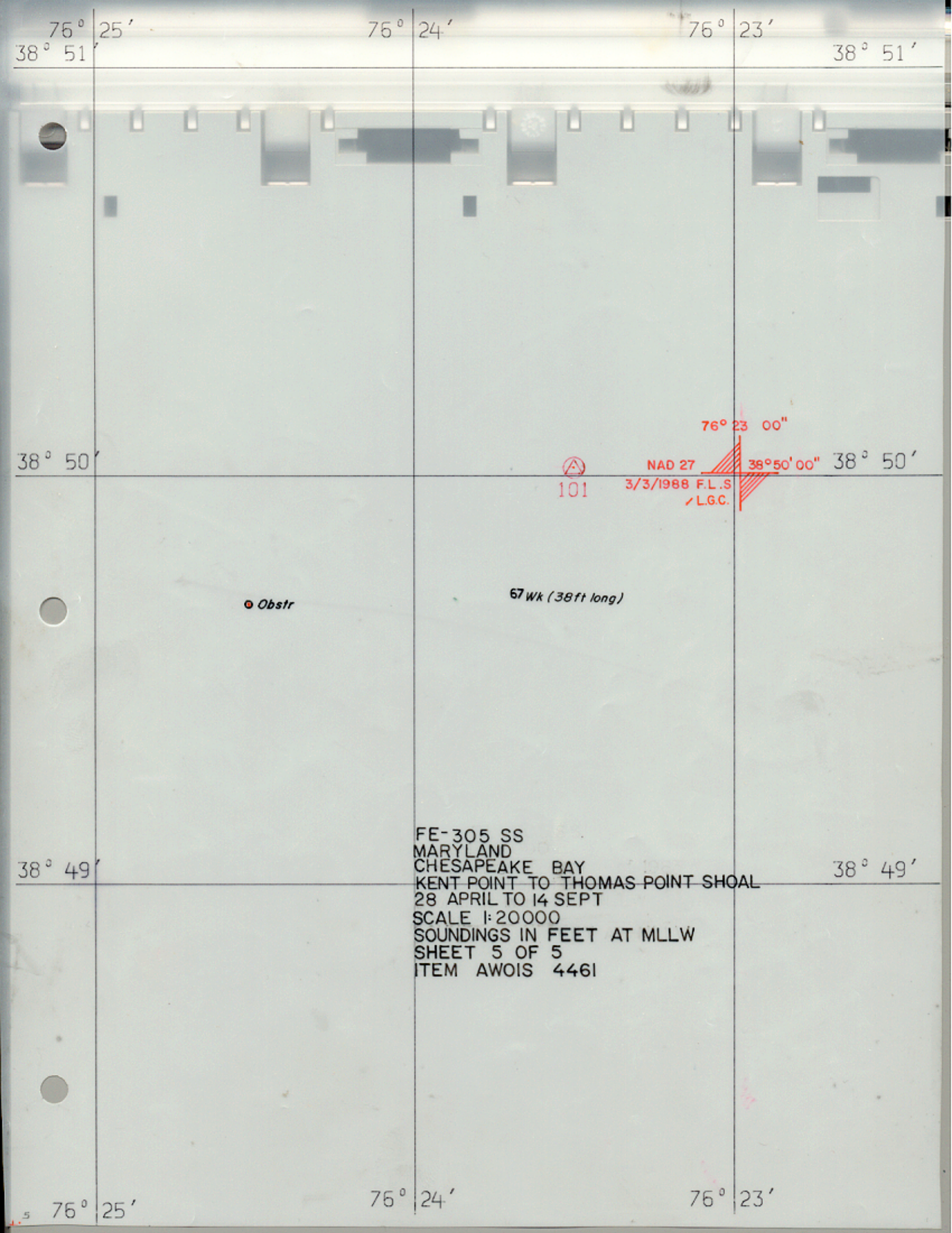
FE-305SS
SWATH OVERLAY "B" TO ACCOMPANY
SHEET 4 OF 5 - AWOIS ITEM 4460

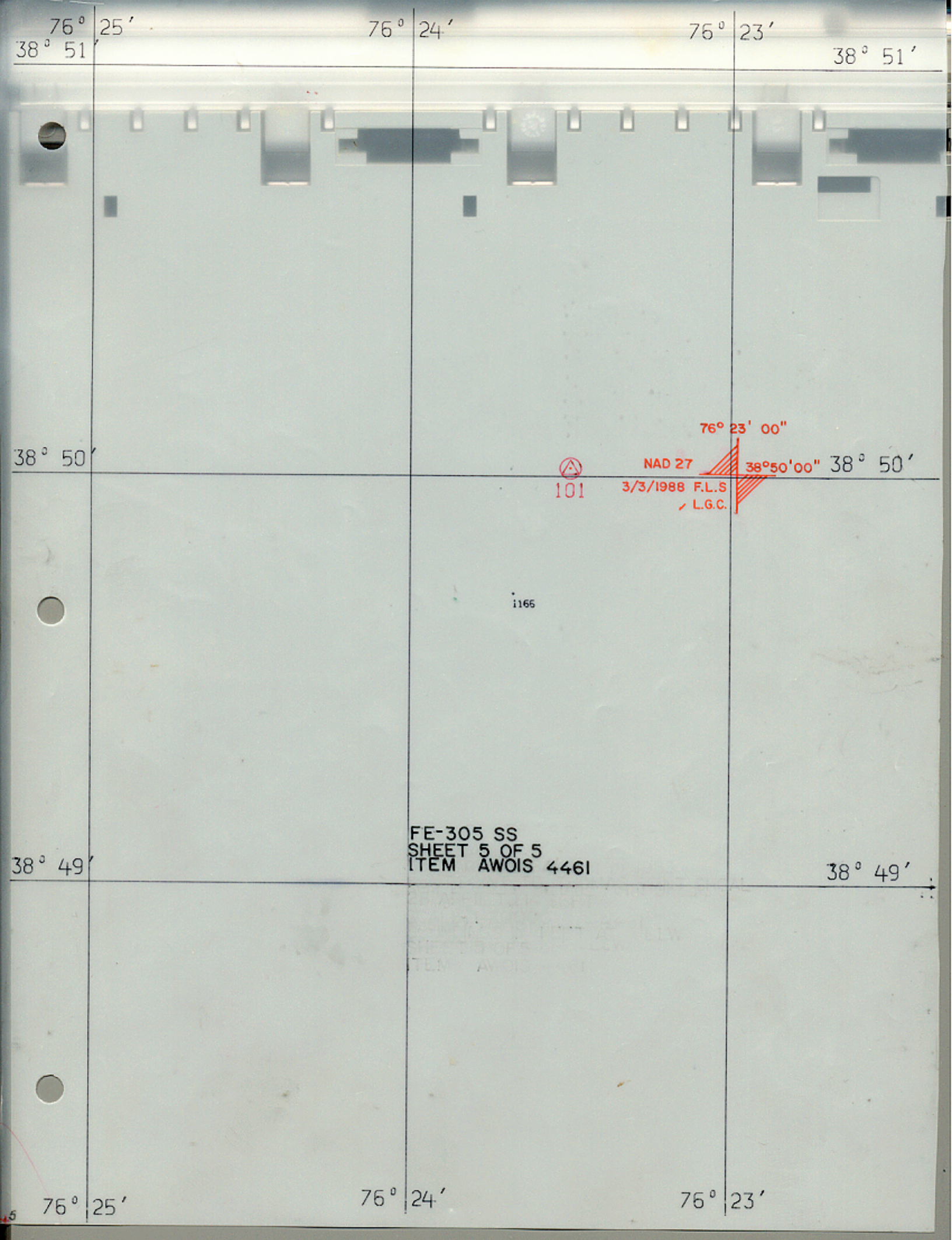


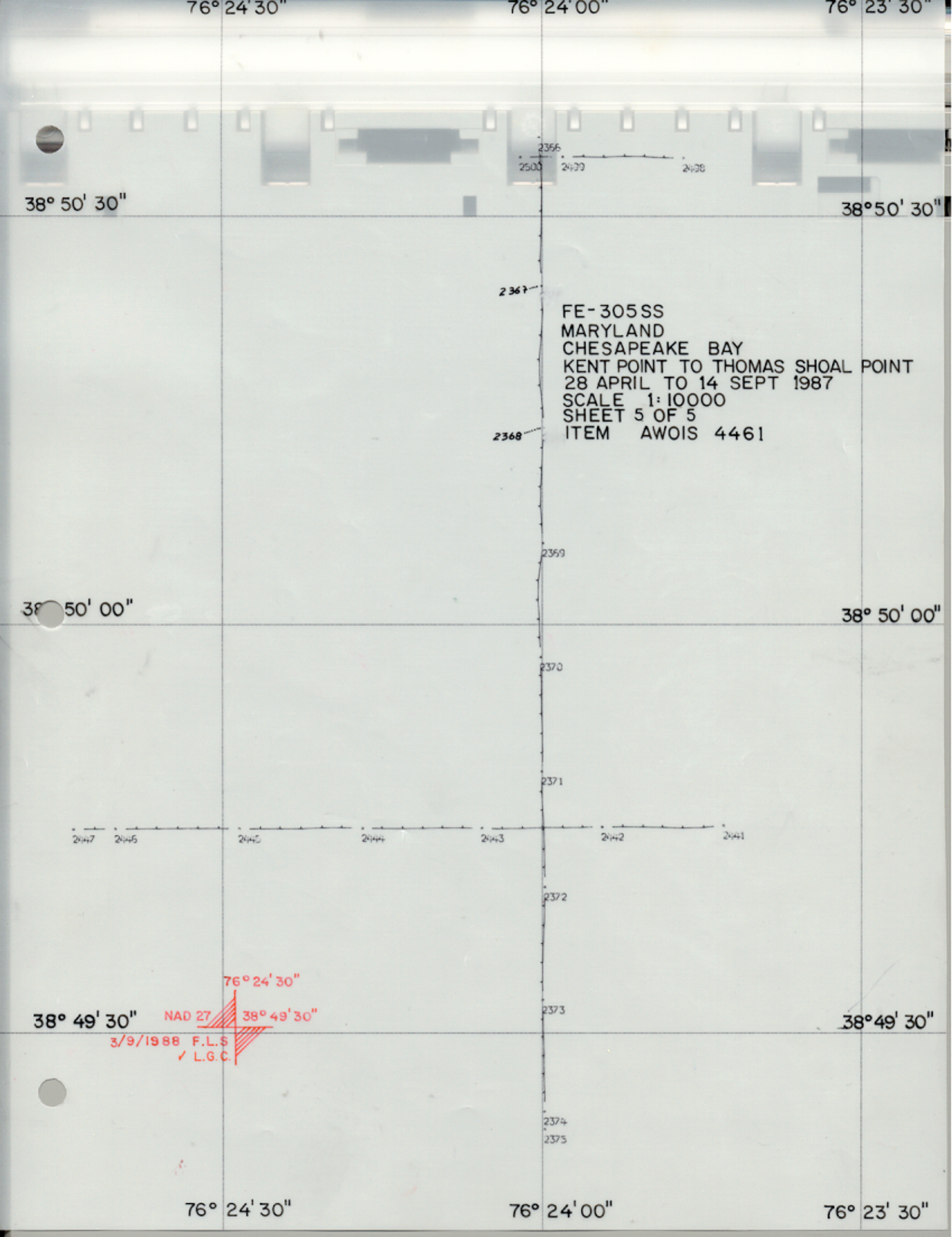
FE-305SS
SWATH OVERLAY "C" TO ACCOMPANY
SHEET 4 OF 5 - AWOIS ITEM 4460

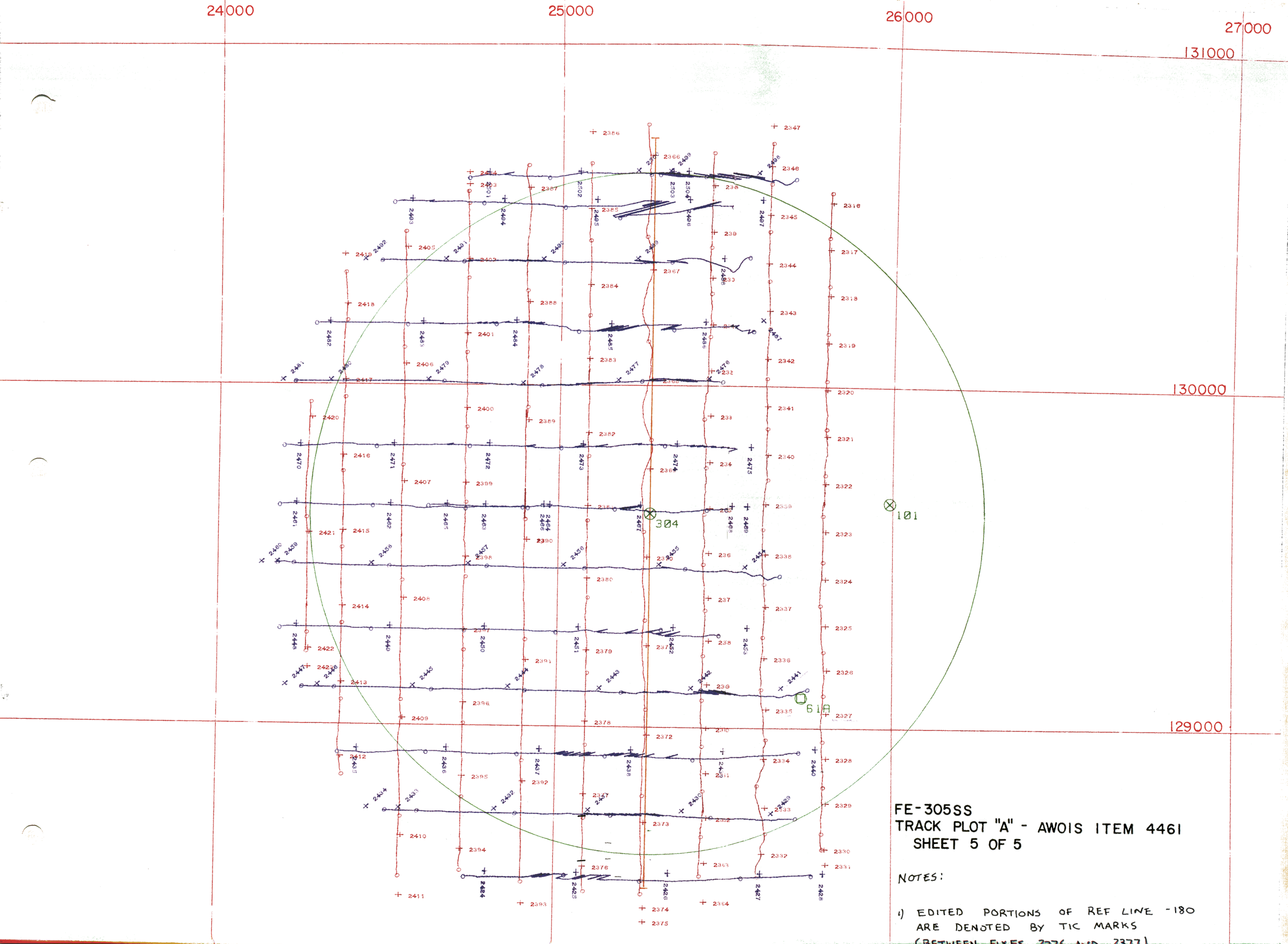


FE-305SS
SWATH OVERLAY "D" TO ACCOMPANY
SHEET 4 OF 5 - AWOIS ITEM 4460


76° 25′
76° 24′
76° 23′
38° 51′
38° 50′
38° 49′
76° 23′ 00"
NAD 27
38°50'00"
3/3/1988 F.L.S
/ L.G.C.
101
Obstr
67 Wk (38 ft long)
FE-305 SS
MARYLAND
CHESAPEAKE BAY
KENT POINT TO THOMAS POINT SHOAL
28 APRIL TO 14 SEPT
SCALE 1:20000
SOUNDINGS IN FEET AT MLLW
SHEET 5 OF 5
ITEM AWOIS 4461


76° 25′
76° 24′
76° 23′
38° 51′
38° 51′
38° 50′
38° 50′
76° 23′ 00"
NAD 27
38°50'00"
101
3/3/1988 F.L.S
L.G.C.
i166
FE-305 SS
SHEET 5 OF 5
ITEM AWOIS 4461
38° 49′
38° 49′
76° 25′
76° 24′
76° 23′


76° 24' 30"
76° 24' 00"
76° 23' 30"
38° 50' 30"
38° 50' 00"
38° 49' 30"
2366
2500
2439
2438
2367
2368
2369
2370
2371
2447
2446
2445
2444
2443
2442
2441
2372
2373
2374
2375
FE-305SS
MARYLAND
CHESAPEAKE BAY
KENT POINT TO THOMAS SHOAL POINT
28 APRIL TO 14 SEPT 1987
SCALE 1:10000
SHEET 5 OF 5
ITEM AWOIS 4461
76° 24' 30"
NAD 27
38° 49' 30"
3/9/1988 F.L.S
✓ L.G.C.

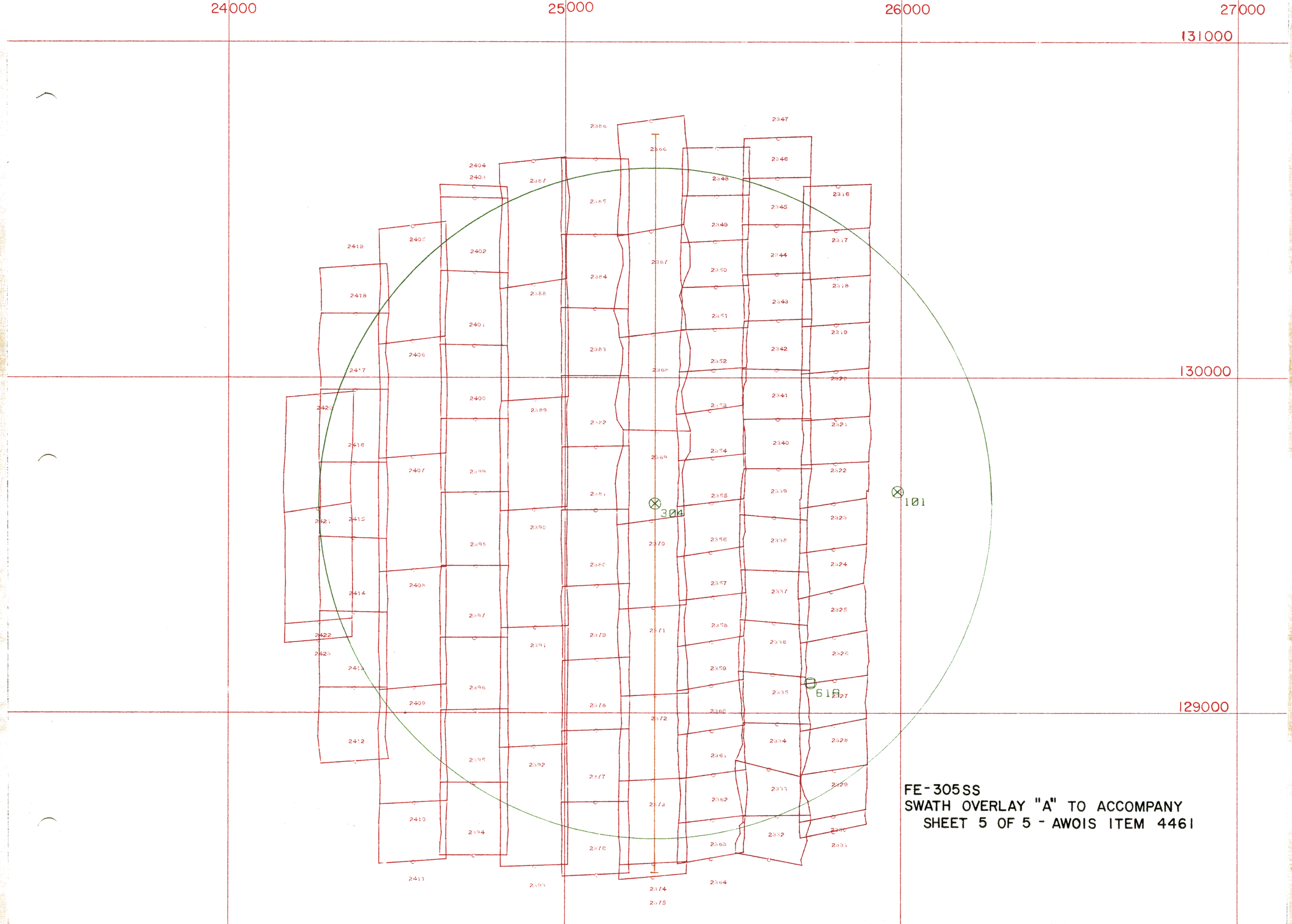


FE-305SS
TRACK PLOT "A" - AWOIS ITEM 4461
SHEET 5 OF 5

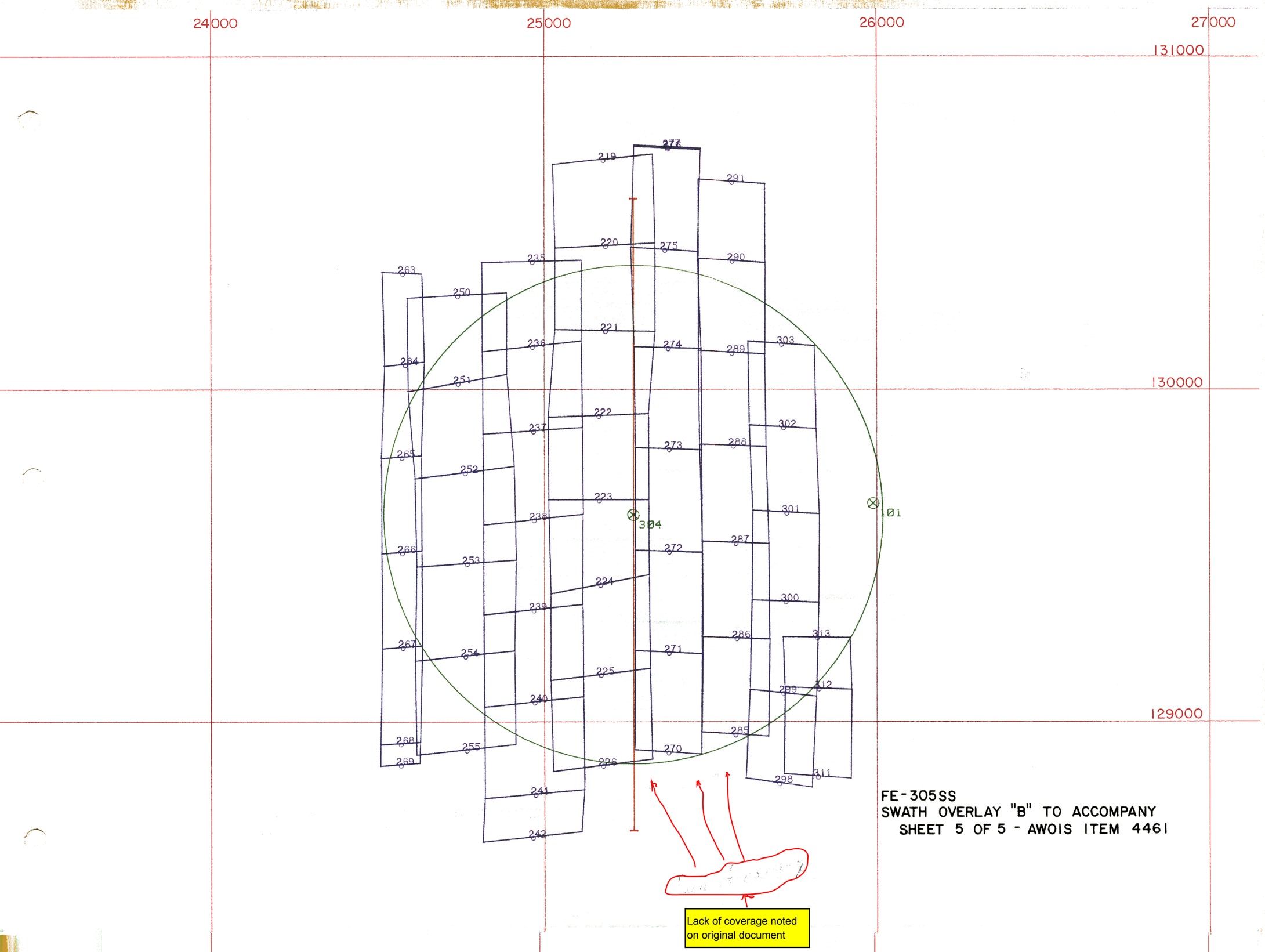
NOTES:

1) EDITED PORTIONS OF REF LINE -180 ARE DENOTED BY TIC MARKS (BETWEEN FIXES 2376 AND 2377)

2) ON E/W LINES, VESSEL TRACK REMAINED CONSISTENT THOUGH HDAS INCORRECTLY PLOTTED THE FISH TRACK; MAY HAVE BEEN CAUSED BY INCORRECT OFFSET COMPUTATIONS.

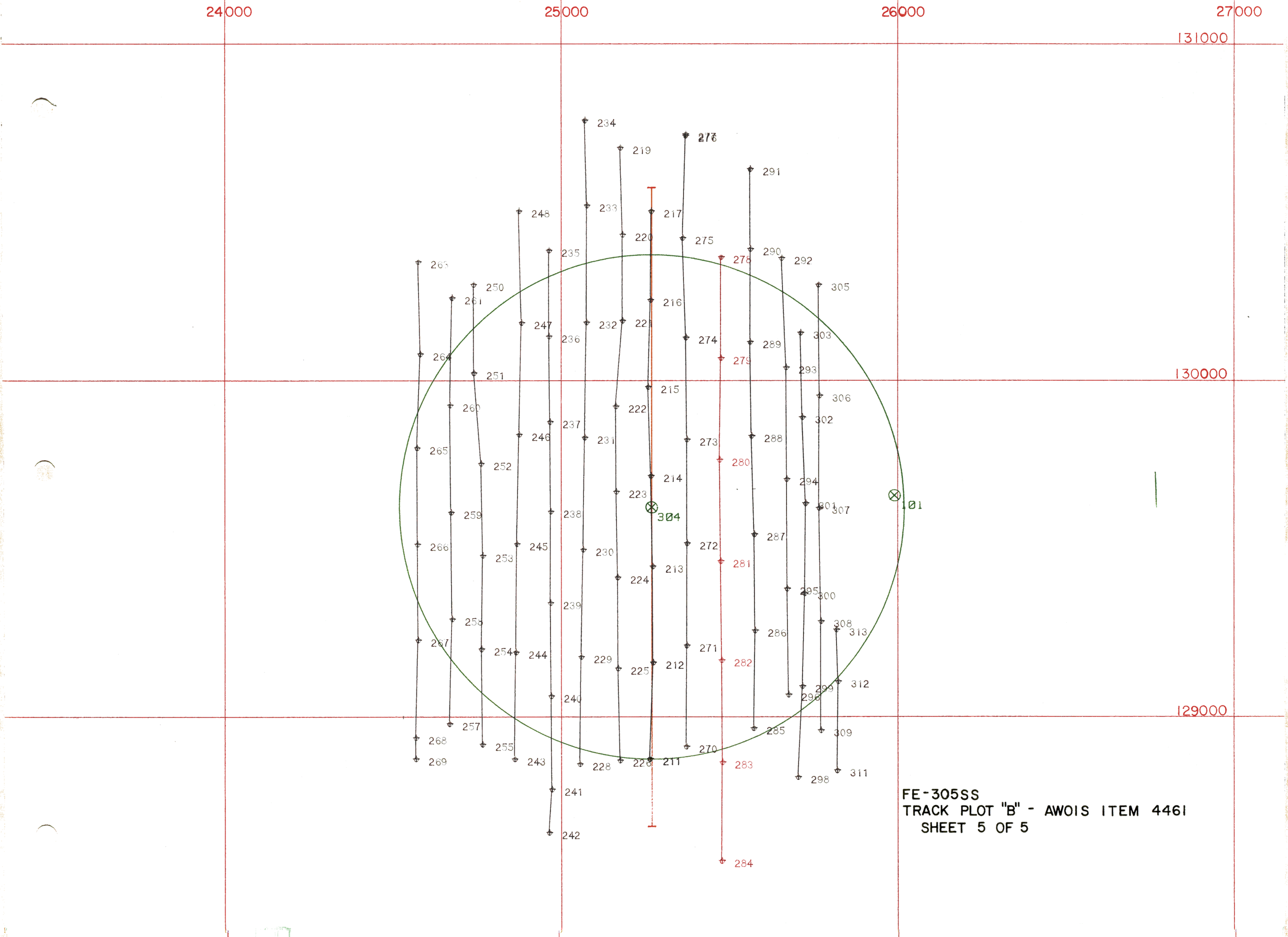


FE-305SS
SWATH OVERLAY "A" TO ACCOMPANY
SHEET 5 OF 5 - AWOIS ITEM 4461

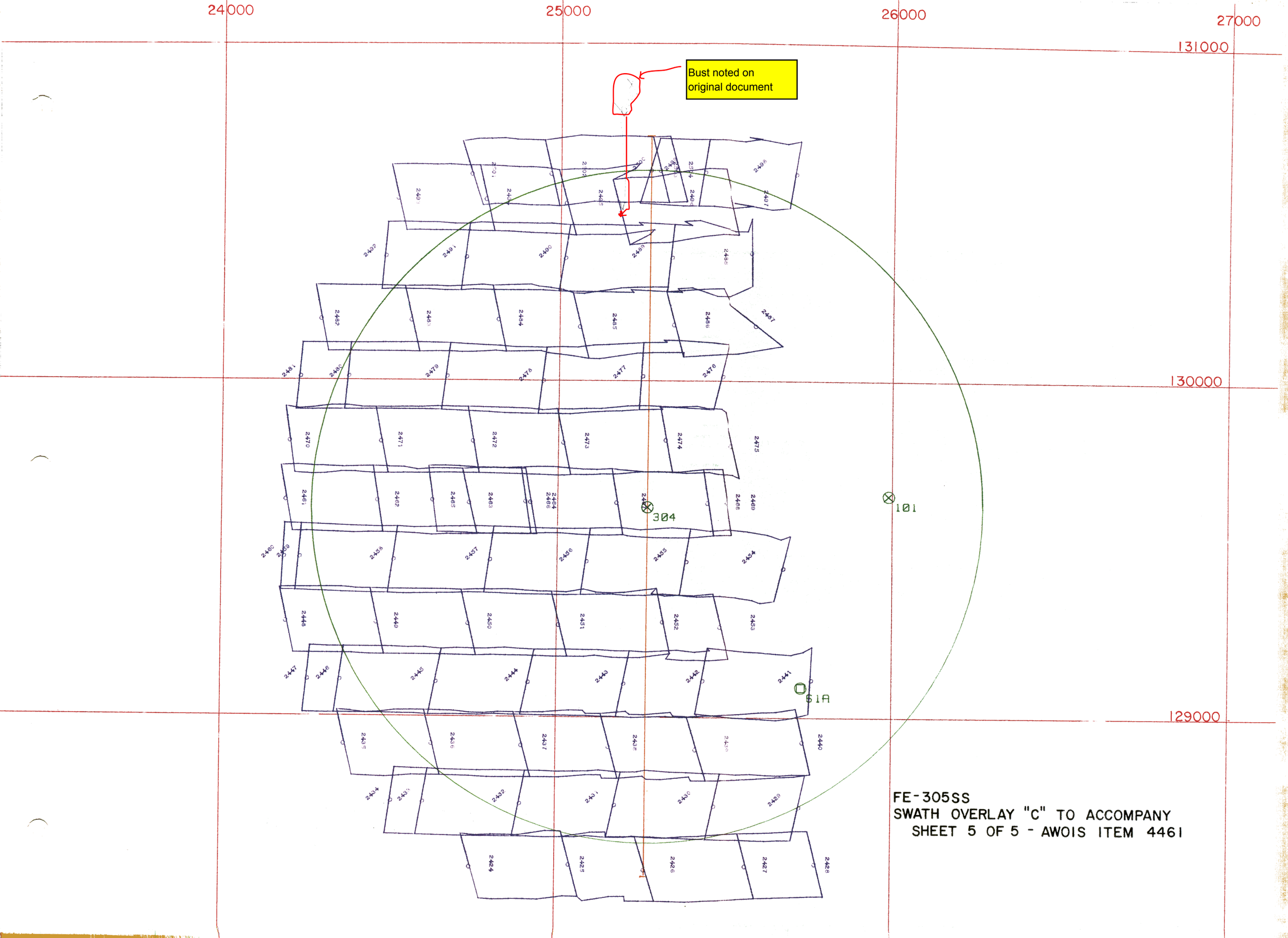


FE-305SS
SWATH OVERLAY "B" TO ACCOMPANY
SHEET 5 OF 5 - AWOIS ITEM 4461

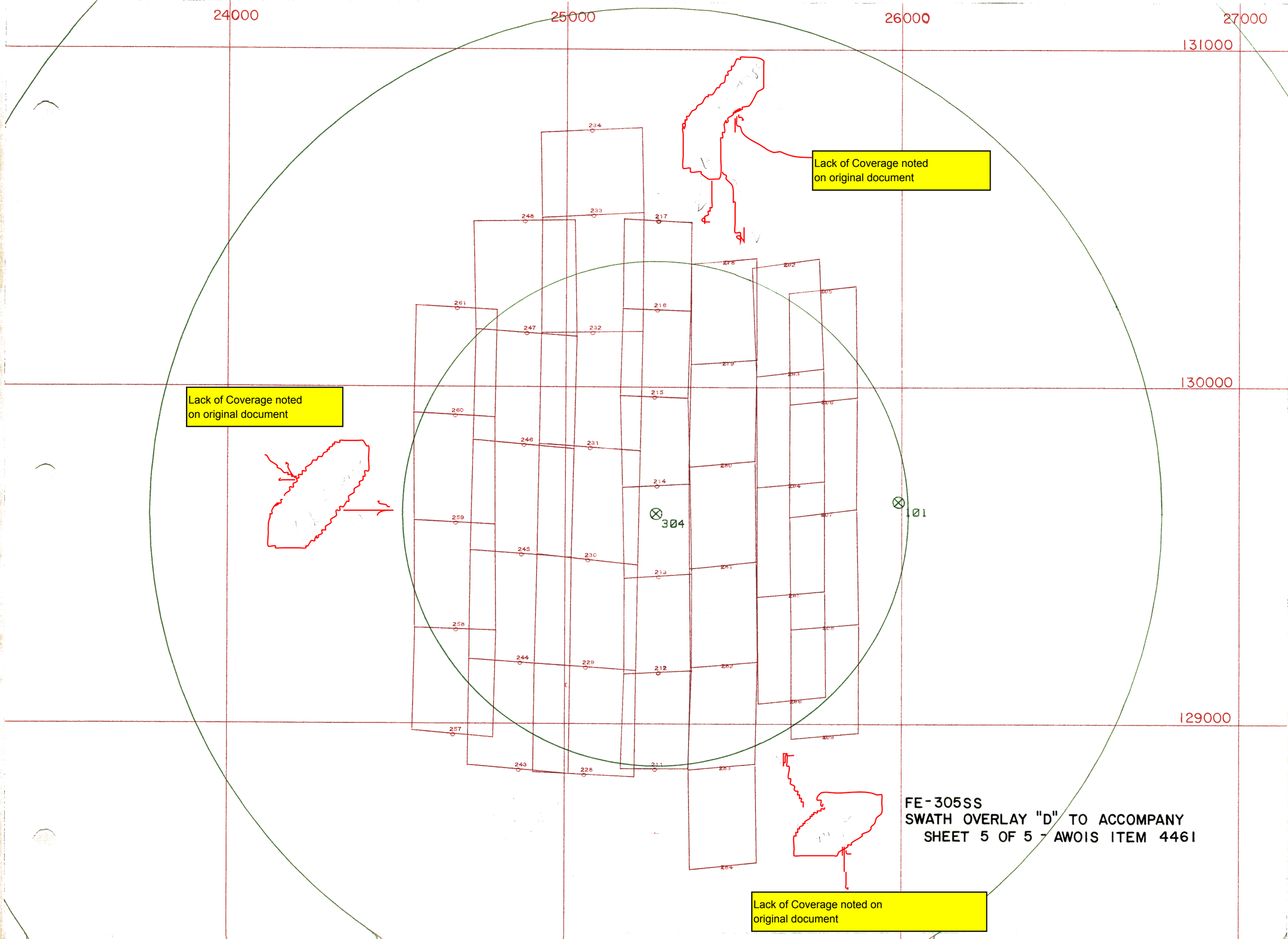
Lack of coverage noted on original document

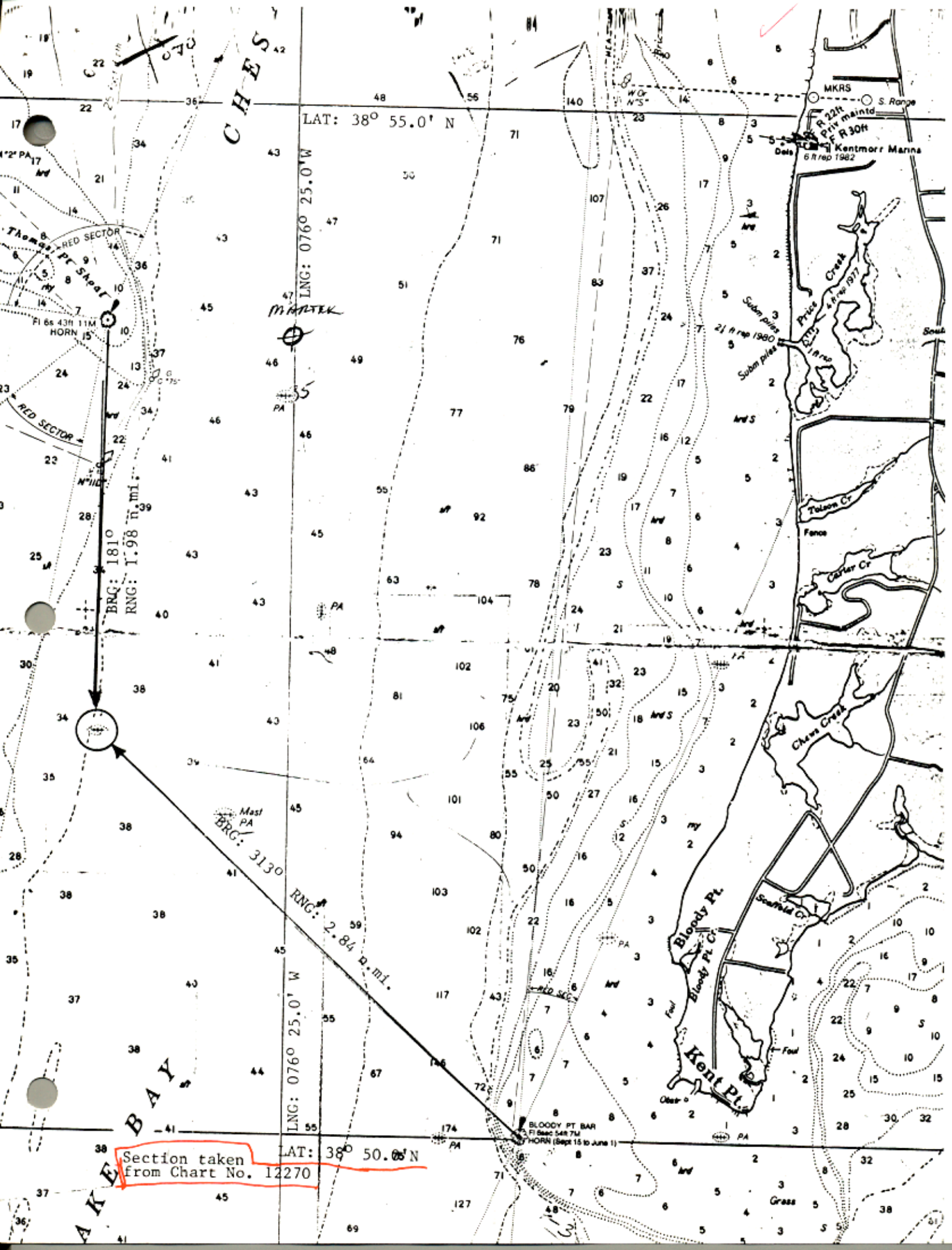


FE-305SS
TRACK PLOT "B" - AWOIS ITEM 4461
SHEET 5 OF 5



FE-305SS
SWATH OVERLAY "C" TO ACCOMPANY
SHEET 5 OF 5 - AWOIS ITEM 4461


24000
25000
26000
27000
131000
130000
129000
Lack of Coverage noted
on original document
Lack of Coverage noted
on original document
Lack of Coverage noted on
original document
304
101
234
233
248
217
261
216
247
232
215
260
246
231
214
259
245
230
213
258
244
229
212
257
243
228
211
FE-305SS
SWATH OVERLAY "D" TO ACCOMPANY
SHEET 5 OF 5 - AWOIS ITEM 4461


LAT: 38° 55.0' N
LAT: 38° 50.0' N
LNG: 076° 25.0' W
LNG: 076° 25.0' W
BRG: 181°
RNG: 1.98 n.mi.
BRG: 313°
RNG: 2.84 n.mi.
Thomas Pt Shoal
RED SECTOR
Fl 6s 43ft 11M
HORN
MARTEK
MKRS
S. Range
Kentmorr Marina
Price Creek
Tolson Cr
Cedar Cr
Chew Creek
Bloody Pt.
Bloody Pt. Cr
Kent Pt.
Scaffold Cr
BLOODY PT. BAR
Fl Bwc 5sft 7M
HORN (Sept 15 to June 1)
Section taken from Chart No. 12270

NOAA FORM 75-96
(10-83)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

MARINE CHART BRANCH

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. FE-305SS

INSTRUCTIONS

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.
1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
12270	4-11-90	John Pierce	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. 50
12263	8-15-90	Teresa Bedell	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. 69
12260	8-16-90	Teresa Bedell	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. 45
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED.