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ANTENNA PATTERN MEASUREMENTS ON
USS TETON (AGC-14)

Martin Katzin,
Coordinator

- Report R-2618 -

FR-2618

Unclassified

* * * Lab. Memo 117-46

Section 1

Approved by: S. G. Lutz, Head, Measurements & Direction Finder Section

Section 2

Approved by: J. P. Hagen, Head, Centimeter Wave Research Section

Dr. A. Hoyt Taylor,
Coordinator, Ship-Shore Radio Division

A. H. Van Keuren, Rear Adm.USN(RET.)
Director, Naval Research Laboratory

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Martin Katzin,
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INTRODUCTION

ANTENNA PATTERN MEASUREMENTS ON USS TETON (AGC-14)

- 0-1. CNO Speedletter Serial 0230620 of 17 May 1944 requested that pattern measurements be made on all antennas of AGC class ships. USS TETON was made available for pattern measurements off the Chesapeake Bay Annex of the Naval Research Laboratory on 4-5 November 1944.
- 0-2. Pattern measurements were made on all communication antennas except those operating in the frequency range of the Model TAJ or TAQ transmitters, since previous tests have shown that patterns in this range are essentially circular. Coverage pattern measurements were made on the forward and aft SG-1 antennas. Due to equipment failure, it was not possible to make measurements on the SK-2, BM, BN and YG antennas.
- 0-3. This report is divided into two sections. Section I gives the pattern measurements of the communication antennas, while Section II gives the coverage patterns of the forward and aft SG-1 antennas.
- 0-4. Summary of Conclusions:
 - 0-4-1. The communication antennas show the normal type of coverage, obtained on other ships of this type, with very few dips below 20 db extending over more than 10 to 15 degrees.
 - 0-4-2. The SG-1 antennas give very good all-around coverage.

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SECTION I

COMMUNICATION ANTENNA PATTERNS

Encl:

- (A) Tables - 1, 2,
- (B) Plates - 55.

1-1 Communication antenna pattern measurements were made on the USS TETON (AGC-14) on 4-5 November 1944. A description of the manner in which the measurements were made is given below. The results obtained are shown on the plates of enclosure (B).

1-2 Tests to determine the patterns of transmitting and receiving antennas were conducted in the order shown in Tables 1 and 2. All tests of Schedule 1 were completed before beginning Schedule 2. The transmitting antennas designated by number under test of Table 1 were energized at the frequency and by a transmitter of the model shown under each test. The receiving antennas shown under each test of Table 2 were energized by four portable transmitters at the frequencies indicated in the Table. The antenna numbers agree with the numbers shown on drawing RY 66Z 007B, which shows the antenna arrangement for ships AGC 10-14. A few exceptions to the arrangement shown on this drawing were noted in communication antennas of the AGC-14. The TCS antennas, numbers 13, 15, and 16, were secured at the top in different locations than those shown on the drawing. Vertical whips were substituted for wire antennas on receiving antennas 10 and 13. There was no change in their location. There are two emergency receiving antennas (whips) on AGC-14. One is located next to receiving antenna 2 and one next to receiving antenna 20. They are designated as 2A (WHIP) and 20A (WHIP) in Table 2.

1-3 During each test, the ship maintained continuous transmission on each antenna under test, except for momentary interruption of the transmissions at each 30-degree interval of relative bearing. This interruption marked the records on the graphic recorders with bearing reference points. Personnel manning the equipment inserted the relative bearings, as given by the ship over the communication channel, on the graphic recording opposite each bearing mark. The ship made two complete circles for each test at a position approximately 4.5 miles southeast of CBA. The relative bearings given by the ship during the tests were taken on a suitable target at CBA. A plus 2 degree correction was made on each relative bearing to account for the displacement of the receiving site from the target.

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1-4 Reception of the transmissions for graphic recording was at Building 5, CBA. Five National NC200 receivers and one Hallicrafters S-27 receiver were used for reception. Each receiver was arranged to drive a graphic recorder by means of a d-c amplifier connected to its a-v-c voltage. The output scale of each receiver-recorder unit was calibrated with a signal generator and this calibration was used in taking data from the graphic recordings for plotting the patterns obtained.

1-5 Patterns were not obtained on antennas of transmitters which operate in the frequency range of the Model TAJ or TAQ transmitters, because previous tests have shown that patterns in this range are essentially circular.

1-6 The field intensity measurements of the transmissions under Schedule 1 were made during performance of Schedule 1 at Plum Point, Maryland. A correction to the relative bearings of CBA from the ship was made to correct for the displacement between CBA and Plum Point. The pattern obtained for each antenna involved in field intensity measurements was used to determine the maximum field intensity for each of the H-F transmissions under Schedule 1. The maximum field intensity is shown on plates 1-28. No field intensity measurements were made on VHF transmissions because of difficulty encountered with equipment.

1-7 All transmitting antennas were grounded except those under test during the transmitter antenna pattern measurements.

1-8 Some of the transmissions fell below the threshold of the receiver-recorder units throughout parts of a circle. Any portions of the patterns that were doubtful are shown in broken lines. Use of two circles for each test permitted verification of the patterns obtained. The ship's headings shown on the plates of enclosure (B) are believed to be accurate within plus or minus 3 degrees.

USS TETON (AGC-14)

Table 1
Schedule I - Test of Transmitting Antennas

	<u>Test 1</u>	<u>Test 2</u>	<u>Test 3</u>	<u>Test 4</u>	<u>Test 5</u>
A	4-TBK 2200 kc	12-TCS 2400 kc	2(22)TBK 2600 kc	19-TBL 2800 kc	11-TCS 3000 kc
B	6-TDE 6300 kc	13-TCS 6500 kc	15-TCS 6700 kc	20-TBL 6900 kc	7-TDE 7100 kc
C	5-TBK 8200 kc	17-TCS 8400 kc	3(21)TBK 8600 kc	9(29)TBL 8800 kc	10(26)TDE 9100 kc
D	1-TBA 9400 kc	10-TCS 9600 kc	16-TCS 9800 kc	7(27)TBM 10000 kc	18-TBL 10200 kc
E	8-TDE 11800 kc	14-TCS 12000 kc	5(25)TDE 12200 kc	8(28)TBL 12400 kc	- - - - - -
F	1-TDQ 126.18 Mc	2-TDQ 140.58 Mc	3-TDQ 116.1 Mc	4-TDQ 123.66 Mc	5-TDQ 140.58 Mc

Table 2

Schedule 2 - Test of Receiving Antennas

<u>Frequency</u>	<u>Test 1</u>	<u>Test 2</u>	<u>Test 3</u>	<u>Test 4</u>	<u>Test 5</u>	<u>Test 6</u>
A 2300 kc	1	4	8	12	16	20
B 4000 kc	2	5	9	13(Whip)	17	20A(Whip)
C 8500 kc	2A(Whip)	6	10(Whip)	14	18	21
D 13500 kc	3	7	11	15	19	22
E	Fwd TBS 72.1 Mc	AFT TBS 72.4 Mc				

TABLE 1
TABLE 2

Enclosure (B)
ANTENNA PATTERNS
USS TITON (AGC-1A)

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Ship's Head
↑

A

0 DB

-5

-10

-15

-20

-25

-30

-30

-25

-20

-15

-10

-5

0 DB

SCHEDULE 1
Test LA
Antenna #5 (TK)
2200 kc
0 DB = 32500 uv/m

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Plate 1
SECTION 1

150° 160° 170° 180° 190° 200° 210°
/ 210° 200° 190° 180° 170° 200° 190°

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Enclosure (B)
ANTENNA PATTERNS
USS TEPON (AGC-14)

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Ship's Head
↑

0 DB

-5

-10

-15

-20

-25

-30

-30

-30

-25

-20

-15

-10

-5

0 DB

SCHEMATIC 1
Test 1B
Antenna 76 (TDE)
6300 kc
0 DB = 12000 uv/m

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Plate 2

Sheet 1

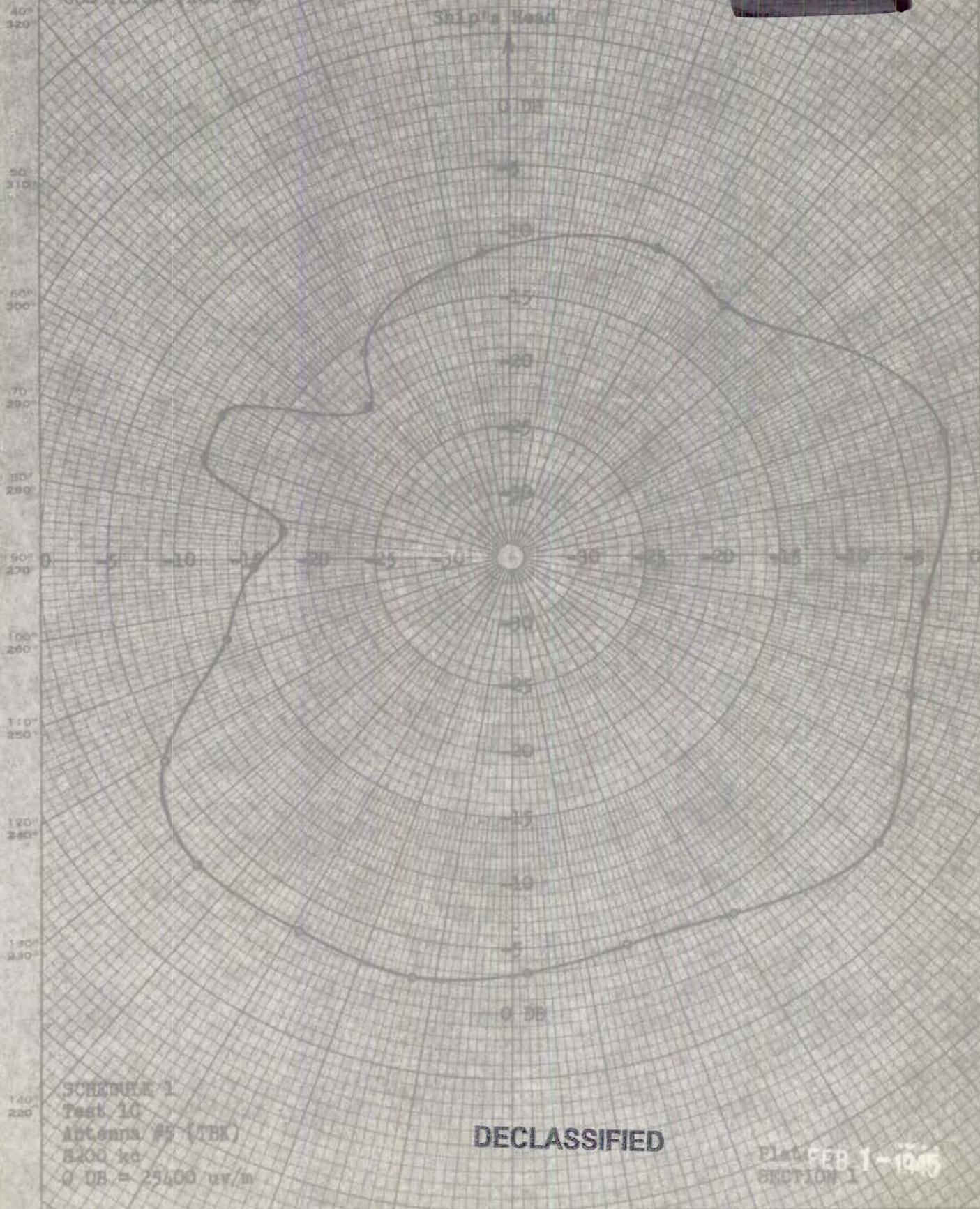
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POLAR COORDINATE

150° 160° 170° 180° 190° 200° 210°
310° 200° 190° 180° 170° 160° 150°

Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-14)

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Ship's Head



SCHEME 1
Test 1C
Antenna #5 (TBK)
8200 kc
0 DB = 25400 uv/m

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PLATE FEB 1 - 1945
SECTION 1

180° 210° 180° 200° 170° 190° 180° 170° 160° 210° 150°

SECRETARY OF THE ARMY

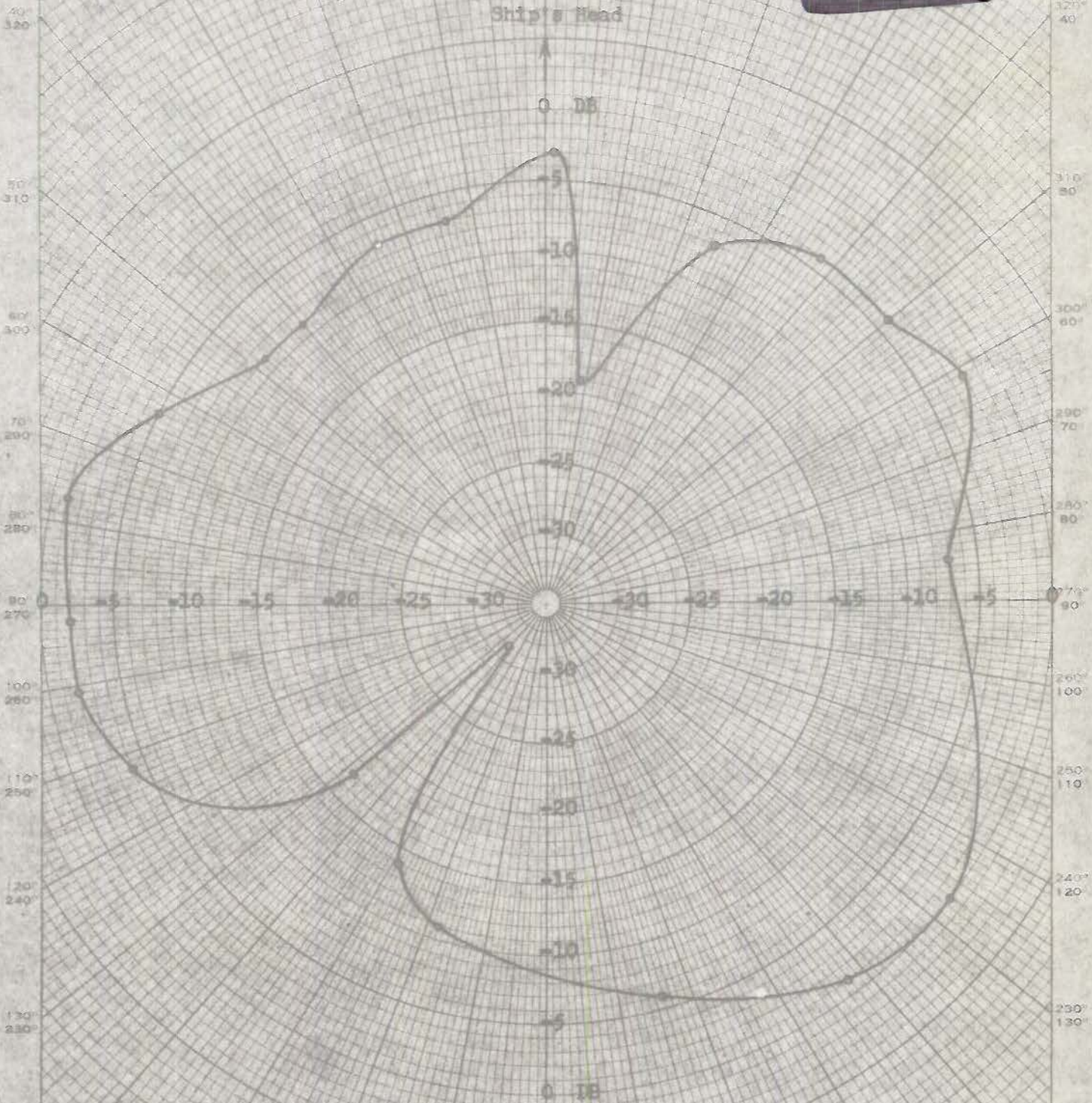
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Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-14)

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Ship's Head



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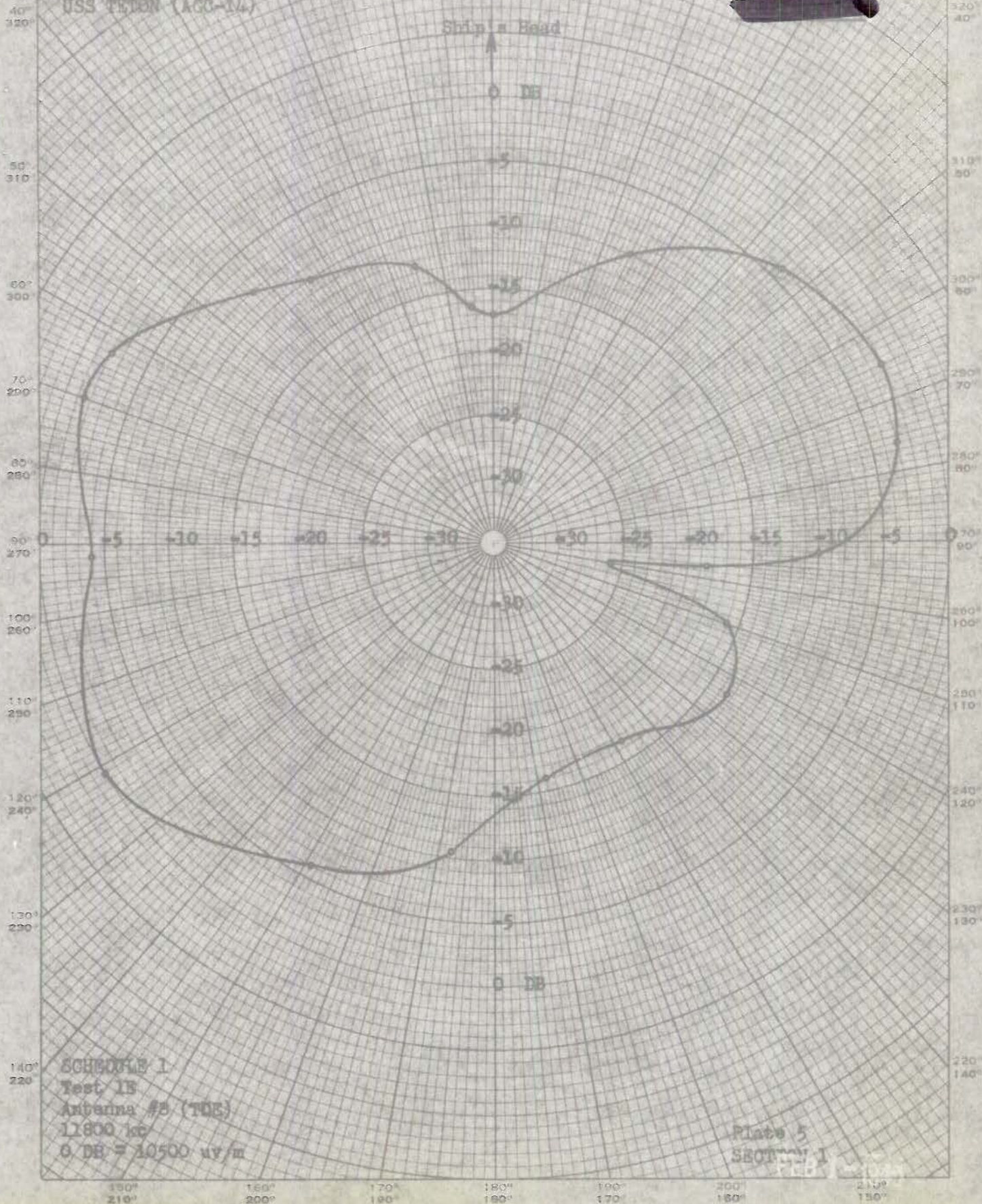
SCHEMATIC 1
Test 1D
Antenna #1 (TBA)
9400 kc
0 DB = 28600 uv/m

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Plate 1
SECTION 1

150° 160° 170° 180° 190° 200° 210°
210° 200° 190° 180° 170° 160° 150°

Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-14)



SCHEDULE 1
Test 1B
Antenna #3 (TDE)
11800 kc
0 DB = 10500 uv/m

Plate 5
SECTION 1

EUGENE L. DIETZDEN, JR.
ANALYST, W. O. S. 2.

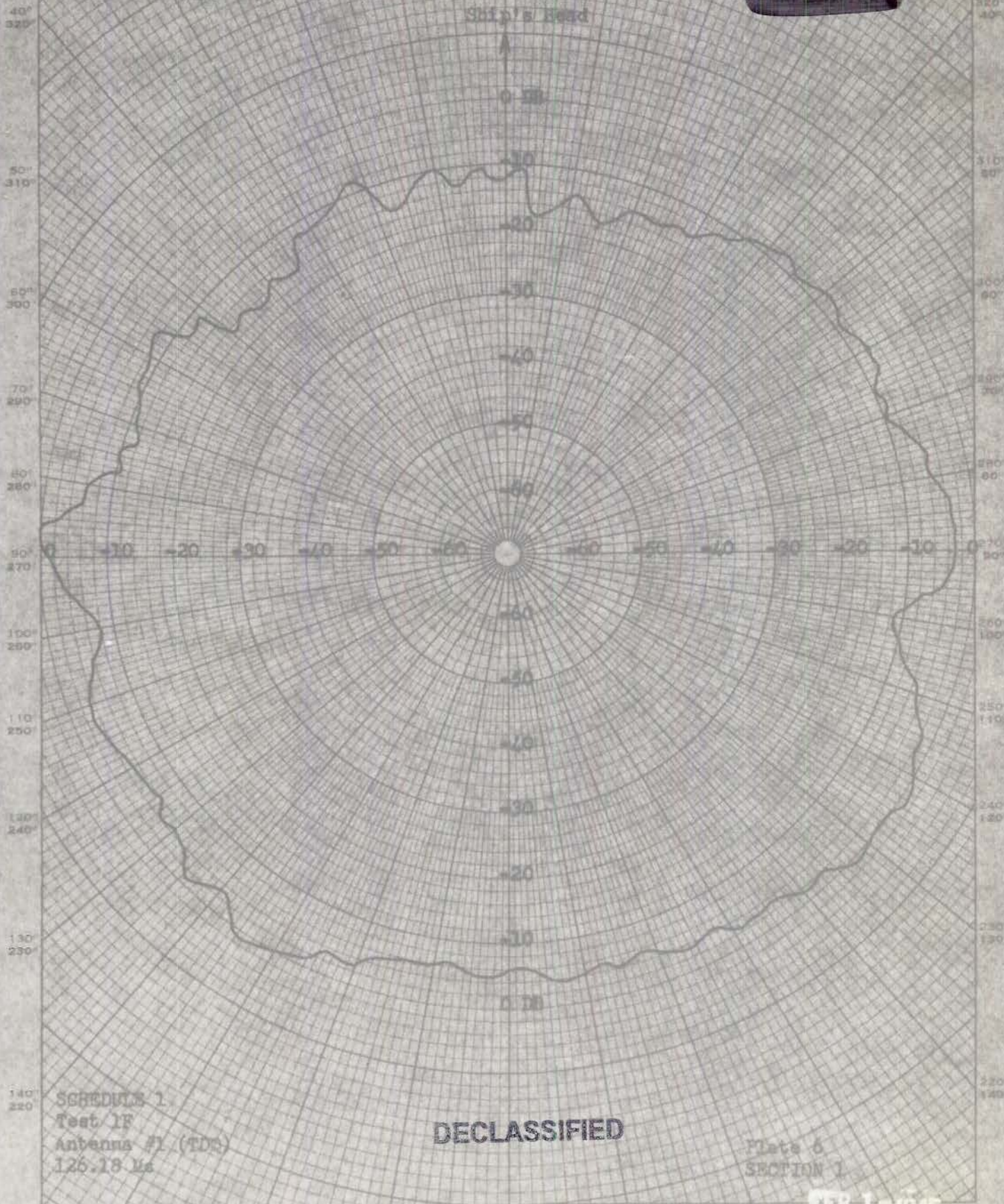
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150° 160° 170° 180° 190° 200° 210°
210° 200° 190° 180° 170° 160° 150°

Enclosure (B)
ANTENNA PATTERNS
USS INTON (AGC-14)

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Ship's Head



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SCHEDULE 1
Test 1F
Antenna #1 (TDR)
126.18 Mc

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Plate 6
SECTION 1

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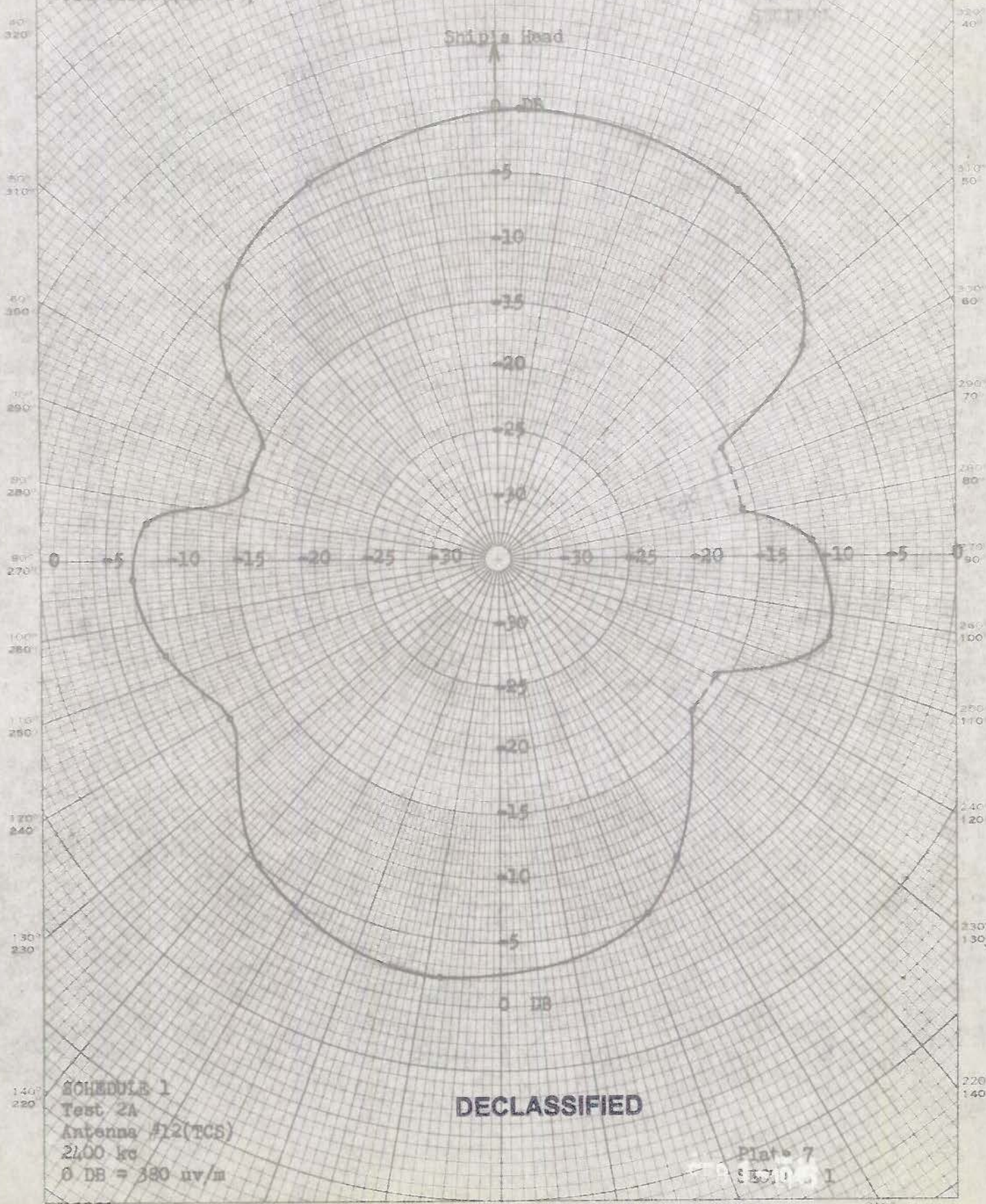
30° 330° 20° 340° 10° 350° 380° 10° 340° 20° 330° 30° 210° 180° 150° 120° 90° 60° 30°

Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-14)

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Ship's Head
↑



SCHEDULE 1
Test 2A
Antenna #12(TCS)
2400 kc
0 DB = 380 mv/m

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Plat # 7
153700-1

ENCLOSURE (B) ANTENNA PATTERNS USS TETON (AGC-14)
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Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-14)

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Ship's Head

0 DB

-5

-10

-15

-20

-25

-30

-35

-40

-45

-50

-55

-60

-65

-70

-75

-80

-85

-90

-95

-100

-105

-110

-115

-120

-125

-130

SCHEDULE 1
Test 2B
Antenna #13 (703)
6500 kc
0 DB = 7,200 uv/m

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Plate 8
SECTION 1

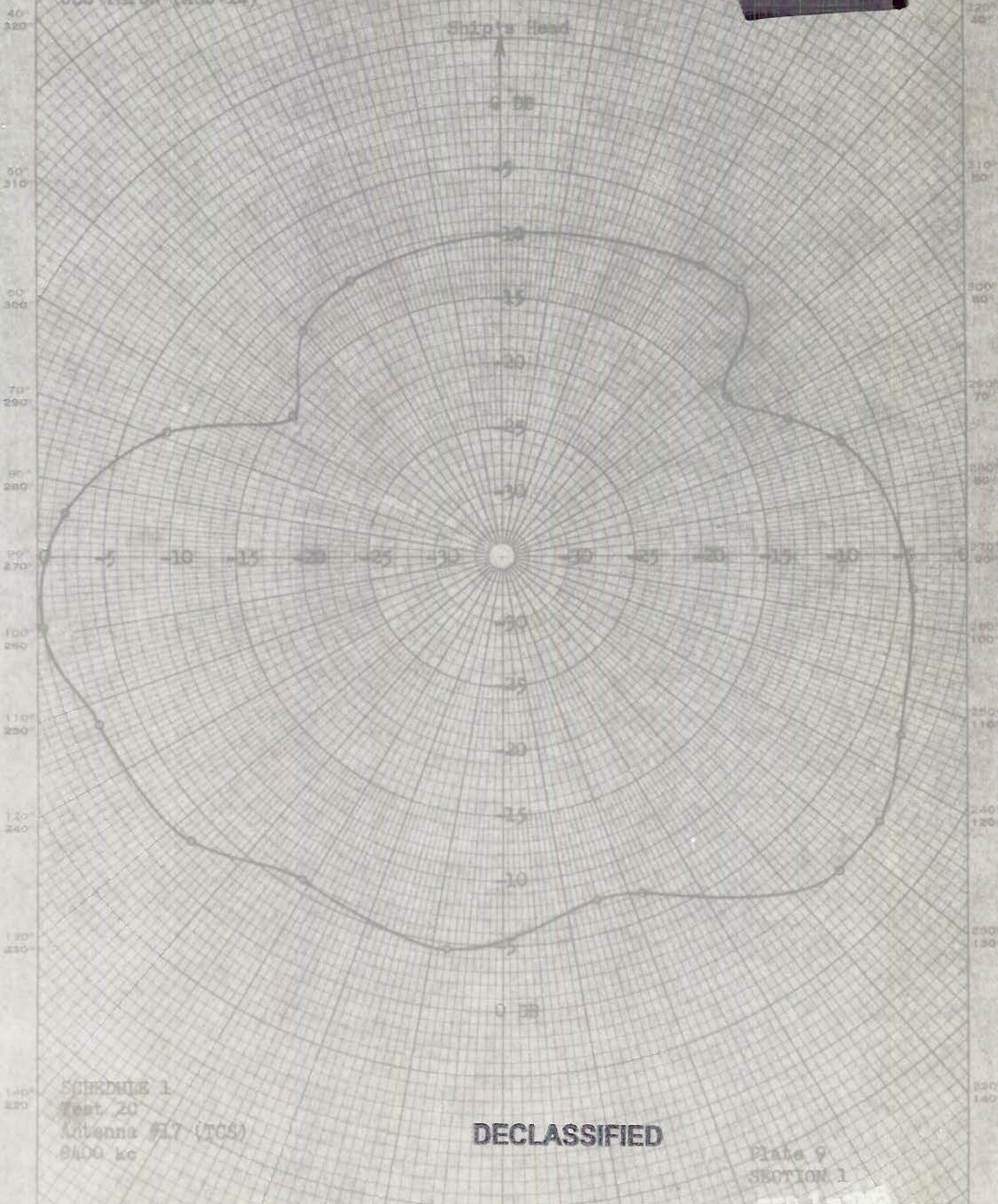
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Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-14)

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Ship's Head



KUGENE DITTVEEN, CC

NO. 34018 - DITTVEEN, GRAPH BARBER
POLAR COORDINATE

SCHEDULE 1
Test 20
Antenna #17 (TCS)
8400 kc

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Plate 9
SECTION 1

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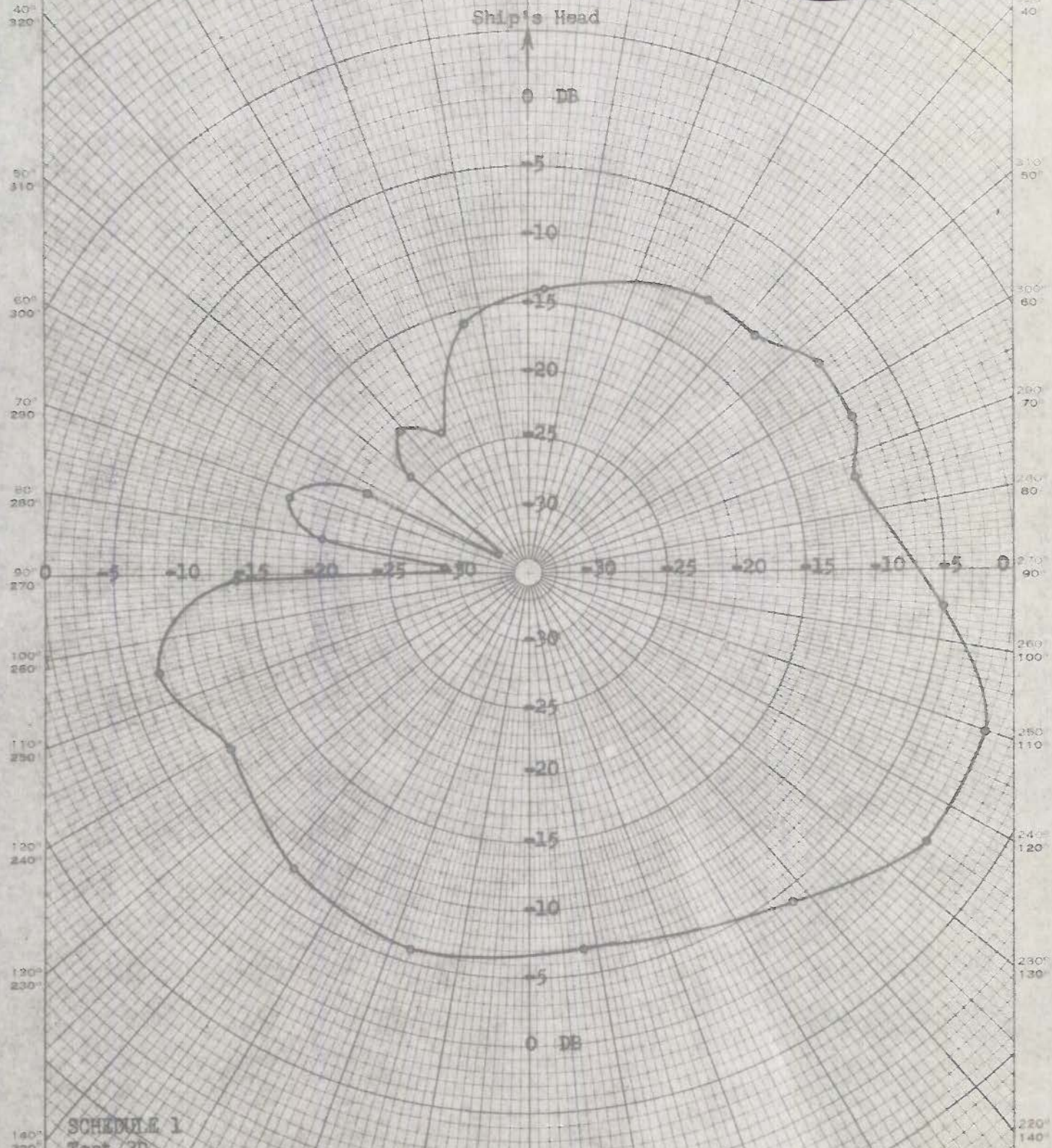
180° 210° 160° 200° 170° 190° 180° 170° 200° 160° 150°

Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-14)

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Ship's Head
↑



SCHEDULE 1
Test 2D
Antenna #10 (TCS)
9600 kc
0 DB = 3300 uv/m

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Plate 10
SECTION 1

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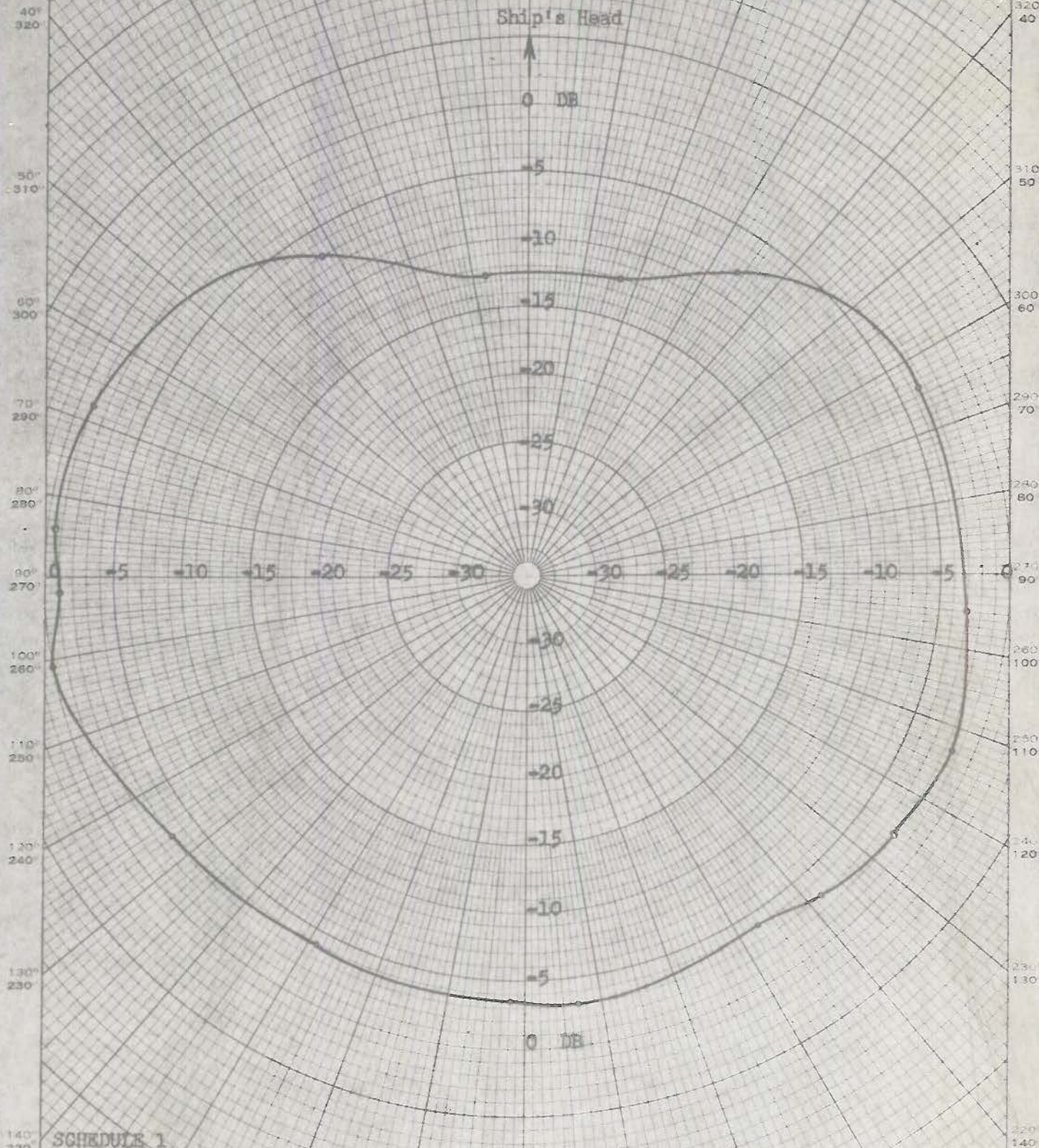
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150° 210° 160° 200° 170° 190° 180° 180° 170° 200° 160° 210° 150°

Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-14)

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Ship's Head
↑



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SCHEDULE 1
Test 2E
Antenna #14 (TGS)
12000 kc
0 DB = 2940 uv/m

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Plate 11
FIGURE 1

150° 210 160° 200° 170° 190° 180° 170° 160° 150°

770 1-195

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ANTENNA PATTERNS
USS TETON (AGC-14)



Ship's Head
↑

0 DB

-10

-20

-30

-40

-50

-60

0 -10 -20 -30 -40 -50 -60 -60 -50 -40 -30 -20 -10 0

-60

-50

-40

-30

-20

-10

0 DB

SCHEDULE 1
Test 2F
Antenna #2 (TDQ)
140.58 Mc

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Plate 12
SECTION 1

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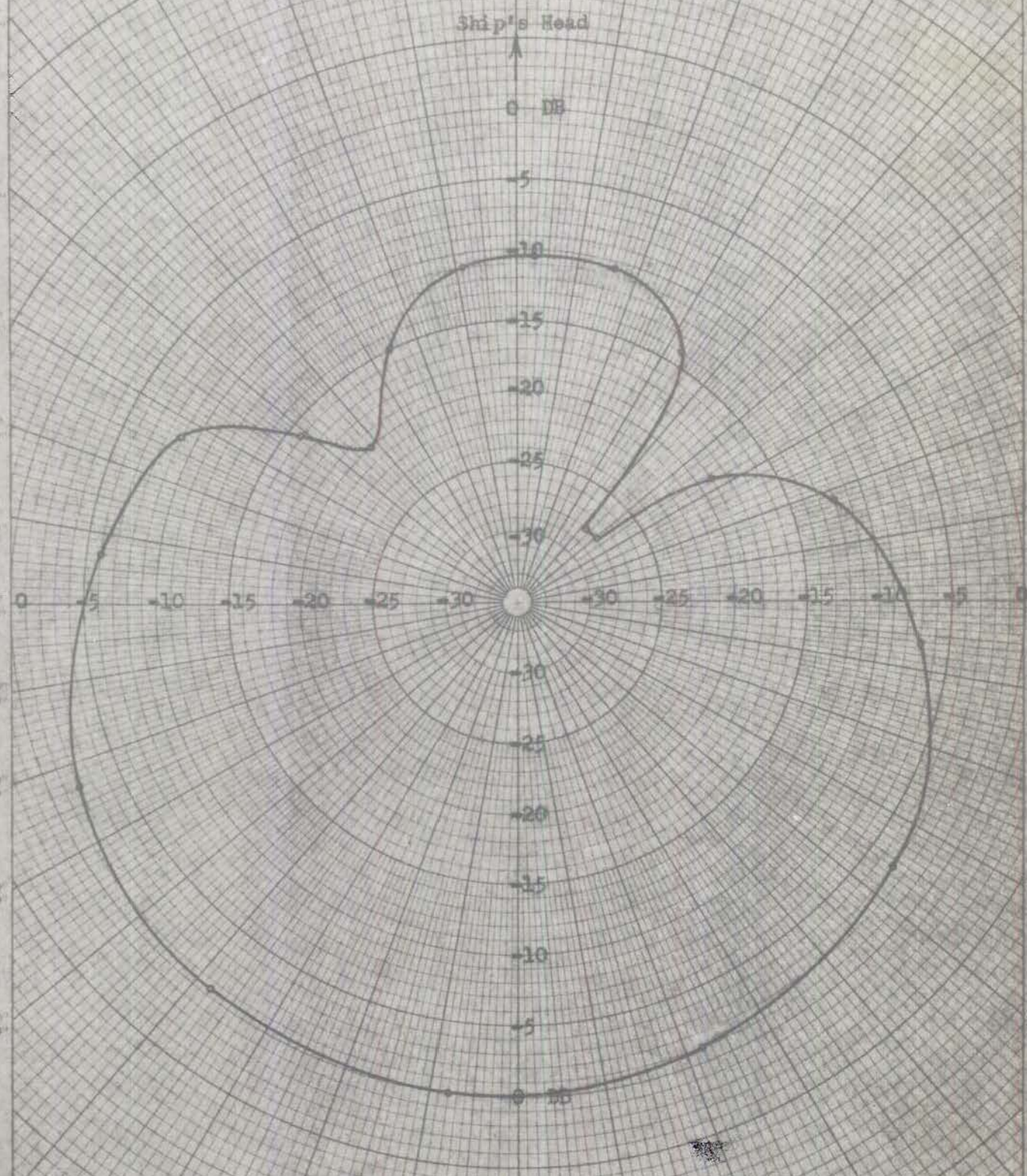
150° 210° 160° 200° 170° 190° 180° 170° 160° 150°

320
310
300
290
280
270
260
250
240
230
220

40°
50°
60°
70°
80°
90°
100°
110°
120°
130°
140°

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ANTENNA PATTERNS
USS TETON (AGC-14)

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SCHEDULE 1
Test 3A
Antenna #2(22) TRK
2600 kc
0 DB = 20,800 W/M

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Plate 13
SECTION 1

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USS TSTON (AGC-14)

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Ship's Head
↑

0 DB

-5

-10

-15

-20

-25

-30

-30

-25

-20

-15

-10

-5

0 DB

SECTION 1
Test 3B
Antenna #15 (TOS)
6700 kc
0 DB = 1900 uv/m

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Plate 14
SECTION 1

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ANTENNA PATTERNS
USS TETON (AFG-14)

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Ship's Head

0 DB

-5

-10

-15

-20

-25

-30

-35

-40

-45

-50

-55

-60

-65

-70

-75

-80

-85

SCHEMATIC 1
Test 36
Antenna #3(21) TBK
8400 kc
0 DB = 56,000 uv/m

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Plate 15
SECTION 1

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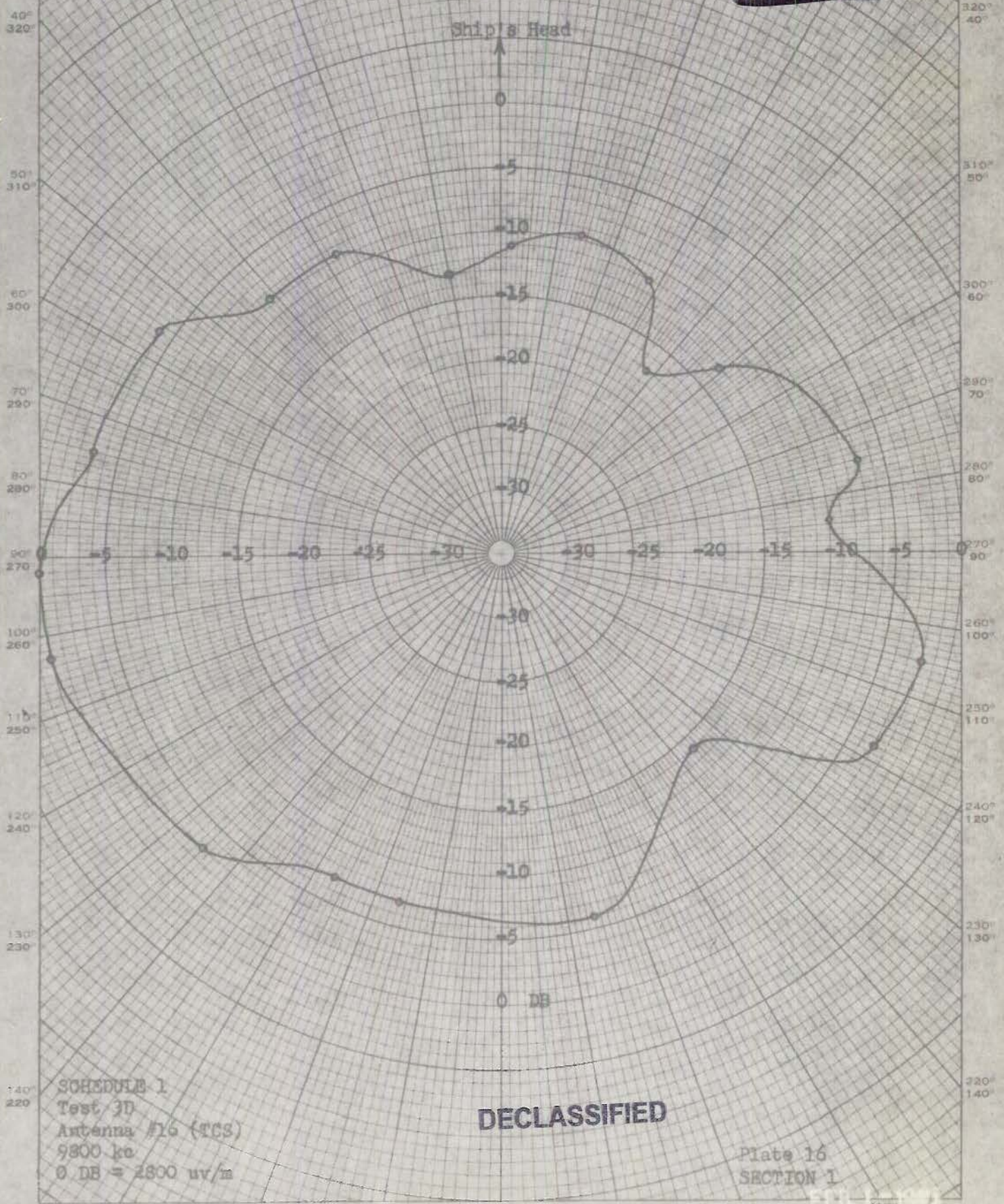
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210° 200° 190° 180° 170° 160°

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ANTENNA PATTERNS
USS TETON (AGC-14)

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Ship's Head
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0



SCHEDULE 1
Test 3D
Antenna #16 (TCS)
9800 kc
0 DB = 1800 uv/m

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Plate 16
SECTION 1

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0 DB

+5

+10

+15

+20

+25

+30

+30

+25

+20

+15

+10

+5

0 DB

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SCHEMATIC 1
Test 3B
Antenna #5 (35) TDE
12200 kc
0 DB = 21000 uv/m

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Plate 17
SECTION 1

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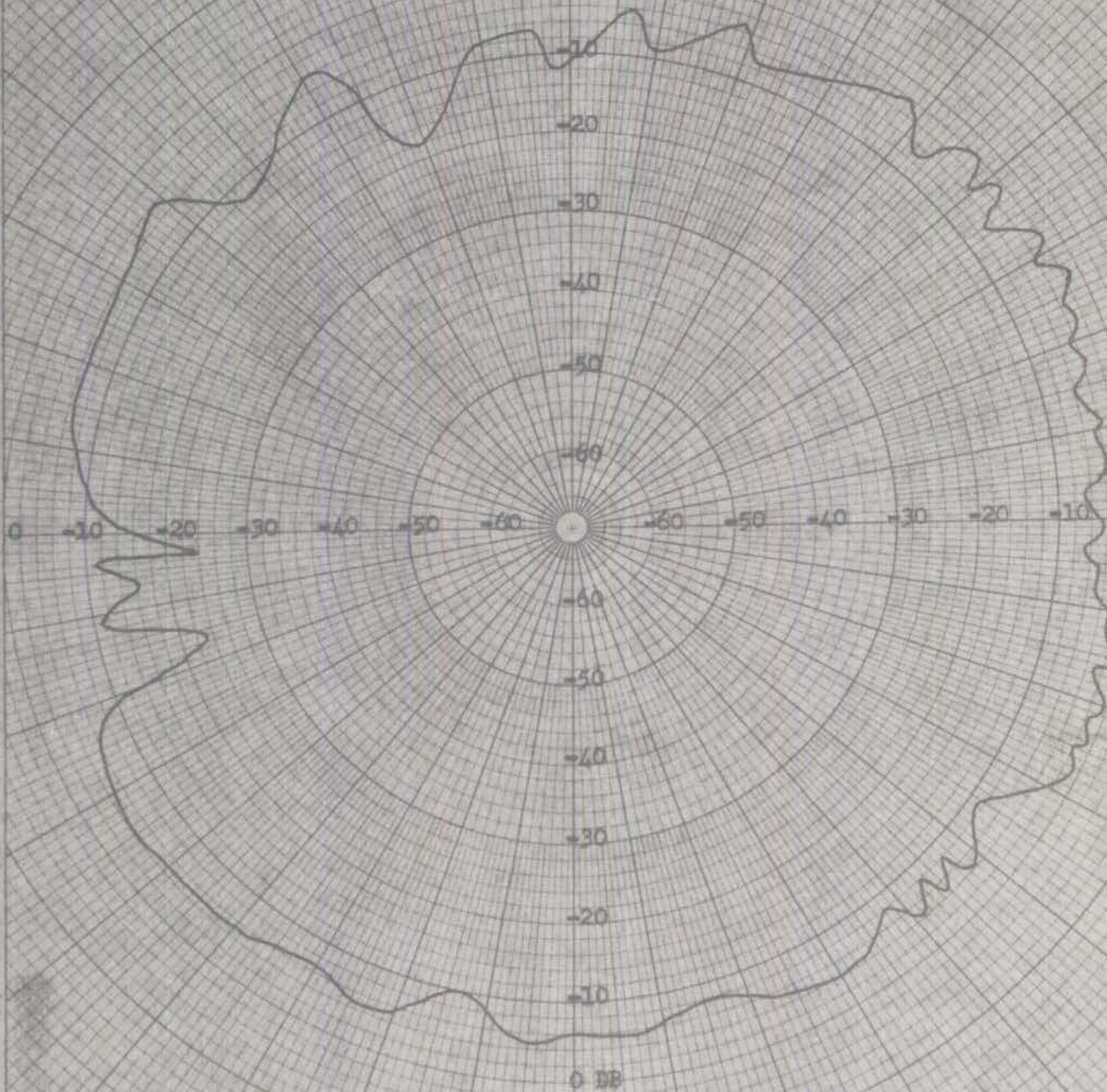
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USS PETON (AGC-14)

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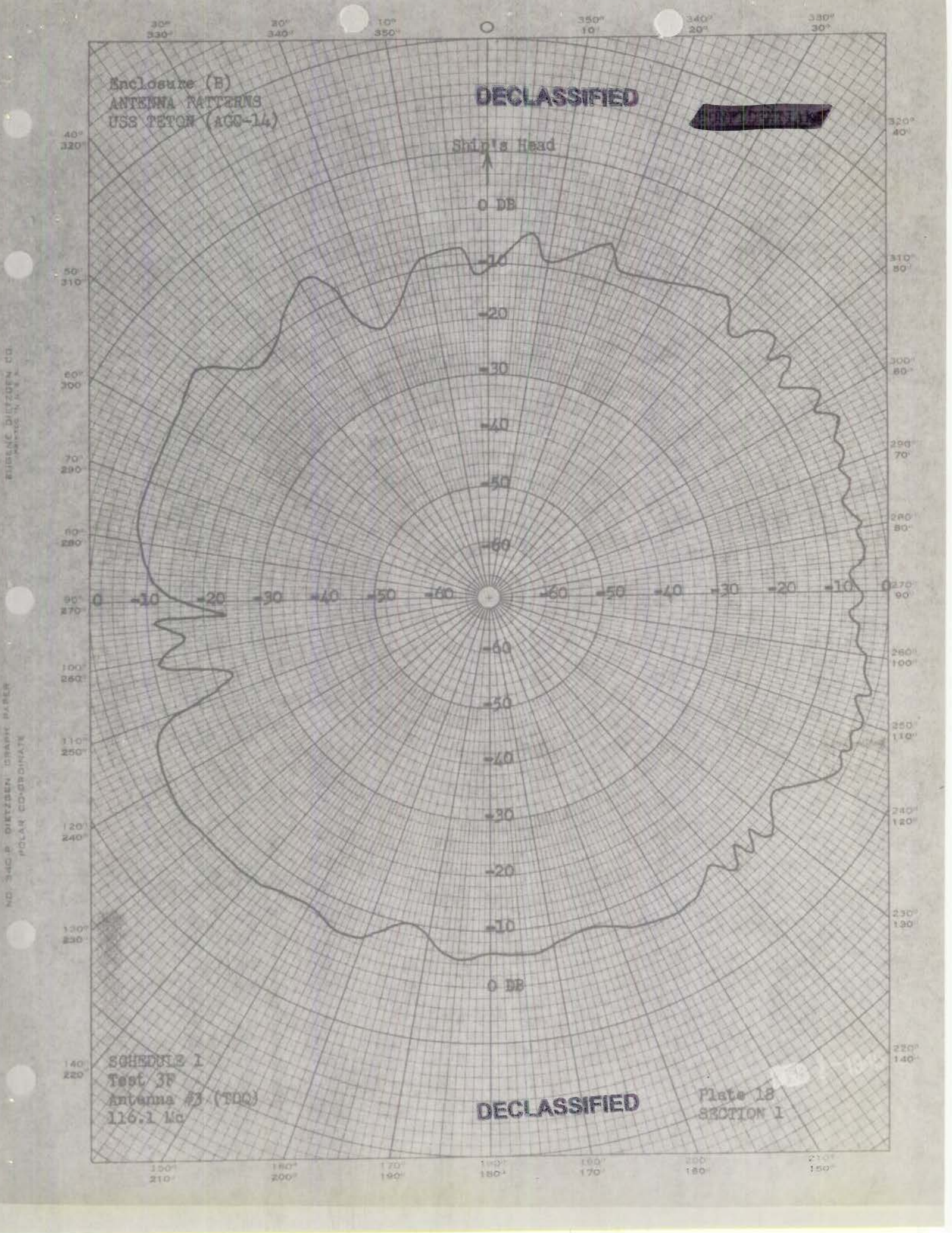


SCHEDULE 1
Test 3F
Antenna #3 (TQC)
116.1 Mc

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Plate 18
SECTION 1

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USS TETON (AGC-14)

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0 DB

-5

-10

-15

-20

-25

-30

-30

-25

-20

-15

-10

-5

0 DB

EURELC DIETZGEN CO.
PRINTED IN U.S.A.

NO. 240 R. DIETZGEN DRAWING PAPER
POLAR CO-ORDINATE

SCHEME 1
Test 4A
Antenna #19 (TBL)
2800 kc
0 DB = 20,000 uv/m

DECLASSIFIED

Plate 19
SECTION 1

FEB 1 1948

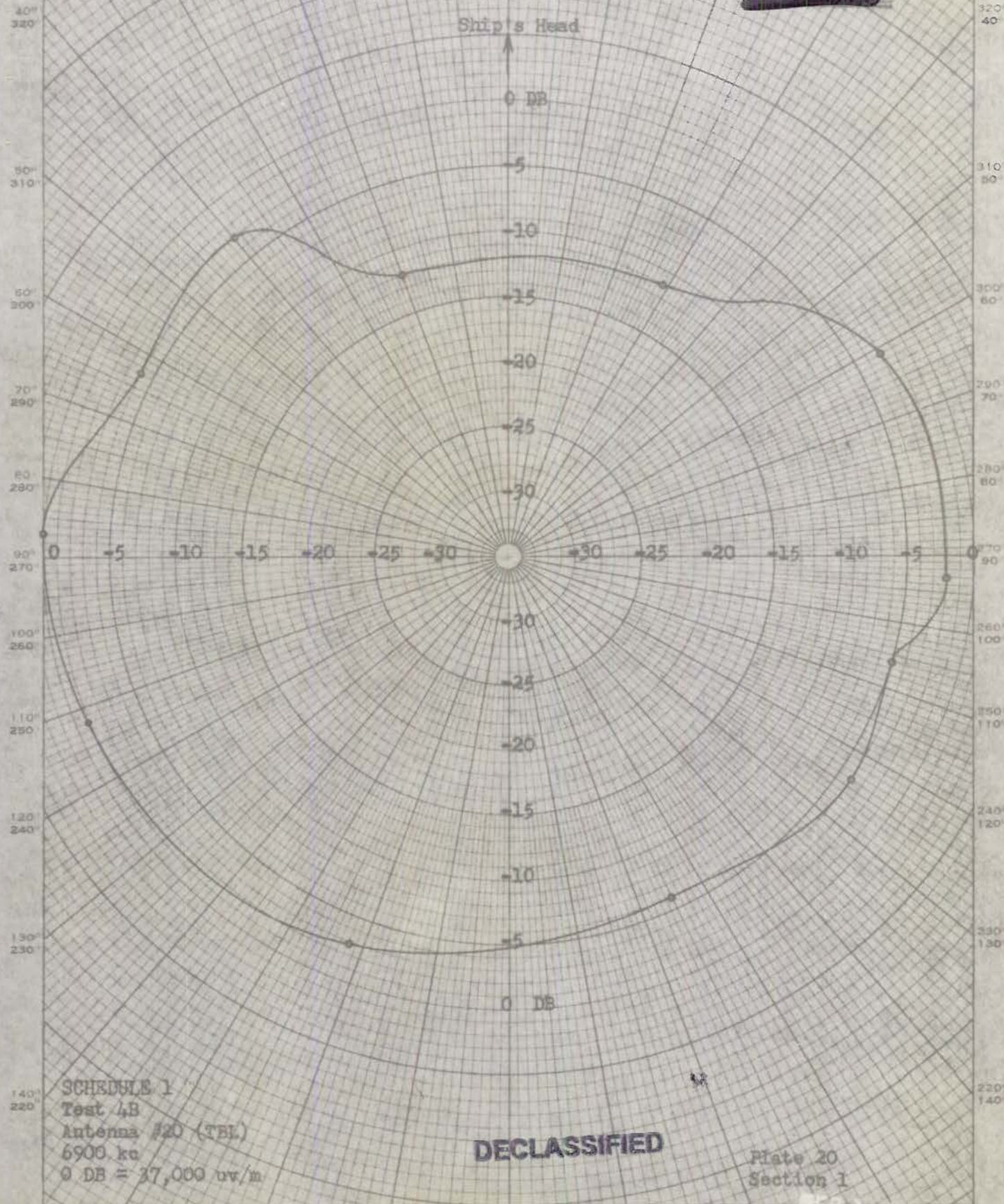
150° 160° 170° 180° 190° 200° 210° 180° 170° 160° 150°

Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-14)

DECLASSIFIED



Ship's Head
↑



SCHEDULE 1
Test 4B
Antenna #20 (TBL)
6900 kc
0 DB = 37,000 uv/m

DECLASSIFIED

Plate 20
Section 1

ELMER DIETZEN CO.
DIVISION OF U.S.A.

NO. 3804 DIETZEN SHAW WAPER
POLAR COORDINATE

150° 160° 170° 180° 190° 200° 210° 220° 230° 240° 250° 260° 270° 280° 290° 300° 310° 320° 330° 340° 350° 360°

Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-14)

DECLASSIFIED



Ship's Head
↑

0 DB

-5

-10

-15

-20

-25

-30

-35

-40

-45

-50

-55

-60

-65

-70

-75

-80

-85

-90

SCHEDULE 1
Test 40
Antenna 49(29) TBL
8200 kc
0 DB = 5A, 600 uv/m

DECLASSIFIED

Plate 21
SECTION 1

FEB 1-1945

ENGINEERING DRAWING CO.
WASHINGTON, D.C.

NO. 340-B CHRISTENSEN GRAPH PAPER
POLAR COORDINATE

Enclosure (B)
ANTENNA PATTERNS
USS TETON (ACC-14)

DECLASSIFIED



Ship's Head
↑

0 DB

+5

+10

+15

+20

+25

+30

+30

+25

+20

+15

+10

+5

0 DB

SCHEDULE 1
Test 4D
Antenna #7(27) TEB
10,000 kc
0 DB = 34,700 uv/m

DECLASSIFIED

Plate 22
SECTION 1

EUGENE DIETZGEN CO.
24 WEST 14 ST. N. Y. N. Y.

NO. 3-40 R. DIETZGEN DESIGN PAPER
POLAR CO-ORDINATE

40°
320

50°
310

60°
300

70°
290

80°
280

90°
270

100°
260

110°
250

120°
240

130°
230

140°
220

320°
40°

310°
50°

300°
60°

290°
70°

280°
80°

270°
90°

260°
100°

250°
110°

240°
120°

230°
130°

220°
140°

150°
210°

160°
200°

170°
190°

180°
180°

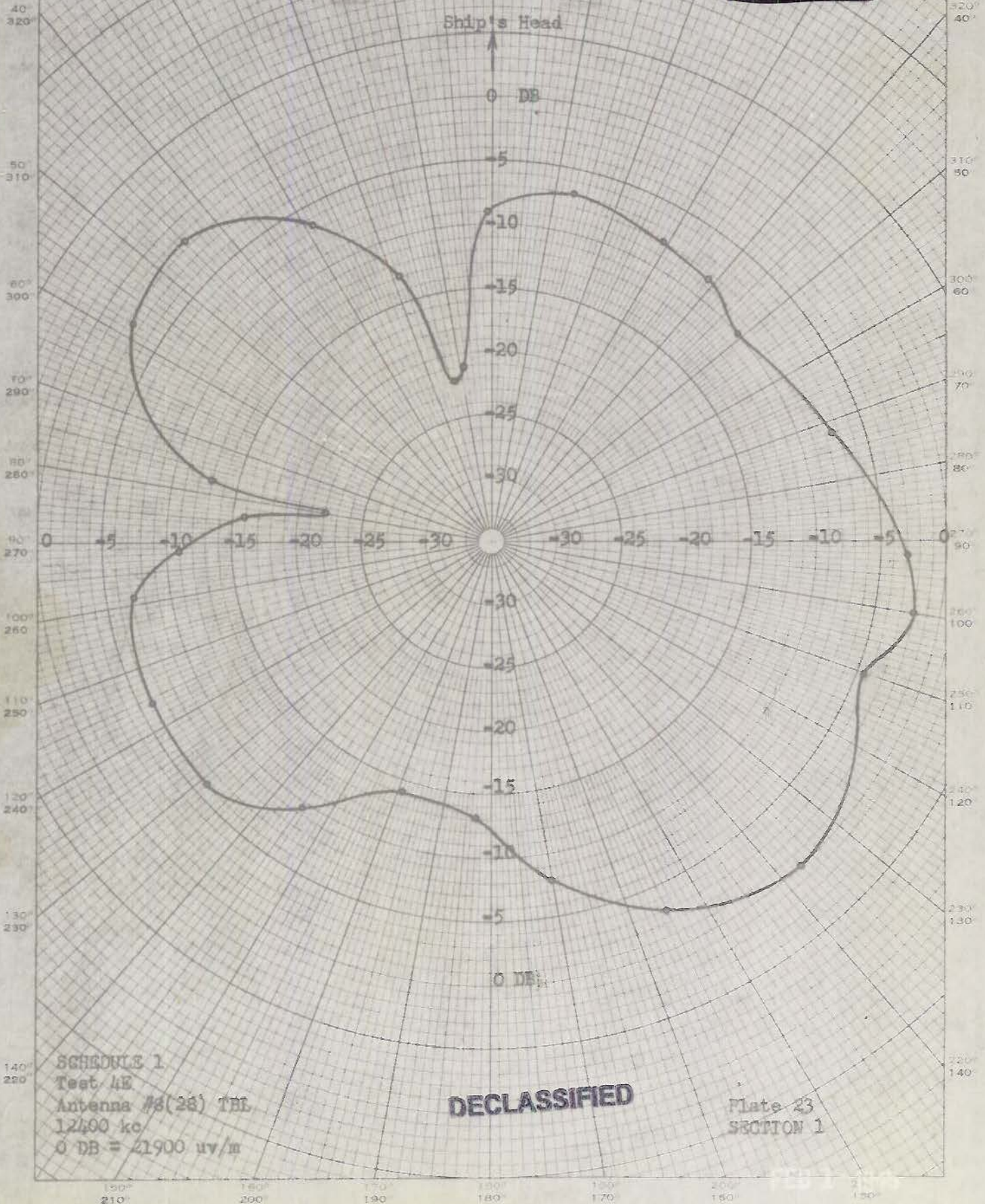
190°
170°

200°
160°

210°
150°

Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-14)

DECLASSIFIED



EUGENE DIETZEN CO.
PAPER IN U.S.A.

NO. 340-P DIETZEN GRAPH PAPER
POLAR COORDINATE

Enclosure (B)
USS TETON (AGC-14)
ANTENNA PATTERNS

DECLASSIFIED



Ship's Head

0 DB

-10

-20

-30

-40

-50

-60

-60

-50

-40

-30

-20

-10

0 DB

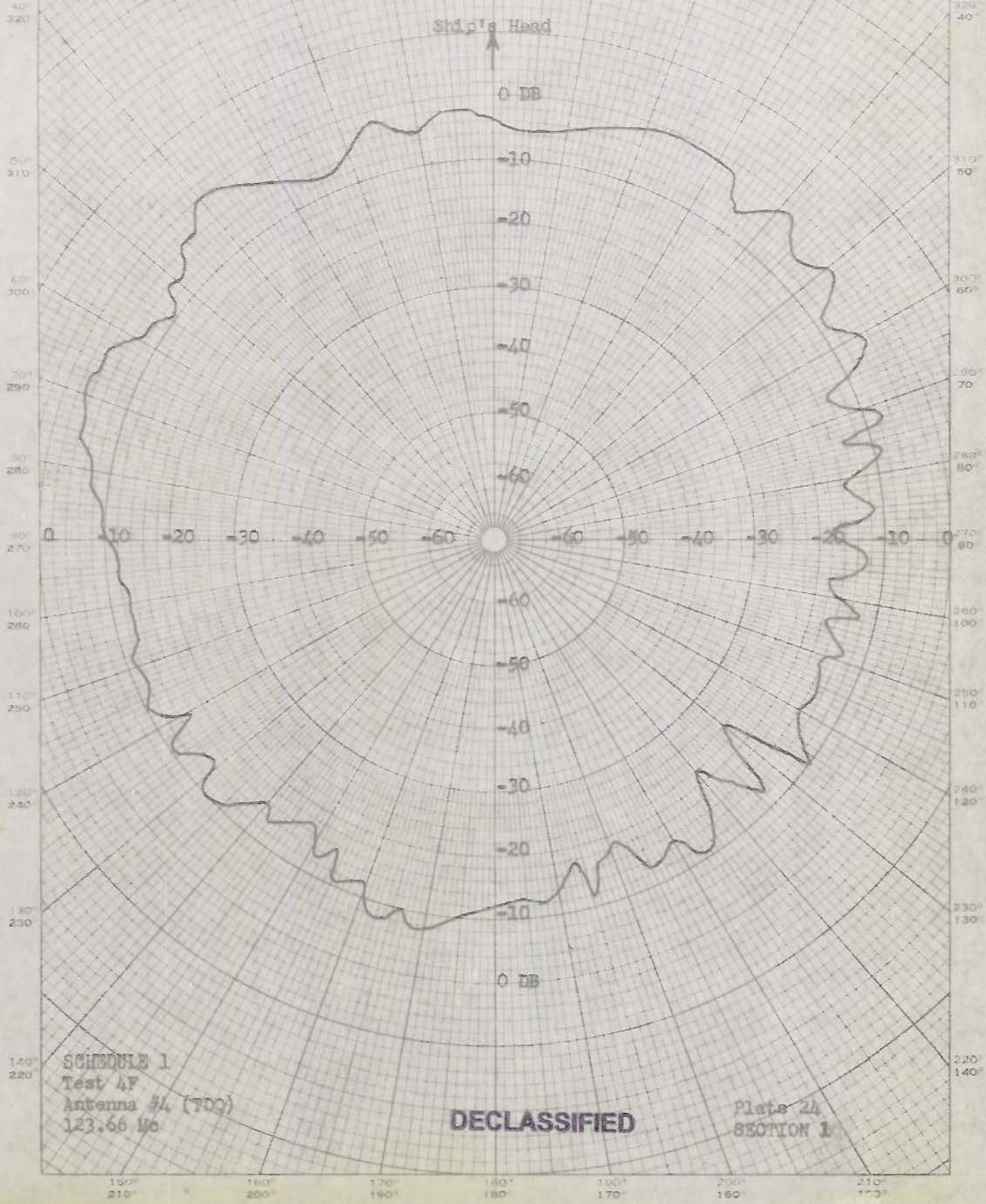
0 -10 -20 -30 -40 -50 -60 -60 -50 -40 -30 -20 -10 0

SCHEDULE 1
Test 4F
Antenna #4 (TDC)
123.66 Mc

DECLASSIFIED

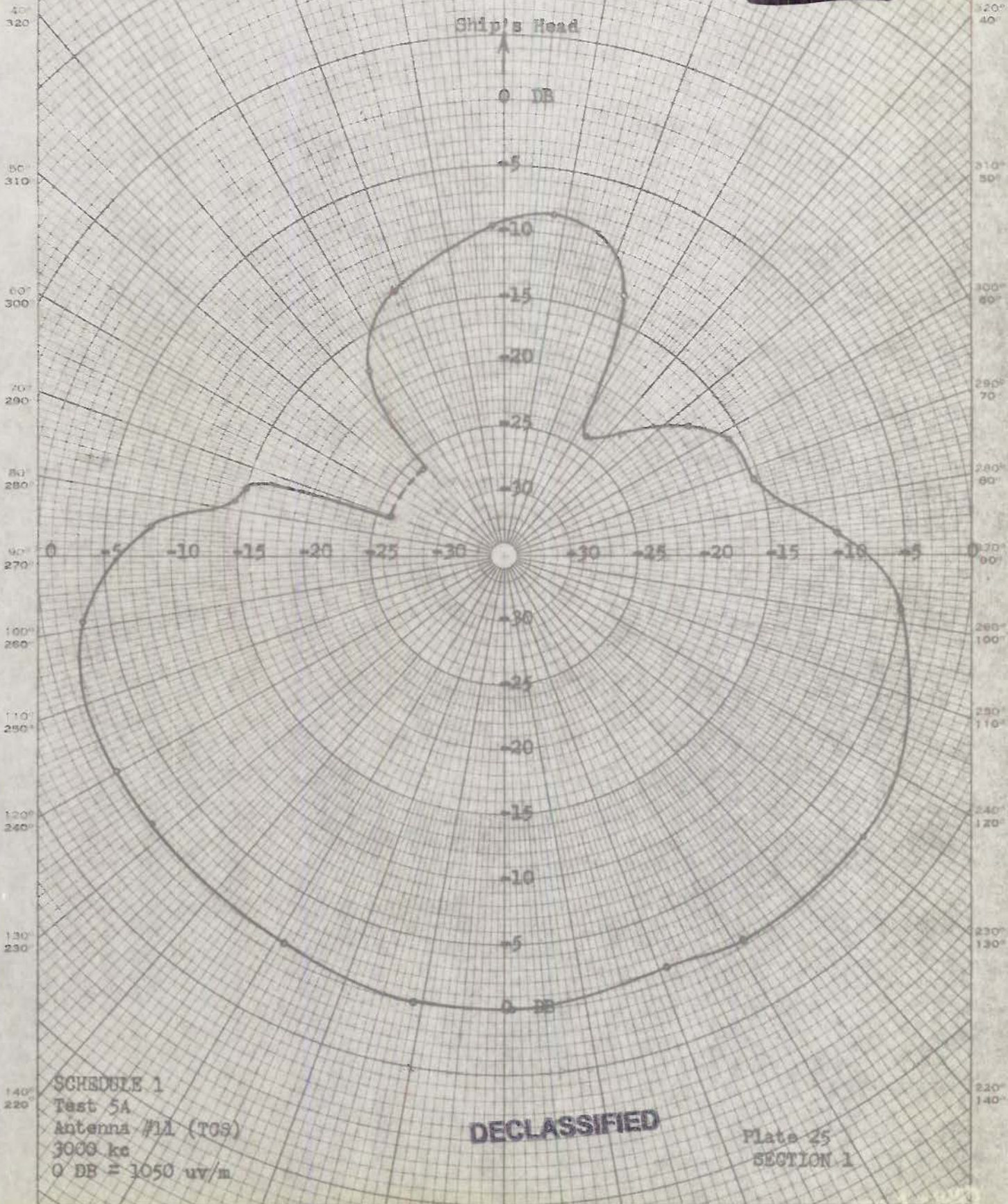
Plate 24
SECTION 1

ENGINE OVERSEEN CO.
NO. 34018 BILTZEN BRUSH PAPER
POLAR COORDINATE



Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-14)

DECLASSIFIED



SCHEDULE 1
Test 5A
Antenna #1A (TOS)
3000 kc
0 DB = 3050 uv/m

DECLASSIFIED

Plate 25
SECTION 1

NO. 310-P DIETZGEN GRAPH PAPER
RELAY CO-ORDINATE

EUGENE DIETZGEN, DBY
PHOTO LITH. U.S.A.

Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-14)

DECLASSIFIED

Ship's Head
↑

0 DB

-5

-10

-15

-20

-25

-30

-30

-25

-20

-15

-10

-5

0 DB

SCHEDULE 1
Test 5B
Antenna #7 (TDE)
1100 kc

DECLASSIFIED

Plate 26
SECTION 1

NO. 340-P DIEZELN GRAPH PAPER
POLAR CO-ORDINATE

40° 320°
50° 310°
60° 300°
70° 290°
80° 280°
90° 270°
100° 260°
110° 250°
120° 240°
130° 230°
140° 220°

320° 40°
310° 50°
300° 60°
290° 70°
280° 80°
270° 90°
260° 100°
250° 110°
240° 120°
230° 130°
220° 140°

150° 210° 160° 200° 170° 190° 180° 180° 170° 160° 150°

Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-14)

DECLASSIFIED



Ship's Head
↑

0 DB

-5

-10

-15

-20

-25

-30

-30

-25

-20

-15

-10

-5

0 DB

NO. 3308 CRETZEN GRAPH BOARD
POLAR COORDINATE

SCHEDULE 1
Test 5C
Antenna #10 (TDS)
9100 kc
0 DB = 38000 uv/m

DECLASSIFIED

Plate 27
SECTION 1

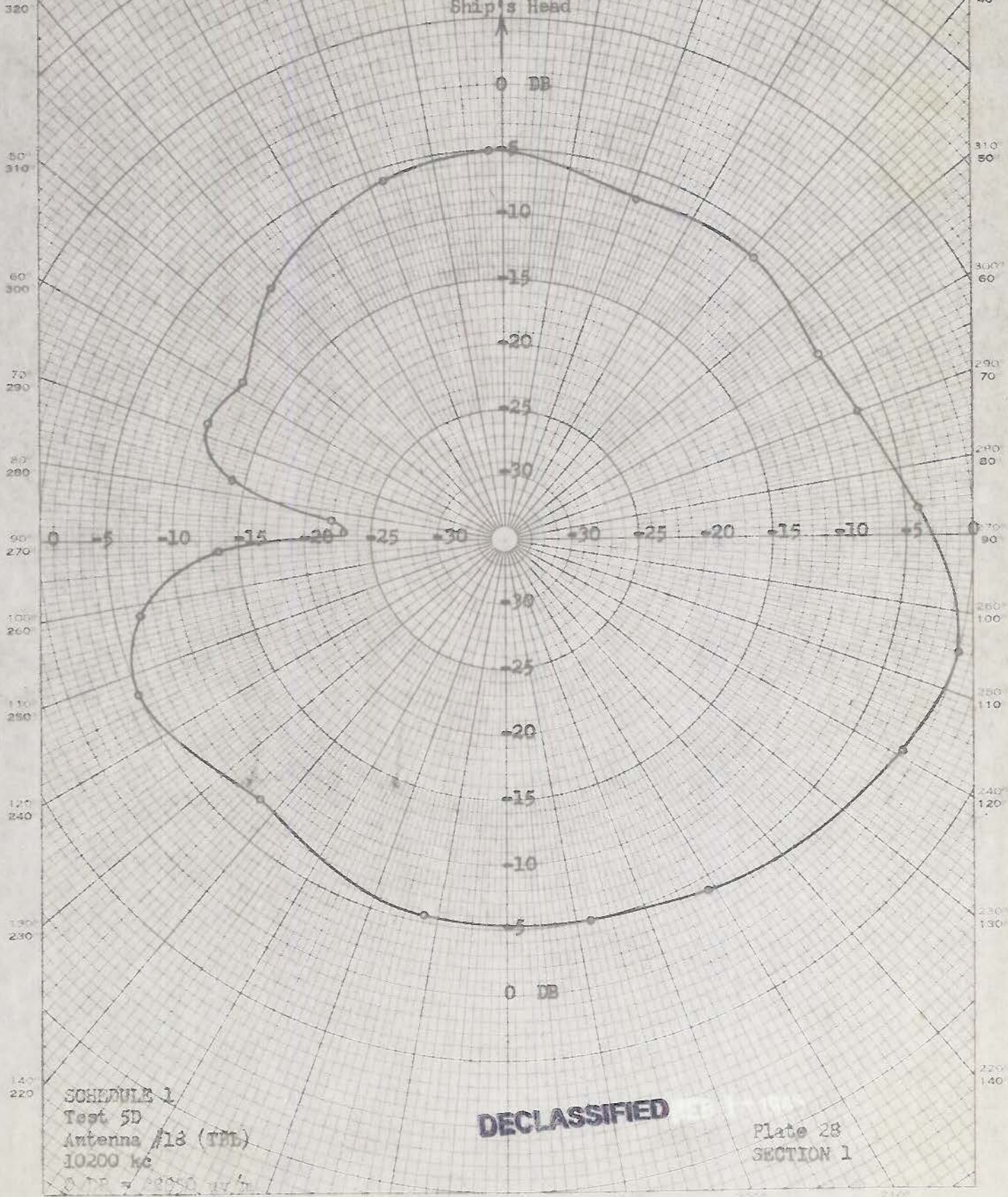
150° 160° 170° 180° 190° 200° 210°
210° 200° 190° 180° 170° 160° 150°

Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-14)

DECLASSIFIED



Ship's Head
↑



SCHEDULE 1
Test 5D
Antenna #13 (TDL)
10200 kc
0.75 - 20000 W/A

DECLASSIFIED

Plate 28
SECTION 1

NO. 3400 DIETZEN GRAPH PAPER
E. DIETZEN CO. NEW YORK, N.Y.

Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-14)

DECLASSIFIED



Ship's Head
↑

0 DB

-10

-20

-30

-40

-50

-60

-60

-50

-40

-30

-20

-10

0 DB

0 -10 -20 -30 -40 -50 -60 -60 -50 -40 -30 -20 -10 0

SCHEDULE 1
Test 5F
Antenna #5 (TQ2)
140.58 Mc

DECLASSIFIED

Plate 29
SECTION 1

EUBENE DIETZGEN, CO.
Model No. 100-10-1

NO. 340-P DIETZGEN GRAPH TABLE
POLAR COORDINATE

40°
320°
30°
310°
20°
300°
10°
290°
0°
280°
-10°
270°
-20°
260°
-30°
250°
-40°
240°
-50°
230°
-60°
220°

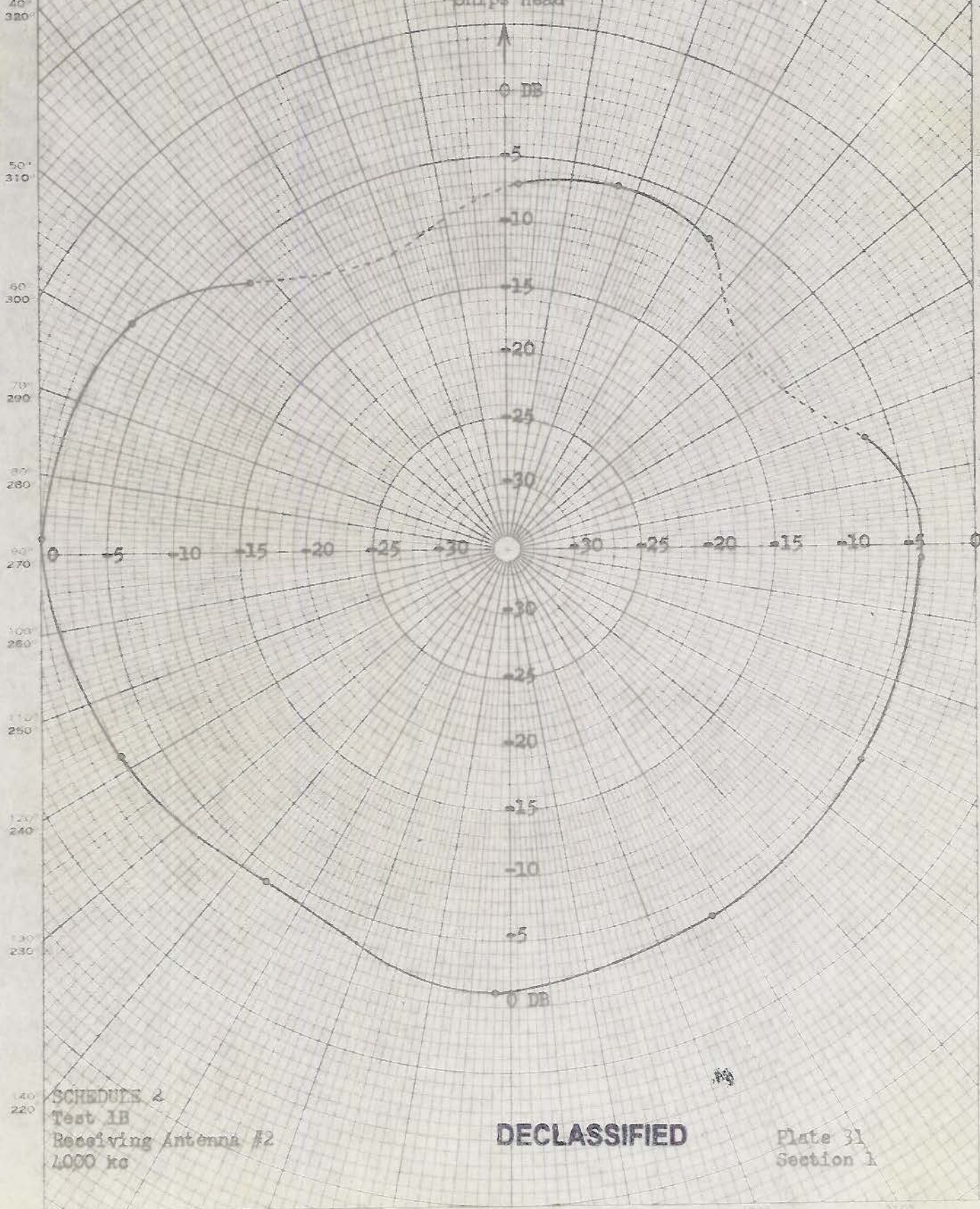
320°
40°
310°
50°
300°
60°
290°
70°
280°
80°
270°
90°
260°
100°
250°
110°
240°
120°
230°
130°
190°
220°
140°

150° 210° 160° 200° 170° 190° 180° 180° 190° 170° 200° 160° 310° 150°

Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-14)

DECLASSIFIED

Ship's Head



EUGENE DIETZEN CO.
P.O. BOX 112
MILWAUKEE, WIS.

NO. 3504 DIETZEN GRAPH PAPER
POLAR COORDINATE

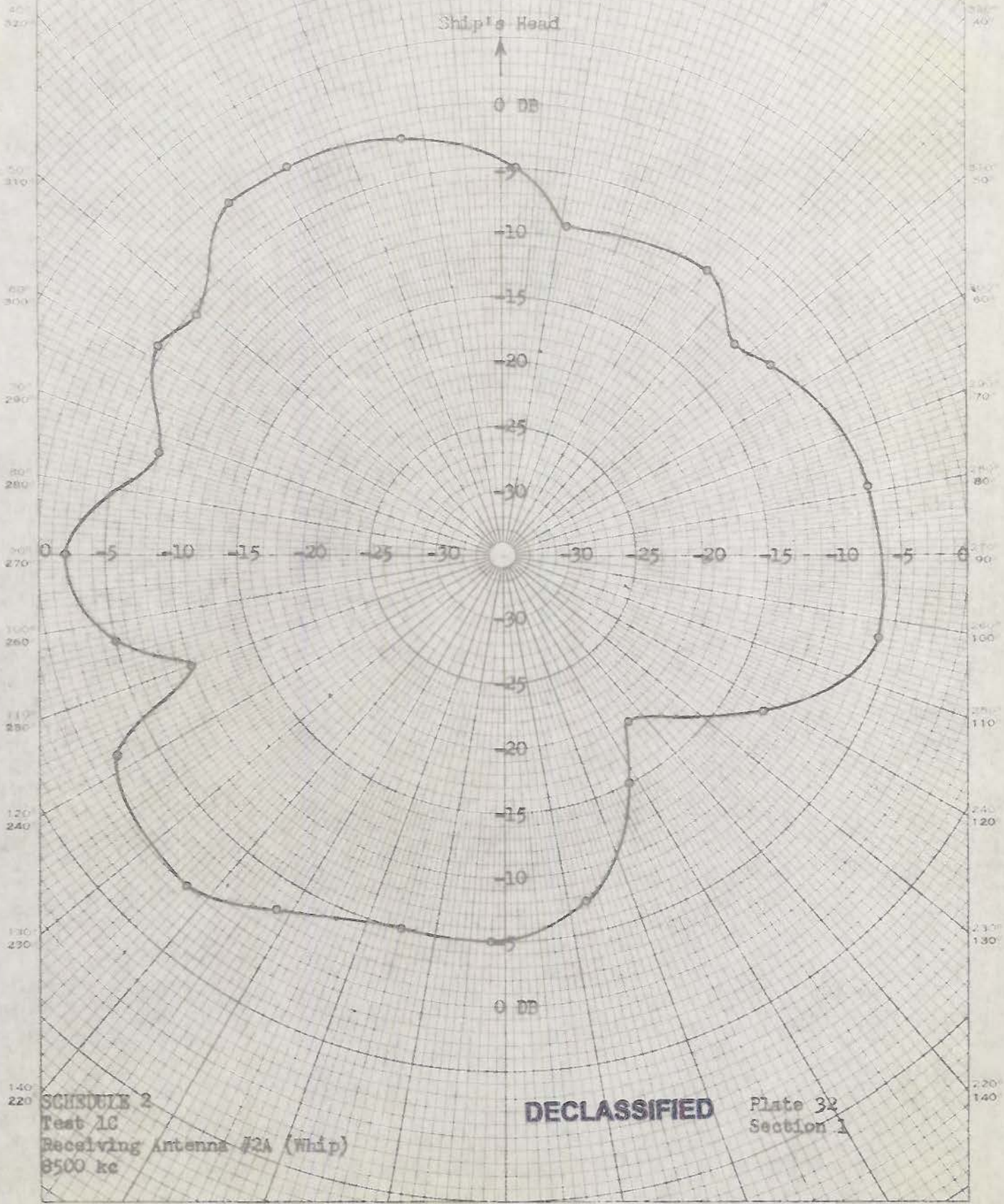
SCHEDULE 2
Test 1B
Receiving Antenna #2
4000 kc

DECLASSIFIED

Plate 31
Section 1

DECLASSIFIED

Enclosure (F)
ANTENNA PATTERNS
USS TSTON (AGC-14)



NO. 340-B DIETZGEN BRAND PAPER
POLAR COORDINATE

SCHEDULE 2
Test 1C
Receiving Antenna #2A (Whip)
8500 kc

DECLASSIFIED

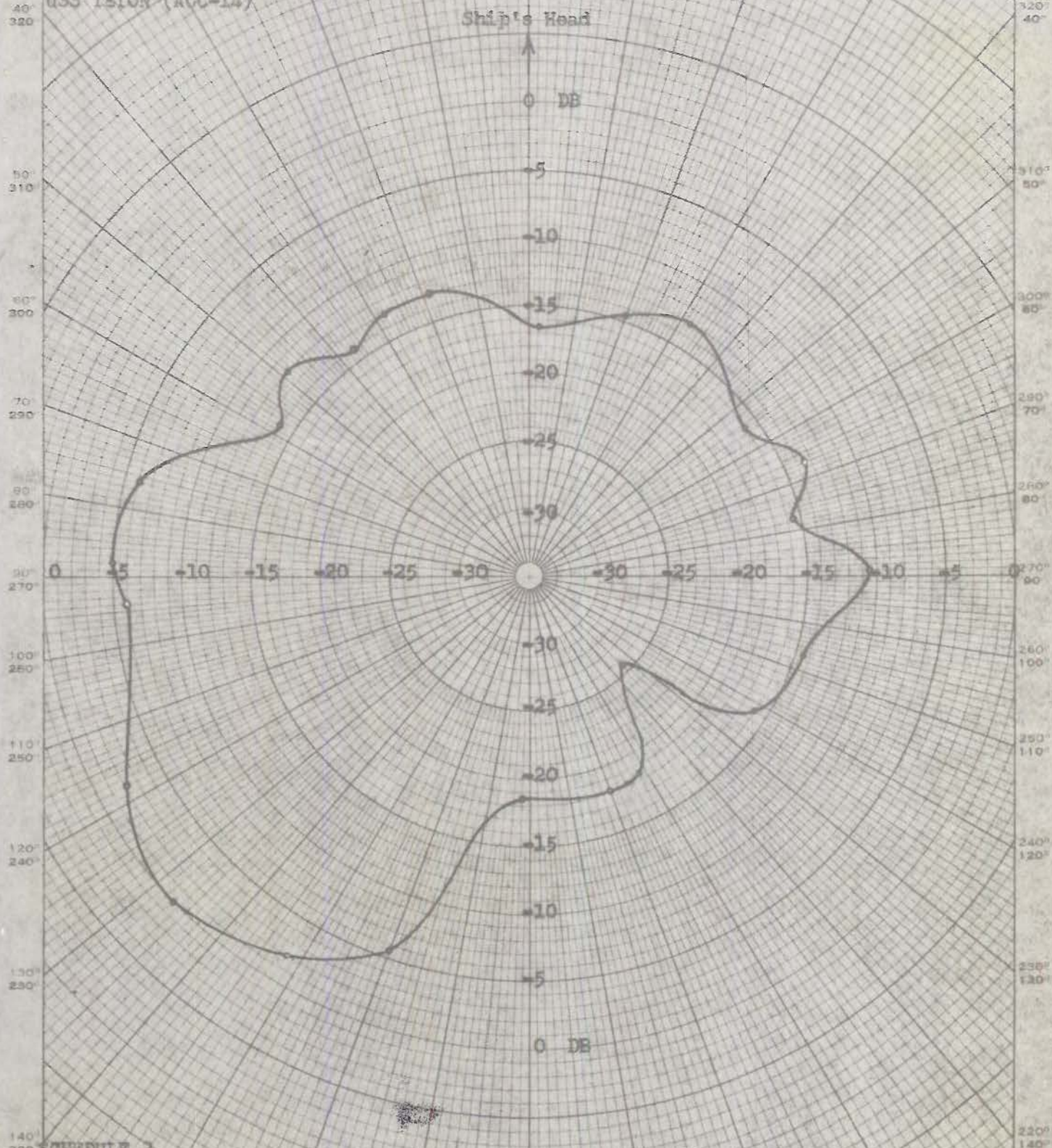
Plate 32
Section 1

FEB 1 1945

Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-14)

DECLASSIFIED

Ship's Head
↑



SCHEDULE 2
Test ID
Receiving Antenna #3
13500 kc

DECLASSIFIED

Plate 33
SECTION I

ENCLOSURE (B) ANTENNA PATTERNS USS TETON (AGC-14)

Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-14)

DECLASSIFIED

Ship's Head



0 DB

-10

-20

-30

-40

-50

-60

-70

-80

-90

-100

-110

-120

-130

-140

-150

-160

-170

-180

-190

-200

-210

-220

-230

SCHEDULE 2
Test 1E
Fwd. TBS
72.1 Mc

DECLASSIFIED

Plate 34
SECTION 1

ESSENTIAL DESIGN CO

NO 340 P DIETZGEN DRAPH MAKER
401A DE-CORINATE

180
210

180
200

180
190

180
180

180
170

180
160

180
150

40
320

50
310

60
300

70
290

80
280

90
270

100
260

110
250

120
240

130
230

140
220

150
210

160
200

170
190

180
180

320
40

310
50

300
60

290
70

280
80

270
90

260
100

250
110

240
120

230
130

220
140

210
150

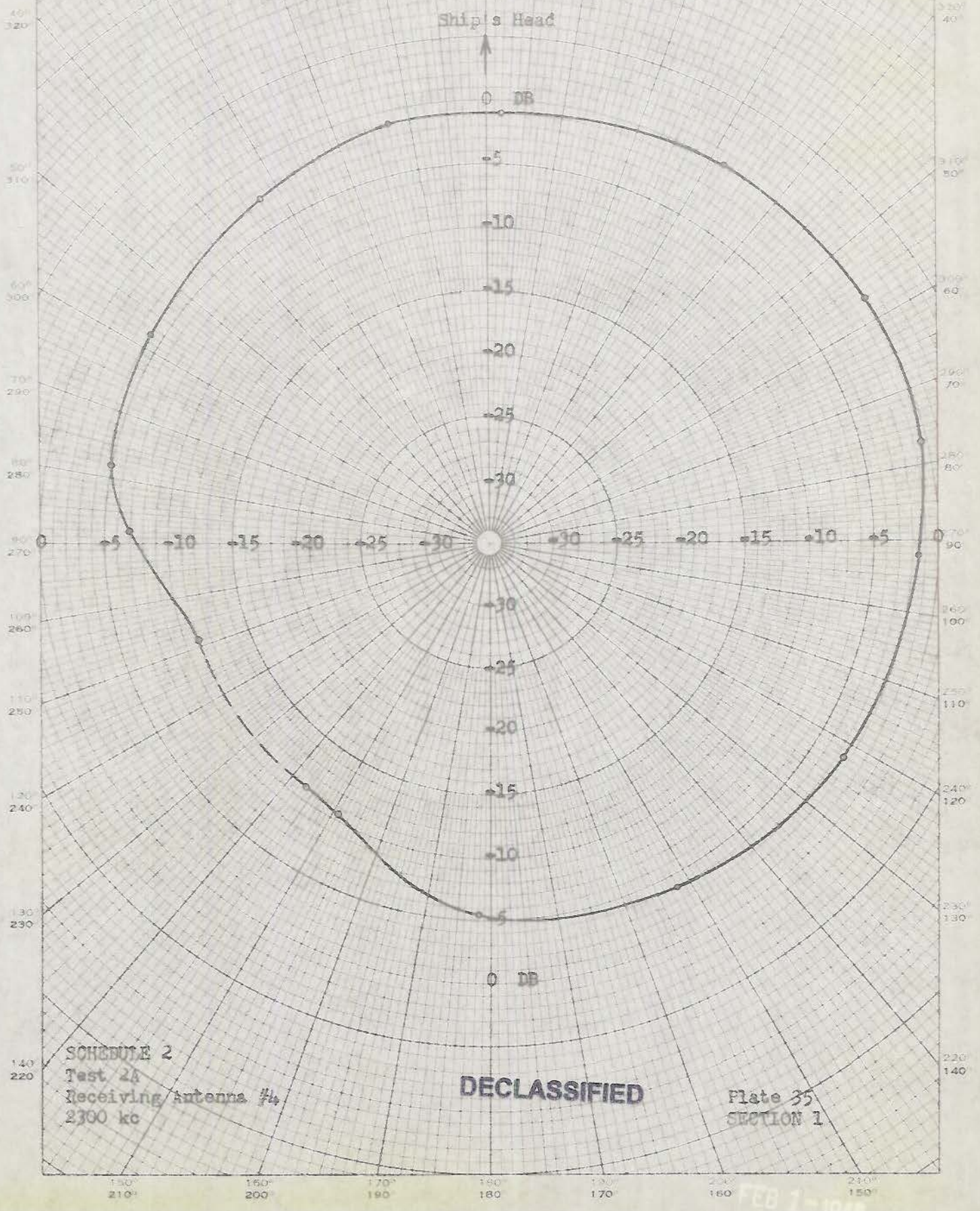
200
160

190
170

180
180

Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-14)

DECLASSIFIED



ENGINEERING DEPT.
NAVY OFFICE

NO. 340-P DYESEN DRAFT PAPER
POLAR COORDINATE

SCHEDULE 2
Test 24
Receiving Antenna #4
2300 kc

DECLASSIFIED

Plate 35
SECTION 1

FEB 1-1945

Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-14)

DECLASSIFIED

Ship's Head
↑

0 DB

-5

-10

-15

-20

-25

-30

-30

-25

-20

-15

-10

-5

0 DB

SCHEDULE 2
Test 2B
Receiving Antenna #5
4000 kc

DECLASSIFIED

Plate 36
SECTION 1

FEB 1 - 1945

EUGENE CRITZBEN CO.
PRINTED IN U.S.A.

NO. 340 - CRITZBEN GRAPH PAPER
POLAR COORDINATE

150° 210° 160° 200° 170° 190° 180° 180° 170° 200° 160° 150°

40° 320°

50° 310°

60° 300°

70° 290°

80° 280°

90° 270°

100° 260°

110° 250°

120° 240°

130° 230°

140° 220°

320° 40°

310° 50°

300° 60°

290° 70°

280° 80°

270° 90°

260° 100°

250° 110°

240° 120°

230° 130°

220° 140°

Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-14)

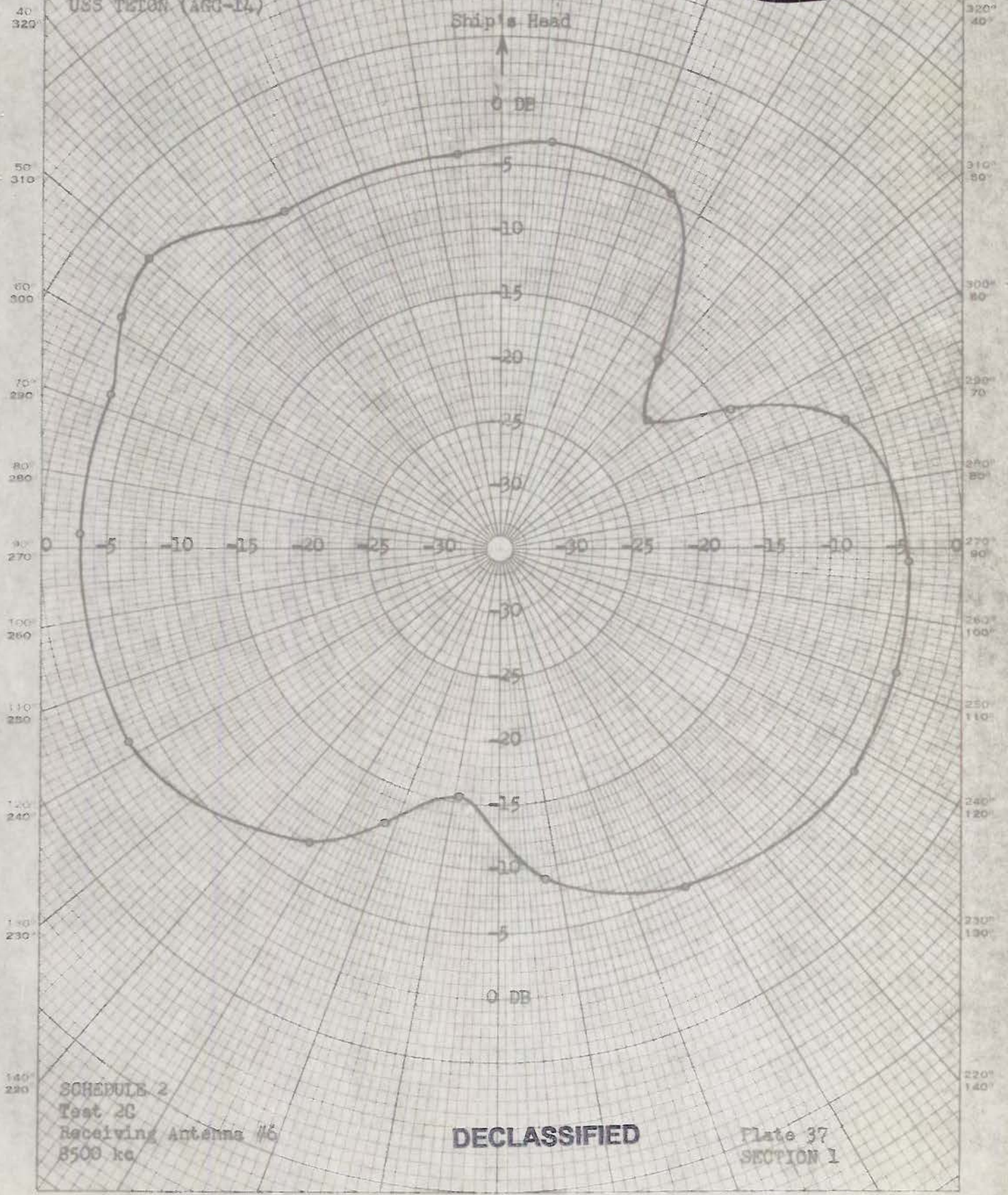
DECLASSIFIED



Ship's Head



0 DB



SCHEDULE 2
Test 2C
Receiving Antenna #6
8500 kc

DECLASSIFIED

Plate 37
SECTION 1

190° 210° 160° 200° 170° 190° 180° 160° 170° 200° 210° 150°

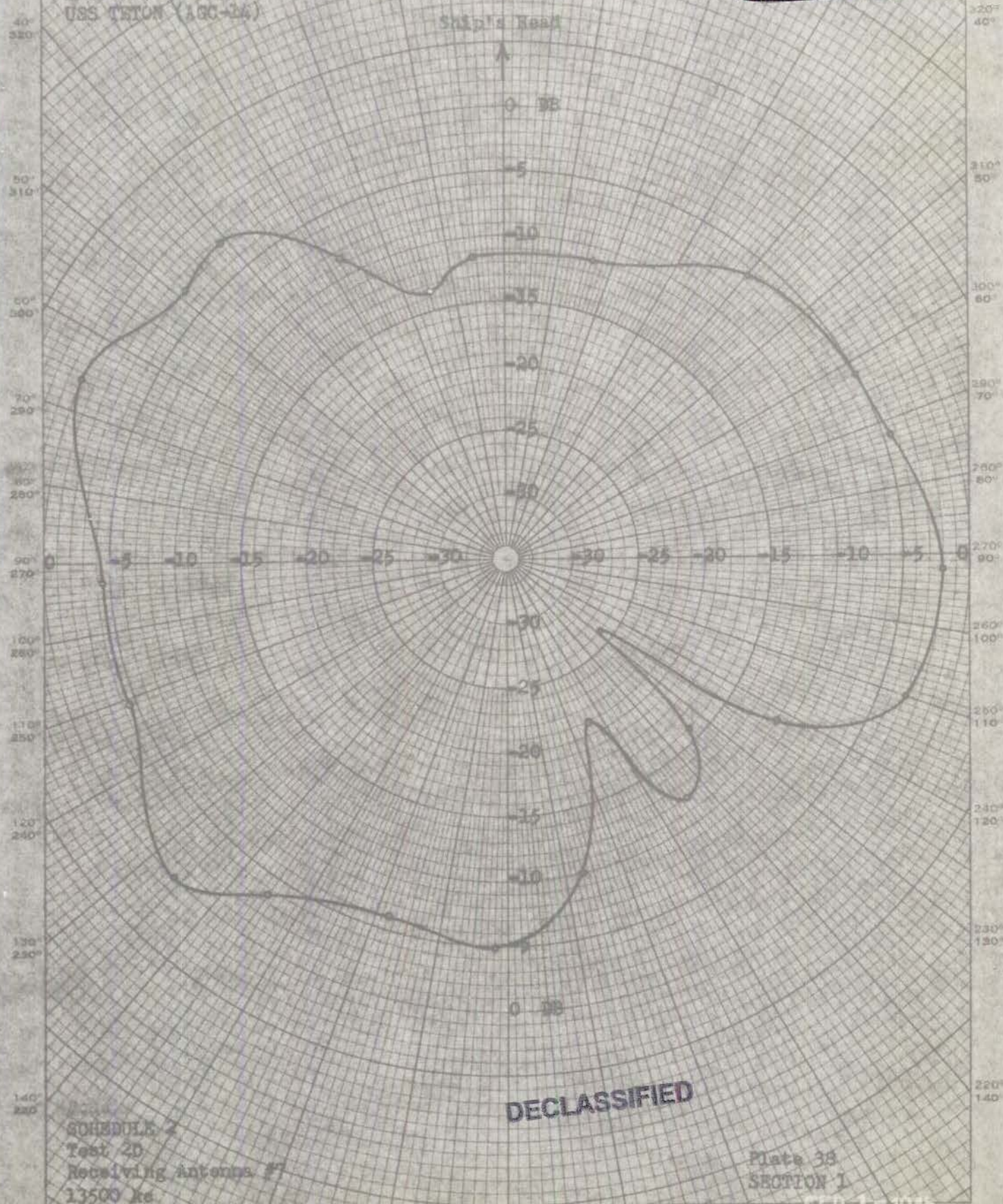
NO. 340-A DIETZGEN GRAPH PAPER
POLAR COORDINATE
EUGENE DIETZGEN CO.
ANN ARBOR, MICH.

DECLASSIFIED

Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-24)



Ship's Head
↑



DECLASSIFIED

SCHEDULE 4
Test 2D
Receiving Antenna #1
13500 kc

Plate 38
SECTION 1

FEB 1 1945

NO. 340-P DIETZGEN GRAPH PAPER
POLAR CO-ORDINATE
EUGENE DIETZGEN CO.
ANN ARBOR, U.S.A.

30° 330° 20° 340° 10° 200° 350° 10° 340° 20° 330° 30° 210° 180° 170° 160° 150° 140° 130° 120° 110° 100° 90° 80° 70° 60° 50° 40° 30° 20° 10° 0° 10° 20° 30° 40° 50° 60° 70° 80° 90° 100° 110° 120° 130° 140° 150° 160° 170° 180° 190° 200° 210°

Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-14)

DECLASSIFIED

Ship's Head
↑

0 DB

-10

-20

-30

-40

-50

-60

-70

-80

-90

-100

-110

-120

-130

-140

-150

-160

-170

-180

DECLASSIFIED

Plate 39
SECTION 1

SCHEDULE 2
Test 2E
Aft. TBS
72.4 Mc

EUBANK DIETZGEN P/B
PRINTED IN U.S.A.
NO. 340 P. DIETZGEN GRAPH PAPER
POLAR COORDINATE

40° 320°
50° 310°
60° 300°
70° 290°
80° 280°
90° 270°
100° 260°
110° 250°
120° 240°
130° 230°
140° 220°

320° 40°
310° 50°
300° 60°
290° 70°
280° 80°
270° 90°
260° 100°
250° 110°
240° 120°
230° 130°
220° 140°

150° 210° 160° 200° 170° 190° 180° 170° 190° 200° 160° 210° 150°

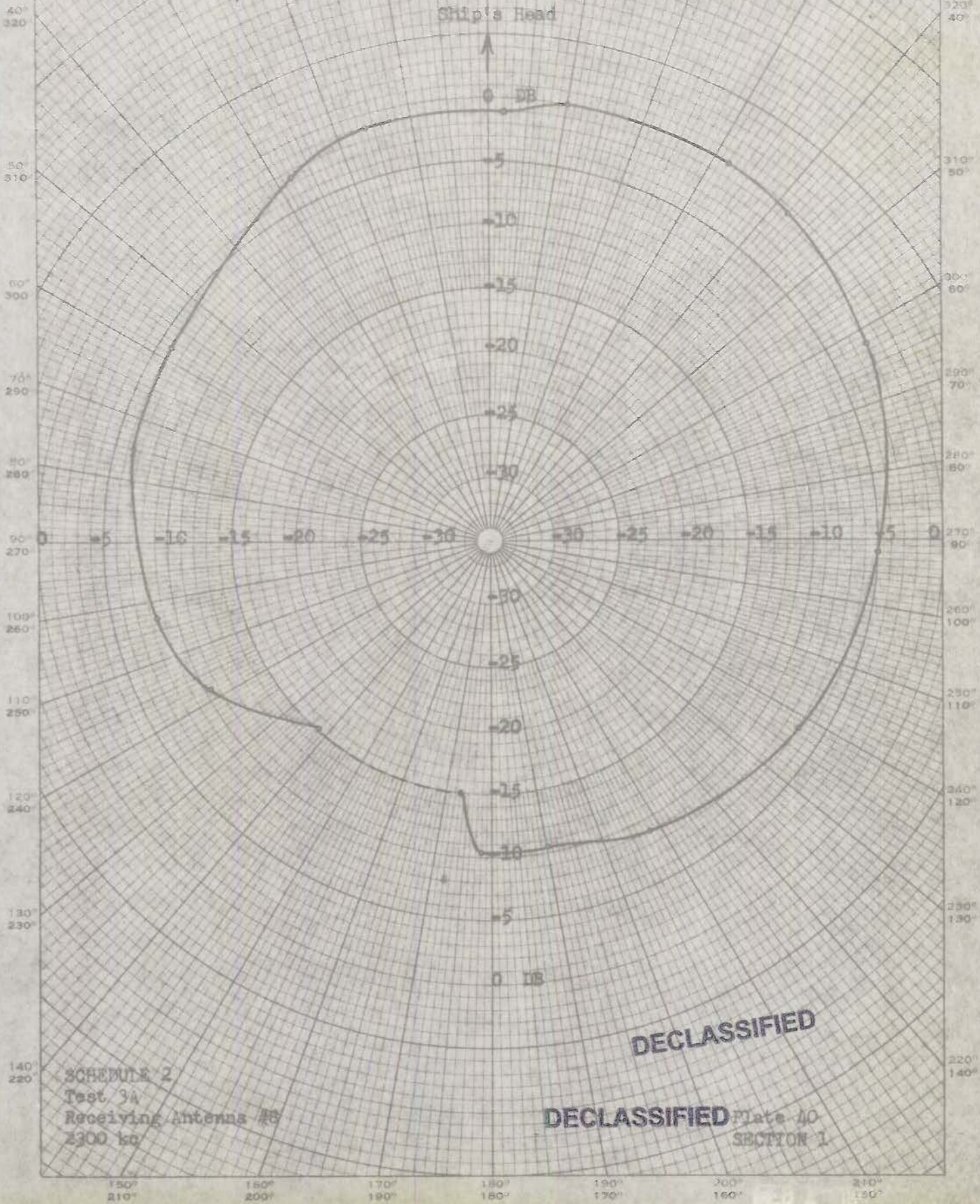
301-1025

DECLASSIFIED

Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-1A)

DECLASSIFIED

Ship's Head
↑



NO. 340-P DITIZEN GRAPH PAPER
POLAR COORDINATE

NO. 340-P DITIZEN GRAPH PAPER
POLAR COORDINATE

SCHEDULE 2
Test 3A
Receiving Antenna #8
2300 kc

DECLASSIFIED

DECLASSIFIED Plate 40
SECTION 1

DECLASSIFIED

Enclosure (B)
ANTENNA PATTERNS
USS TINTON (AGC-14)



Ship's Head
↑

0 DB

-5

-10

-15

-20

-25

-30

-30

-30

-25

-20

-15

-10

-5

0 DB

0 -5 -10 -15 -20 -25 -30 -30 -25 -20 -15 -10 -5

SCHEDULE 2
Test 3B
Receiving Antenna #9
4000 kc

DECLASSIFIED

Plate 41
SECTION 1

150° 210° 160° 200° 170° 190° 180° 180° 190° 170° 200° 160°

FEB 4 1950

ELIENS, DIETZEN, CO.

NO. 340-P DIETZEN GRAPH PAPER
RELAB. OR REGRATE

Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-14)

DECLASSIFIED



Ship's Head
↑

0 DB

-10

-15

-20

-25

-30

-35

-40

-45

-50

-55

-60

-65

-70

-75

-80

-85

-90

SCHEME 2
Test 3C
Receiving antenna #10 (Ship)
8500 kc

Plate 42
SECTION 1

DECLASSIFIED

ESSENTIALITY CO

NO. 3408 DISTRICT GRAPH BOARD
POLAR COORDINATE

145°
220°

180°
210°

120°
40°

110°
50°

100°
60°

90°
70°

80°
80°

70°
90°

60°
100°

50°
110°

40°
120°

30°
130°

20°
140°

10°
150°

0°
160°

10°
170°

20°
180°

180°
210°

160°
200°

140°
190°

120°
180°

100°
170°

80°
160°

60°
150°

40°
140°

20°
130°

0°
120°

Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGO-14)

DECLASSIFIED



Ship's Head
↑

0 DB

-5

-10

-15

-20

-25

-30

-30

-25

-20

-15

-10

-5

0 DB

DECLASSIFIED

SCHEDULE 2
Test 3D
Receiving antenna #11
13500 kc

Plate 43
SECTION 1

EUGENE GREENEY CO.
NO. 340-B DIRECTOR GRAPH PAPERS
POLAR CO. ORIGINATE

40° 320°
50° 310°
60° 300°
70° 290°
80° 280°
90° 270°
100° 260°
110° 250°
120° 240°
130° 230°
140° 220°

320° 40°
310° 50°
300° 60°
290° 70°
280° 80°
270° 90°
260° 100°
250° 110°
240° 120°
230° 130°
220° 140°

150° 210° 160° 200° 170° 190° 180° 180° 190° 170° 200° 210° 150°

Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-14)

DECLASSIFIED



Ship's Head
↑

0 DB

-5

-10

-15

-20

-25

-30

-30

-25

-20

-15

-10

-5

0 DB

-5

-10

-15

-20

-25

-30

-30

-25

-20

-15

-10

-5

SCHEMATIC
Test 4A
Receiving Antenna #12
2300 kc

DECLASSIFIED

Plate 44
SECTION 1

RUSSIAN DISTANCE CHART MAPS
NO. 34018 DISTANCE CHART MAPS
NO. 34018 DISTANCE CHART MAPS

40
320
50
310
60
300
70
290
80
280
90
270
100
260
110
250
120
240
130
230
140
220

320
40
310
50
300
60
290
70
280
80
270
90
260
100
250
110
240
120
230
130
220
140

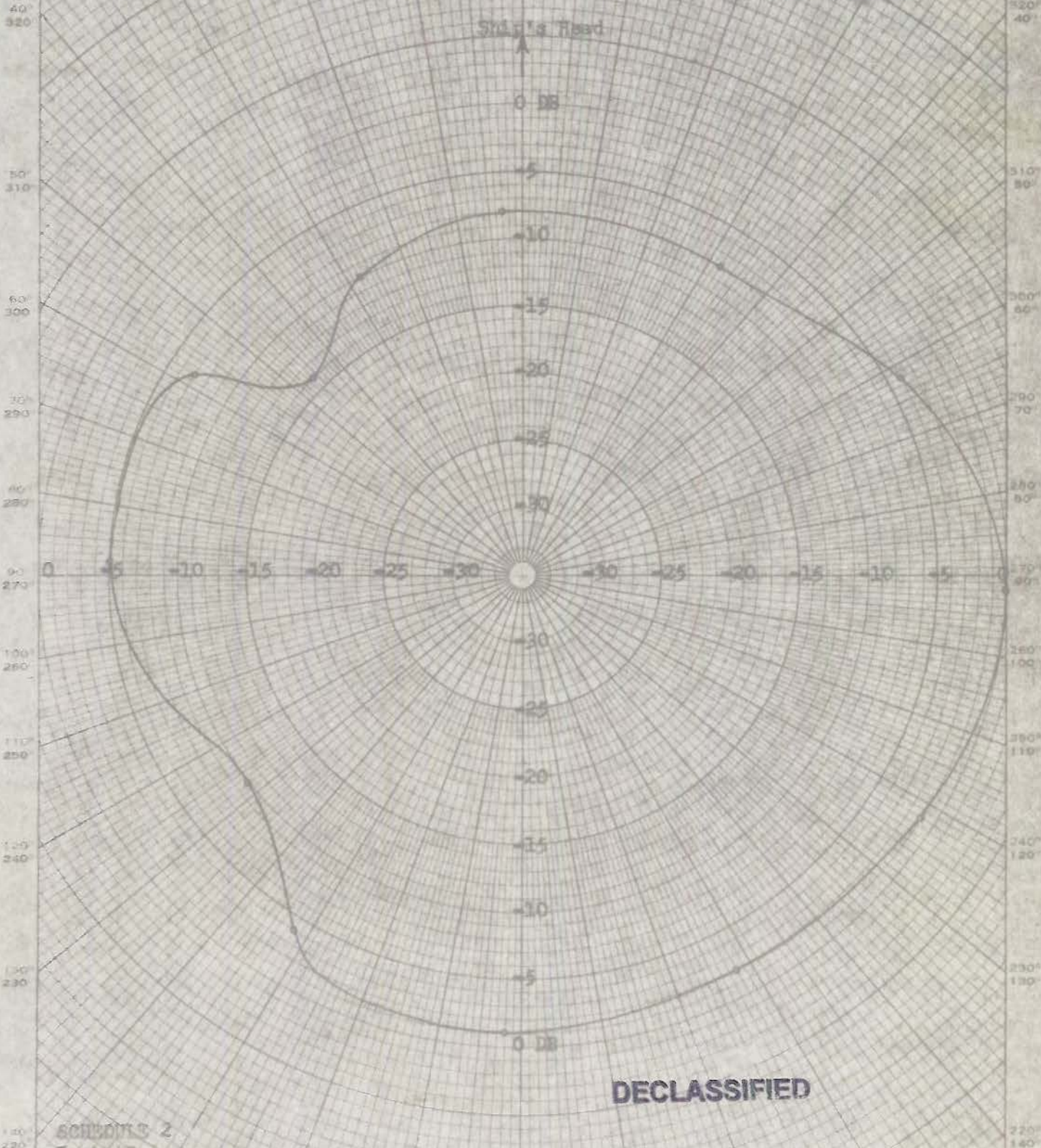
150° 210° 160° 200° 170° 190° 180° 180° 170° 160° 150°

DECLASSIFIED

Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-14)



NO. 340-F PLOTTER GRAPH PAPER
POLAR COORDINATE



DECLASSIFIED

SCHEMATIC 2
Test AB
Receiving Antenna #13 (W/APS)
4000 kc

Plate 45
SECTION 1

30° 20° 10° 0° 350° 340° 330° 320° 310° 300° 290° 280° 270° 260° 250° 240° 230° 220° 210° 200° 190° 180° 170° 160° 150°

DECLASSIFIED

Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-14)



Ship's Head

0 DB

-5

-10

-15

-20

-25

-30

-30

-25

-20

-15

-10

-5

0 DB

DECLASSIFIED

SCHEDULE 2
Test 4C
Receiving Antenna #1A
8500 ks

Plate 46
SECTION 1

NO. 340-B BRITISH GRAVH PAPER
RELAR COORDINATE

40° 130°
50° 210°
60° 290°
70° 270°
80° 250°
90° 270°
100° 230°
110° 250°
120° 240°
130° 230°
140° 220°

320° 40°
310° 50°
300° 60°
290° 70°
280° 80°
270° 90°
260° 100°
250° 110°
240° 120°
230° 130°
220° 140°

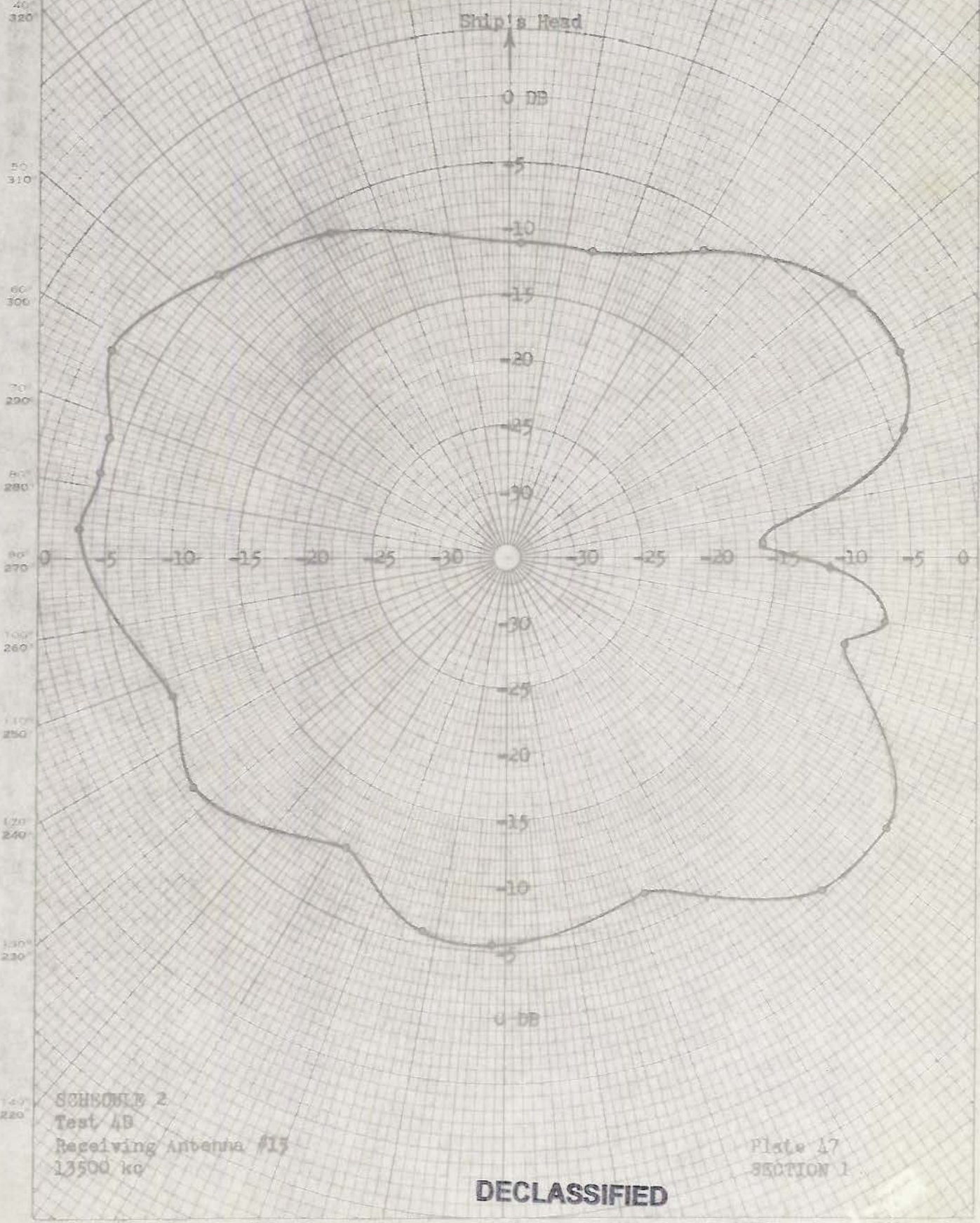
150° 210° 160° 200° 170° 190° 180° 180° 190° 170° 200° 160° 210° 150°

DECLASSIFIED

Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-14)



Ship's Head
↑



SONSOM 2
Test 4B
Receiving Antenna #15
13500 kc

Plate 47
SECTION 1

DECLASSIFIED

NO. 3-0-8 DIETZGEN GRAVURE MAYER
POLAR COORDINATE

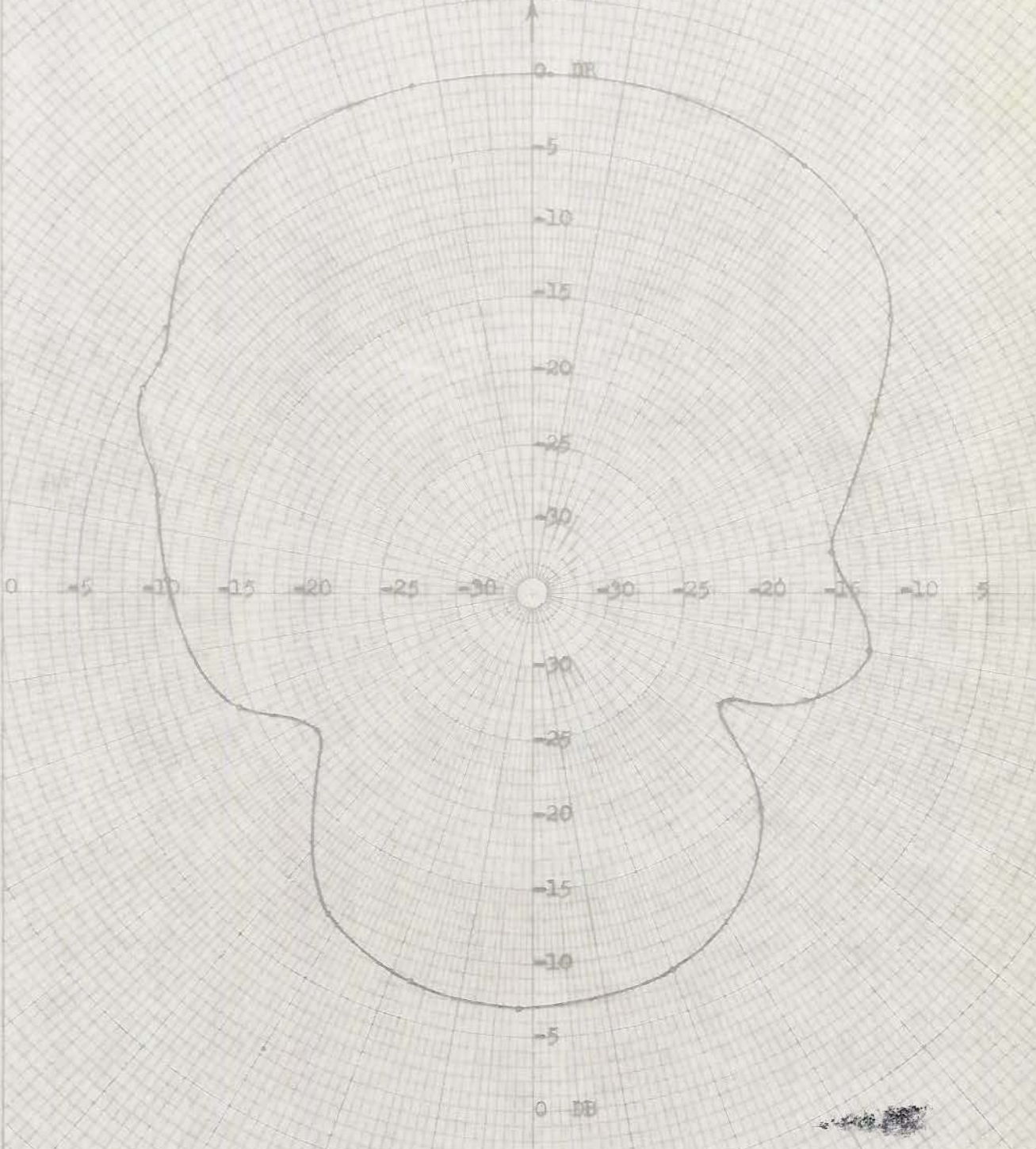
10° 20° 30° 40° 50° 60° 70° 80° 90° 100° 110° 120° 130° 140° 150° 160° 170° 180° 190° 200° 210° 220° 230° 240° 250° 260° 270° 280° 290° 300° 310° 320° 330° 340° 350° 360°

Envelope (B)
ANTENNA PATTERNS
USS TETON (AGC-14)

DECLASSIFIED



Ship's Head



SCHEDULE 2
Test 5A
Receiving Antenna #16
2300 kc

DECLASSIFIED

Plate 48
SECTION 1

NO. 340-F DIEZEL DRAWING PAPER
POLAR COORDINATE

150° 160° 170° 180° 190° 200° 210° 220°
20° 200° 190° 180° 170° 160° 150°

Enclosure (B)
ANTENNA PATTERNS
USS TEPON (AGOS-14)

DECLASSIFIED



Ship's Head
↑

0 DB

+5

+10

+15

+20

+25

+30

+30

+25

+20

+15

+10

+5

0 DB

SCHEDULE 2
Test 5B
Receiving Antenna #17
4000 kc

DECLASSIFIED

Plate 49
SECTION 1

150° 210° 160° 200° 170° 190° 180° 190° 170° 200° 180° 150°

FEB 1 1955

USNA WASHINGTON DC

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Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-14)

DECLASSIFIED



Ship's Head
↑

0 DB

-5

-10

-15

-20

-25

-30

-35

-40

-45

-50

-55

-60

-65

-70

-75

-80

-85

-90

0 DB

DECLASSIFIED

SCHEDULE 2
Test 5D
Receiving Antenna #19
13500 kc

Plate 51
SECTION 1

150° 160° 170° 180° 190° 200° 210° 220°

210° 200° 190° 180° 170° 160° 150°

FEB 1 1951

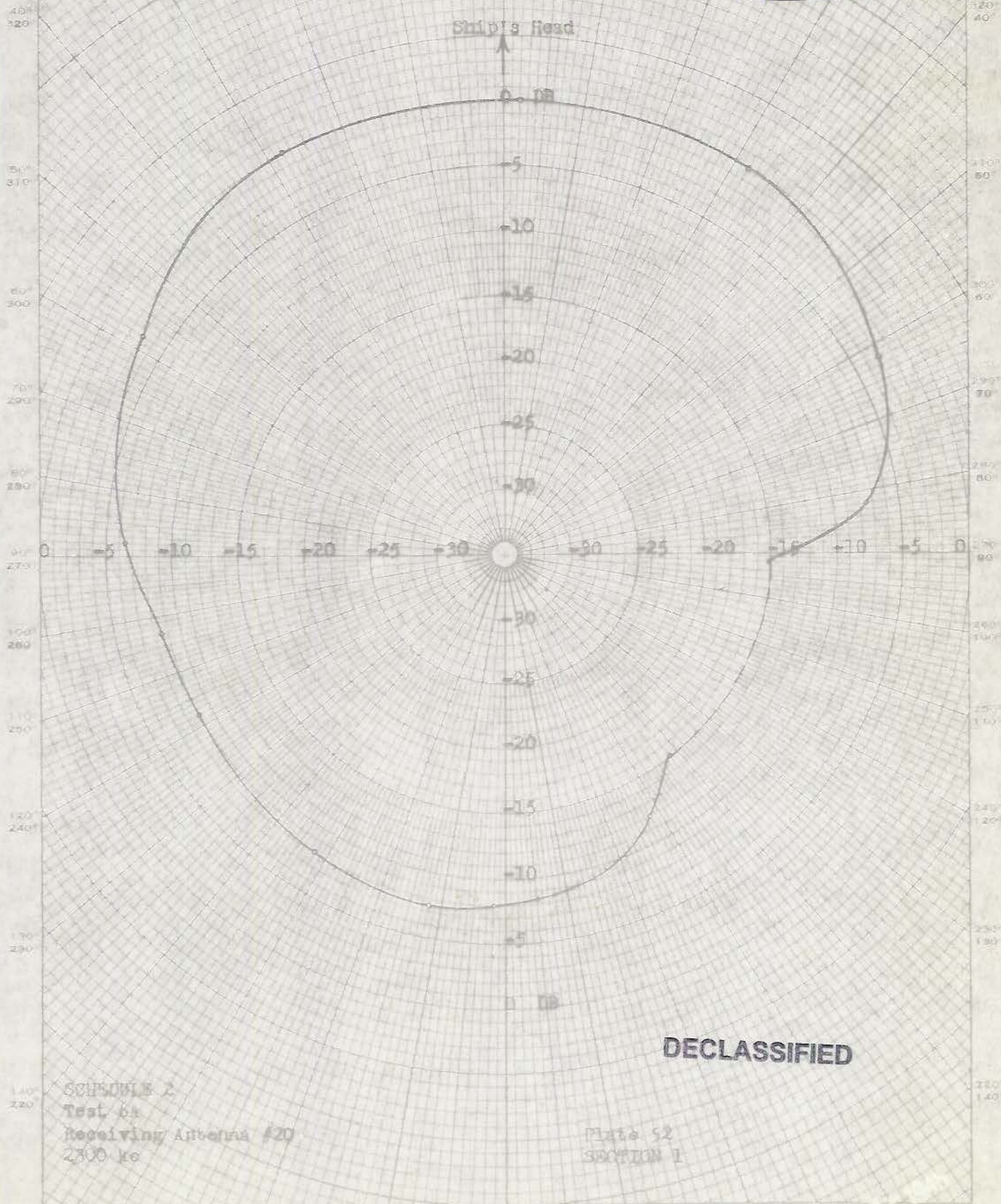
EUGENE DIETZSEN CO.
PART NO. 1
NO. 340-B DIETZSEN GRAPH PAPER
POLAR COORDINATE

Enclosure (R)
ANTENNA PATTERNS
USS TETON (AGC-14)

DECLASSIFIED



Ship's Head
↑



DECLASSIFIED

SHIPBOARD
Test 61
Receiving Antenna #20
2300 kc

Plate 52
SECTION I

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Enclosure (B)
ANTENNA PATTERNS
USS TETON (AGC-14)

Ship's Head

0 DB

-5

-10

-15

-20

-25

-30

-35

-40

-45

-50

-55

-60

-65

-70

-75

-80

-85

-90

0 DB

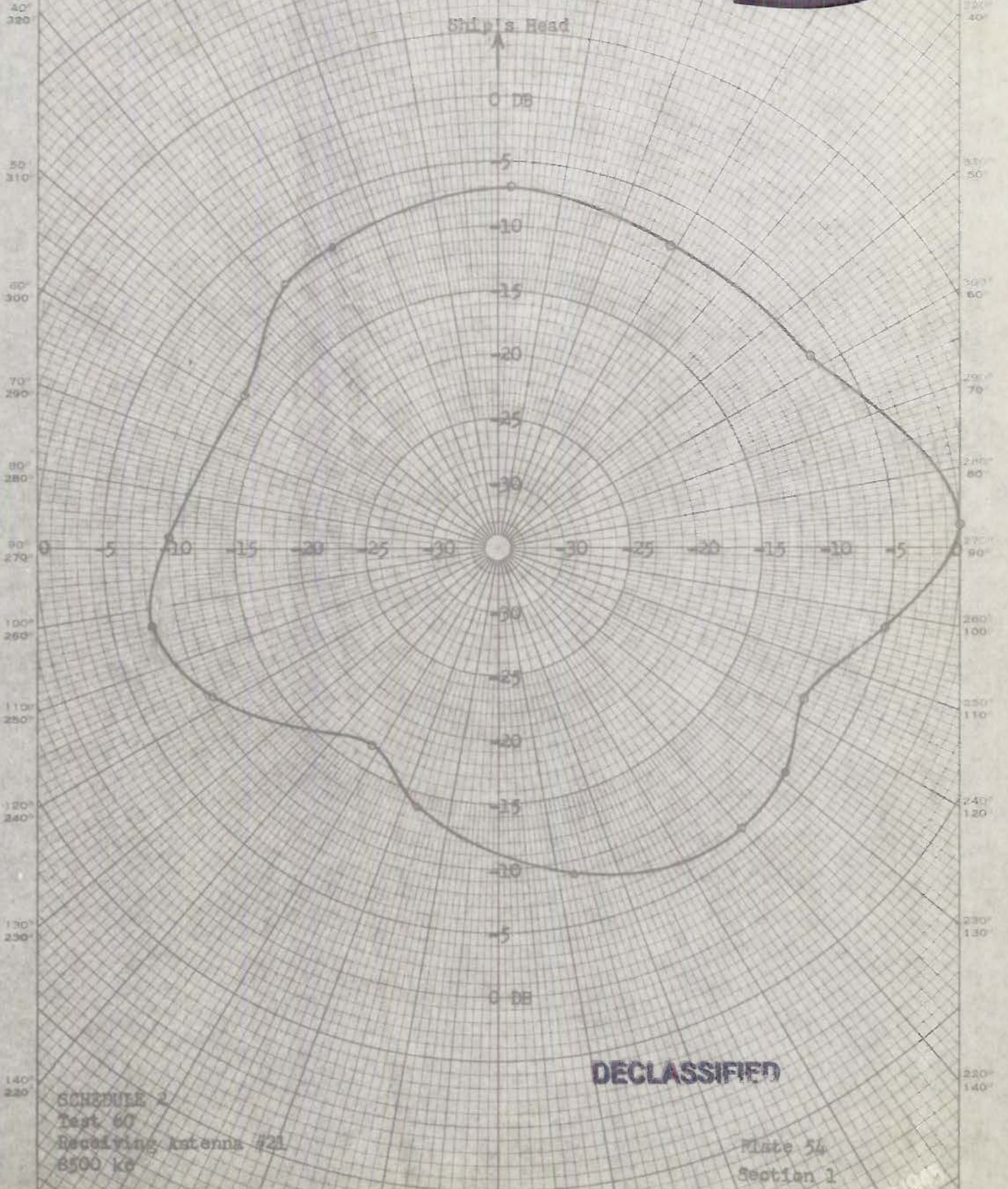
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SCHEDULE 2
Test 60
Receiving Antenna #21
8500 kc

Plate 54
Section 1

FEB 1945

POLAR COORDINATE



SECTION 2ANTENNA MEASUREMENTS OF SG EQUIPMENT
ON USS TETON (AGC-14)

Enclosures: Graphs (Plates 1 and 2)

2-1. Procedure

2-1-1. Antenna measurements were made on 5 November 1944 on the "Forward" SG and the "After" SG equipment installed on the USS TETON (AGC-14).

2-1-2. The coverage pattern of the SG antenna was measured from the shore while the TETON circled in the Bay at ranges from about 7000 to 8000 yards. The TETON's SG antenna was kept trained on the receiving antenna by means of a telescope. The telescope was kept trained at all times on the shore antenna with the telescope driving a 5G selsyn. The selsyn was connected to the SG at a place where the output of the ship's gyro is normally connected; thus the antenna followed the telescope at all times. A superheterodyne receiver which had been calibrated previously in this Laboratory, and whose output was displayed on an oscilloscope, was used to measure the received signal. The antenna for this receiver was located on a movable car on an inclined railway at a height above water intended to produce high signal strength from the SG aboard the TETON.

2-1-3. The enclosed graphs (Plates 1 and 2) give relative bearing versus signal strength in db. The signal strength is correct to within 2 db, and the bearings are correct to within a few degrees.

2-2. Discussion

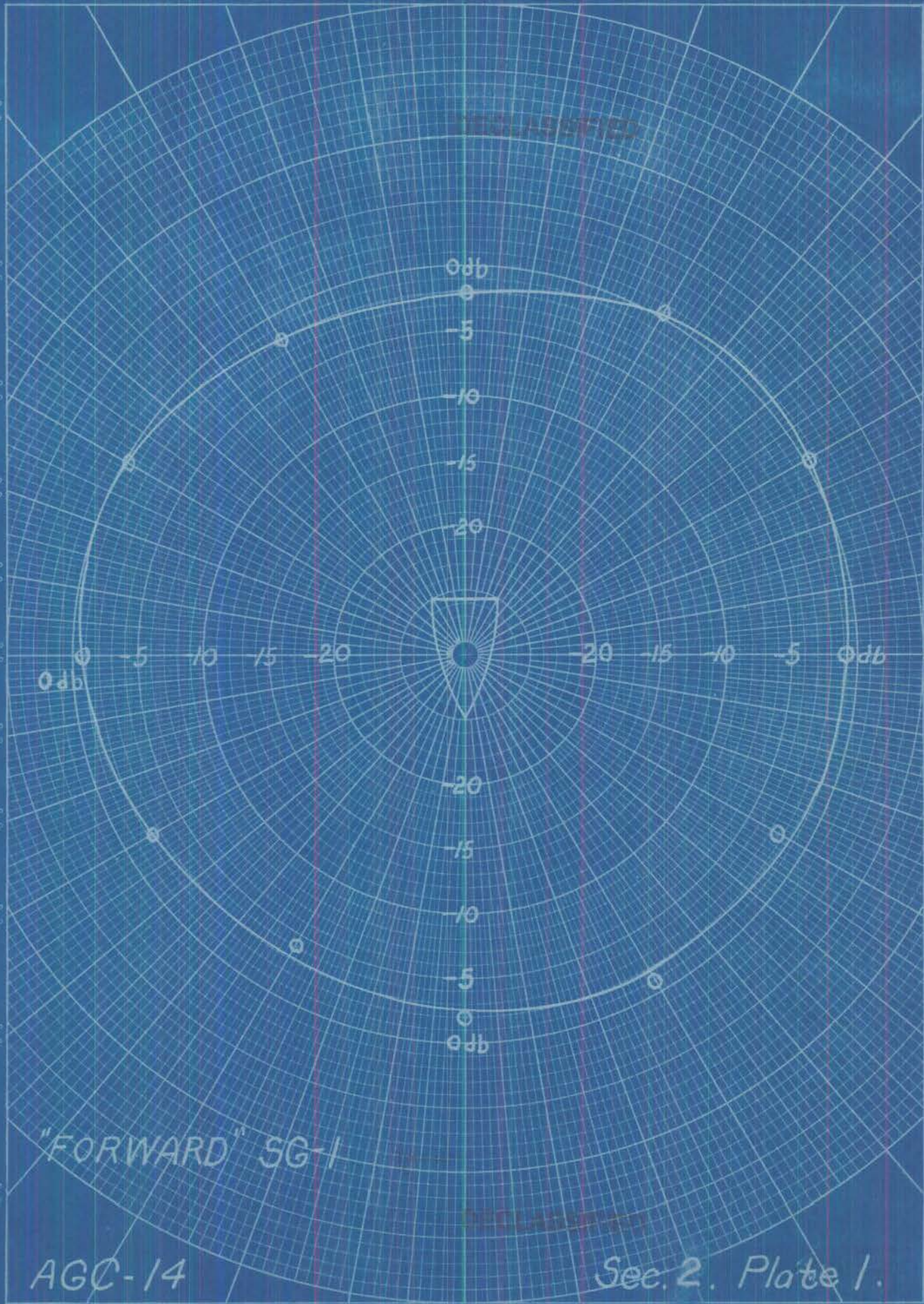
2-2-1. All of the db readings were adjusted for variations in range because of the technique used in making the measurements.

2-2-2. Plate 1 indicates adequate coverage from the "Forward" SG throughout the entire 360 degrees. The spread between maximum and minimum signal strength observed was slightly less than 5 db.

2-2-3. As illustrated in Plate 2, the "After" SG signal was strongest straight abeam, reducing continuously but slowly both fore and aft. This equipment was tested before the "Forward" SG was tested and the signal strength obtained was very low compared to that from the "Forward" SG. The reason for this was not discovered because there was no opportunity to repeat this test.

210° 150° 200° 160° 190° 170° 180° 170° 200° 160° 150° 210°

220° 140° 230° 130° 240° 120° 250° 110° 260° 100° 270° 90° 280° 80° 290° 70° 300° 60° 310° 50° 320° 40°



"FORWARD" SG-1

AGC-14

Sec. 2. Plate 1.

330° 30° 340° 20° 350° 10° 0 10° 350° 20° 340° 30° 330°

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