

EXHIBIT I

*M. Carter*

STATEMENT OF JOHN BARRON IN CONNECTION WITH

APPLICATION FOR CONSTRUCTION PERMIT

FOR STATION WCOA - PENSACOLA, FLORIDA

1340 KC - 1 KW - UNLIMITED HOURS

JOHN BARRON  
CONSULTING RADIO ENGINEER  
EARLE BUILDING  
WASHINGTON, D. C.

EXHIBIT I

STATEMENT OF JOHN BARRON IN CONNECTION WITH  
APPLICATION FOR CONSTRUCTION PERMIT  
FOR STATION WCOA - PENSACOLA, FLORIDA  
1340 KC - 1 KW - UNLIMITED HOURS

I am a consulting radio engineer with offices in the Earle Building, Washington, D. C., and have been engaged by the licensee of Station WCOA to design a directional antenna system and to prepare the following statement and accompanying data to be submitted with and made a part of the application for construction permit requesting authority to increase nighttime power to 1 kw and operate with directional antenna at night. The present assignment of this station is 1340 kc, 500 watts night, 1 kw daytime, using non-directional antenna and unlimited hours of operation. No change in the daytime operation is requested.

My education and experience are a matter of record on file with the Federal Communications Commission.

The present antenna of station WCOA is a vertical radiator 179 feet high which is shunt excited. The present ground system consists of 120 radials of copper wire buried approximately 8 inches deep, having a length up to 220 feet except where the ground wires enter the waters of Pensacola Bay where they are shorter. It is proposed to increase the height of the present tower and to insulate same. 21 feet will be added to the present tower so that it will be 200 feet above insulators. An additional tower will be installed northwest of the present tower, the spacing being  $325^{\circ}$  or 458 feet. The second tower will also be 200 feet above insulators. For nighttime operation the current in the northwest antenna will be 1.45 times the current in the southeast antenna. The current in the northwest antenna will lead the current in the southeast antenna by  $12.4^{\circ}$ . The ground system to be installed around the second antenna will consist of 120 radials of No. 10 bare copper wire which will be buried in the salt water of Pensacola Bay, length 180'.

For daytime operation the system will be operated in the non-directional manner the same as at present by supplying the current to one tower and detuning the other tower. A sketch of the proposed antenna and ground system arrangement is attached hereto.

The mathematical computations of the directional antenna patterns are also attached as well as the horizontal and vertical plane radiation patterns.



Statement of John Barron For Station WCOA - 2

It is proposed to retain the present transmitter site of Station WCOA inasmuch as this site is entirely satisfactory for the operation herein proposed. A map is attached showing the relation of this site to airports and airways. Maps are attached showing the comparison between the present and proposed service areas at night as well as the present daytime service area. The following contours are shown: 250, 25, 5, 4, 2 and 0.5 mv/m. At the present time WCOA is limited to 1.6 mv/m at night. As proposed, the station will be limited to the normal contour 2.5 mv/m at night. The 0.5 mv/m contour represents the extent of the primary daytime service area.

Operation of WCOA as proposed will impose the following limitations on existing stations now operating on 1340 kc at night with the exception of K D T H, Dubuque, Iowa, the limitation of which is shown in spite of the fact that K D T H now operates only during daytime hours. This is shown in order to prove that the operation of WCOA as proposed will not prevent nighttime operation by Station K D T H. As all of these stations are interfered with below 1.75 mv/m, it is obvious that the operation of WCOA as proposed will not cause objectionable interference to any existing stations on 1340 kc. This analysis is based upon the FCC curve for the second hour after sunset, values exceeded 10% of the time and the assumption that this curve represents the radiation from an 0.311 wavelength antenna:

K D T H	$\frac{139}{98.5}$	x	0.061	x	20	=	1.44
K G N O	$\frac{137}{99}$	x	0.0455	x	20	=	1.26
K F R O	$\frac{58}{94}$	x	0.136	x	20	=	1.68
W S F D	$\frac{58.5}{98}$	x	0.089	x	20	=	0.705

(signed) John Barron



Statement of John Barron For WCOA - 3

City of Washington )  
: ss:  
District of Columbia)

I, John Barron, being first duly sworn, upon oath depose and say that the facts stated in the foregoing report by me subscribed are true of my own personal knowledge except those stated upon information and belief, and those facts I verily believe to be true.

(signed) John Barron

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Subscribed and sworn to before me this 15th day of July, 1940.

My commission expires 11/15/42.

(signed) Mildred G. Murnan

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Notary Public, Washington, D. C.



HORIZONTAL PLANE RADIATION PATTERN  
STATION WCOA - PENSACOLA, FLORIDA  
PROPOSED OPERATION  
1340 KC - 1 KW - DA-N  
JOHN BARRON  
RADIO ENGINEER  
WASHINGTON, D.C.

7/5/50

NOTE

115

115

115

LINE OF

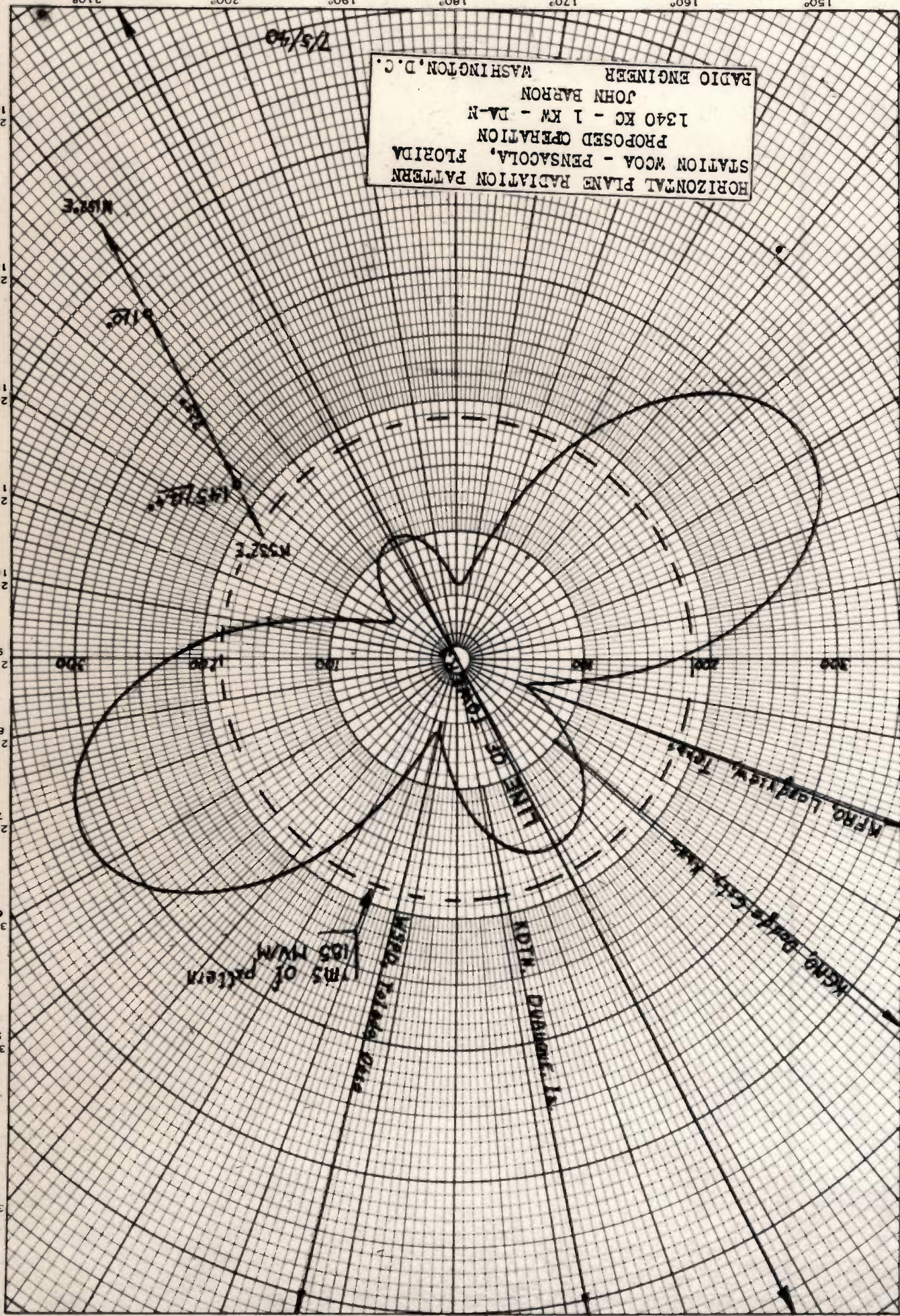
KFRO, LANTANA, FLA.

KGND, BAYVIEW, FLA.

KTTH, DUNN, FLA.

WSPR, PALM BEACH, FLA.

115 of pattern  
105 W/M





140°  
220°

130°  
230°

120°  
240°

110°  
250°

100°  
260°

90°  
270°

80°  
280°

70°  
290°

60°  
300°

50°  
310°

40°  
320°

N 152° E

Back Line of Towers

N 332° E

Front Line of Towers

150°

160°

170°

180°

190°

200°

210°

30°

20°

10°

0°

350°

340°

330°

G-180°

G-0°

M/M

100

75

50

25

25

100

150

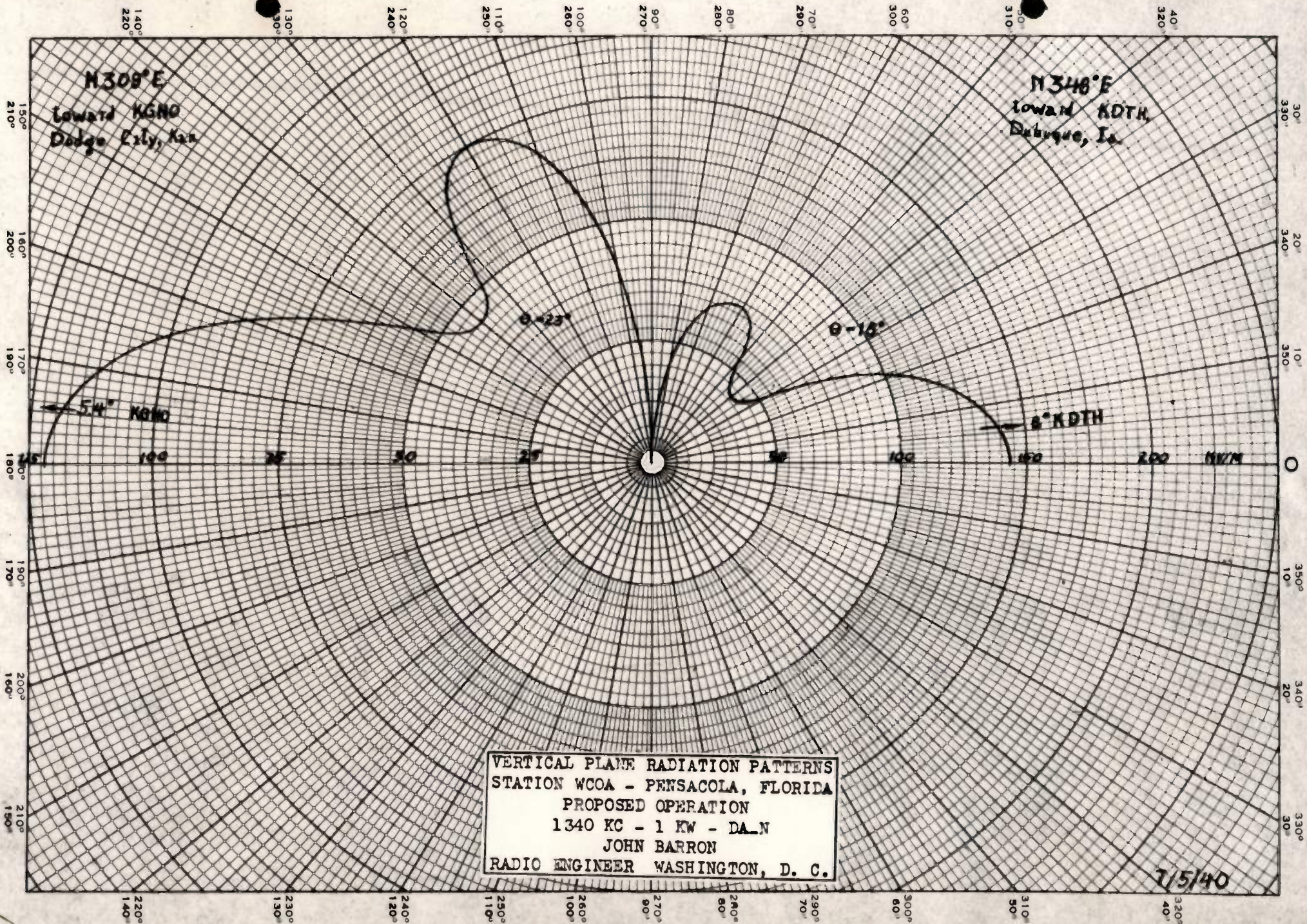
200

M/M

VERTICAL PLANE RADIATION PATTERNS  
STATION WCOA - PENSACOLA, FLORIDA  
PROPOSED OPERATION  
1340 KC - 1 KW - DA-N  
JOHN BARRON  
RADIO ENGINEER WASHINGTON, D. C.

715140







140°  
220°

130°  
230°

120°  
240°

110°  
250°

100°  
260°

90°  
270°

80°  
280°

70°  
290°

60°  
300°

50°  
310°

40°  
320°

N 13.5° E & N 290.5° E  
toward WSPD  
Toledo, Ohio  
And KFRD  
Longview, Tex.

$\theta = 41.5^\circ$

KFRD 14.8°

WSPD 6.8°

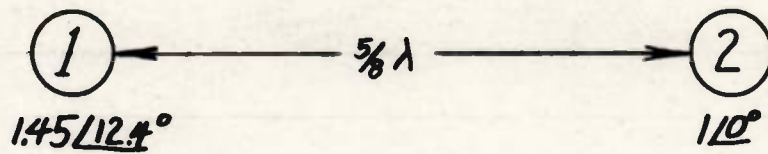
100 MV/M

VERTICAL PLANE RADIATION PATTERNS  
STATION WCOA - PENSACOLA, FLORIDA  
PROPOSED OPERATION  
1340 KC - 1 KW - DA-N  
JOHN BARRON  
RADIO ENGINEER WASHINGTON, D. C.

7/5/40

WCOA FIG 4





$$R_{11} = R_{22} = 36.6$$

$$Z_{12} = 13.8 \angle -160^\circ$$

$$\begin{aligned} R_1 &= 36.6 + \frac{13.8}{1.45} \cos(-160 - 12.4) \\ &= 36.6 - 9.43 = 27.17 \end{aligned}$$

$$\begin{aligned} R_2 &= 36.6 + 1.45 \times 13.8 \cos(-160 + 12.4) \\ &= 36.6 - 16.89 = 19.71 \end{aligned}$$

$$"g_{012}" = \sqrt{\frac{36.6}{19.71 + 1.45^2 \times 27.17}} = 0.691$$

$$\begin{aligned} E &= 190 \times 0.691 f(\phi) \sqrt{3.102 + 2.9 \cos(225^\circ \cos \theta \cos \phi + 12.4^\circ)} \\ &= 131.4 f(\phi) \sqrt{3.102 + 2.9 \cos(225^\circ \cos \theta \cos \phi + 12.4^\circ)} \end{aligned}$$



# Horizontal Plane Radiation Pattern

$$\phi = 0^\circ$$

$$E = 131.4 \sqrt{3.102 + 2.9 \cos(225^\circ \cos \theta + 12.4^\circ)}$$

A	B	C	D	E	F
$\theta$	$225^\circ \cos \theta$	$B + 12.4^\circ$	$2.9 \cos C$	$3.102 + D$	$131.4 \sqrt{E}$
0	225.0°	237.4°	-1.562	1.540	163.0
10	221.8	234.2	-1.697	1.405	156.0
20	211.5	223.9	-2.090	1.012	132.2
30	194.9	207.3	-2.578	0.524	95.2
40	172.3	186.7	-2.880	0.222	61.9
50	144.7	157.1	-2.675	0.427	85.9
60	112.5	124.9	-1.655	1.447	158.2
70	77.0	89.4	0.030	3.132	232.5
80	39.1	51.5	1.805	4.907	291.5
90	0.0	12.4	2.835	5.937	320.5
100	-39.1	-26.7	2.595	5.697	314.0
110	-77.0	-64.6	1.243	4.345	274.5
120	-112.5	-100.1	-0.504	2.598	212.0
130	-144.7	-132.3	-1.950	1.152	152.0
140	-172.3	-159.9	-2.725	0.377	80.8
150	-194.9	-182.5	-2.898	0.204	59.3
160	-211.5	-199.1	-2.740	0.362	79.1
170	-221.8	-209.4	-2.525	0.577	99.9
180	-225.0	-212.6	-2.445	0.657	106.4



# Vertical Pattern, Front Line of Towers

$$\theta = 0^\circ$$

$$E = 131.4 f(\phi) \sqrt{3.102 + 2.9 \cos(225^\circ \phi + 12.4^\circ)} = f(\phi) \times HP$$

A	B
$\phi$	$f(\phi) \times HP$
0	163.0
10	152.7
20	120.8
30	77.7
40	43.0
50	48.0
60	66.1
70	64.3
80	39.9
90	0.0

# Vertical Pattern, Back Line of Towers

$$\theta = 180^\circ$$

$$E = 131.4 f(\phi) \sqrt{3.102 + 2.9 \cos(-225^\circ \phi + 12.4^\circ)} = f(\phi) \times HP$$

A	B
$\phi$	$f(\phi) \times HP$
0	106.4
10	97.7
20	72.3
30	48.5
40	56.1
50	85.0
60	88.5
70	76.0
80	43.0
90	0.0



Vertical Pattern toward KOTH, Dubuque, Ia

$\theta = 16^\circ$

$$E = 131.4 + f(\phi) \sqrt{3.102 + 2.9 \cos(216.2^\circ \cos \phi + 12.4^\circ)}$$

A	B	C	D	E	F
$\phi$	$216.2^\circ \phi$	$B + 12.4^\circ$	$2.9 \cos C$	$D + 3.102$	$131.4 + f(\phi) \sqrt{E}$
0	216.2	228.6	-1.918	1.184	143.2
10	213.0	225.4	-2.035	1.067	132.8
20	203.5	215.9	-2.350	0.752	104.3
30	187.3	199.7	-2.733	0.269	55.7
40	165.8	178.2	-2.899	0.203	41.2
50	139.0	151.4	-2.548	0.554	54.7
60	108.1	120.5	-1.472	1.730	72.3
70	74.0	86.4	0.283	3.385	66.9
80	37.6	50.0	1.863	4.965	40.1
90	0.0	12.4	2.835	5.937	0.0

Vertical Pattern toward KGNQ, Dodge City, Kans

$\theta = 23^\circ$

$$E = 131.4 + f(\phi) \sqrt{3.102 + 2.9 \cos(207^\circ \cos \phi + 12.4^\circ)}$$

A	B	C	D	E	F
$\phi$	$207^\circ \phi$	$B + 12.4^\circ$	$2.9 \cos C$	$D + 3.102$	$131.4 + f(\phi) \sqrt{E}$
0	207.4	219.4	-2.240	0.862	122.1
10	204.0	216.4	-2.335	0.767	112.4
20	194.7	207.1	-2.580	0.522	86.9
30	179.3	191.7	-2.840	0.262	55.0
40	158.7	171.1	-2.860	0.242	45.0
50	133.1	146.5	-2.418	0.684	60.8
60	103.5	115.9	-1.267	1.835	74.4
70	70.9	83.3	0.338	3.440	67.6
80	36.0	48.4	1.925	5.027	40.4
90	0.0	12.4	2.835	5.937	0.0

WCOA

1 KW

Math 4



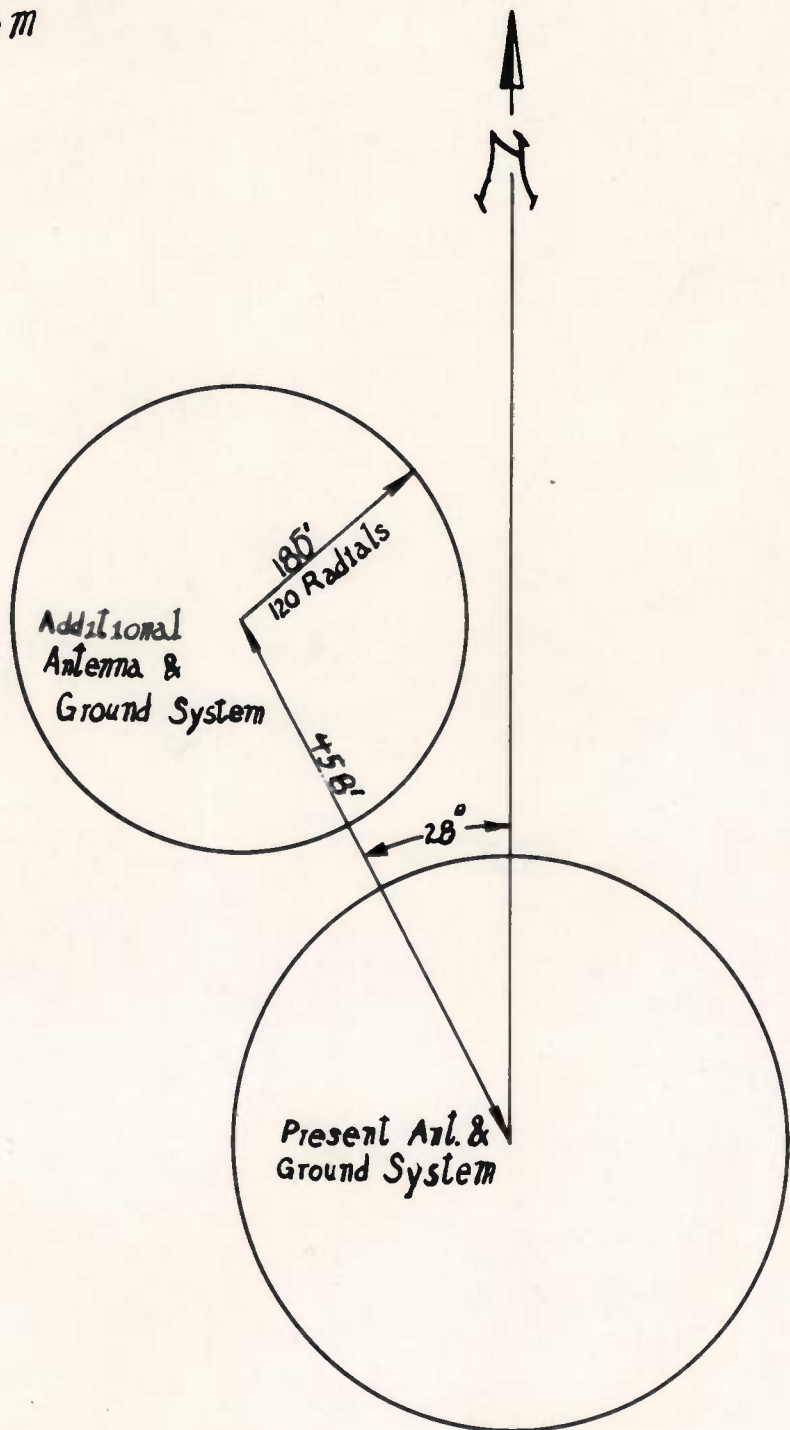
Vertical Pattern toward WSPD, Toledo, Ohio  
 $\theta = 41.5^\circ$  and KFRQ, Longview, Tex.  
 $E = 131.4 f(\phi) \sqrt{3.102 + 2.9 \cos(168.6^\circ \cos \phi + 12.4^\circ)}$

A	B	C	D	E	F
$\phi$	$168.6 \cos \phi$	$B + 12.4^\circ$	$2.9 \cos C$	$3.102 + D$	$131.4 f(\phi) \sqrt{E}$
0	168.6	181.0	-2.900	0.202	59.0
10	166.1	178.5	-2.900	0.202	57.8
20	158.3	170.7	-2.862	0.240	58.9
30	146.0	158.4	-2.700	0.402	68.1
40	129.1	141.5	-2.268	0.834	83.5
50	108.3	120.7	-1.480	1.622	93.6
60	84.3	96.7	-0.338	2.764	91.4
70	57.7	70.1	0.987	4.089	73.6
80	29.3	41.7	2.165	5.267	41.3
90	0.0	12.4	2.835	5.937	0.0



WCOA

Pensacola, Fla.  
Additional Antenna  
& Ground System



John Barron  
Radio Engineer

Washington D.C.  
7/9/40





RELATION OF STATION WCOA TO  
PENSACOLA AIRPORTS  
JOHN BARRON  
RADIO ENGINEER WASHINGTON, D.C.

ALABAMA  
FLORIDA

M E X I C O

40 30 20 10 0 10  
STATUTE MILES

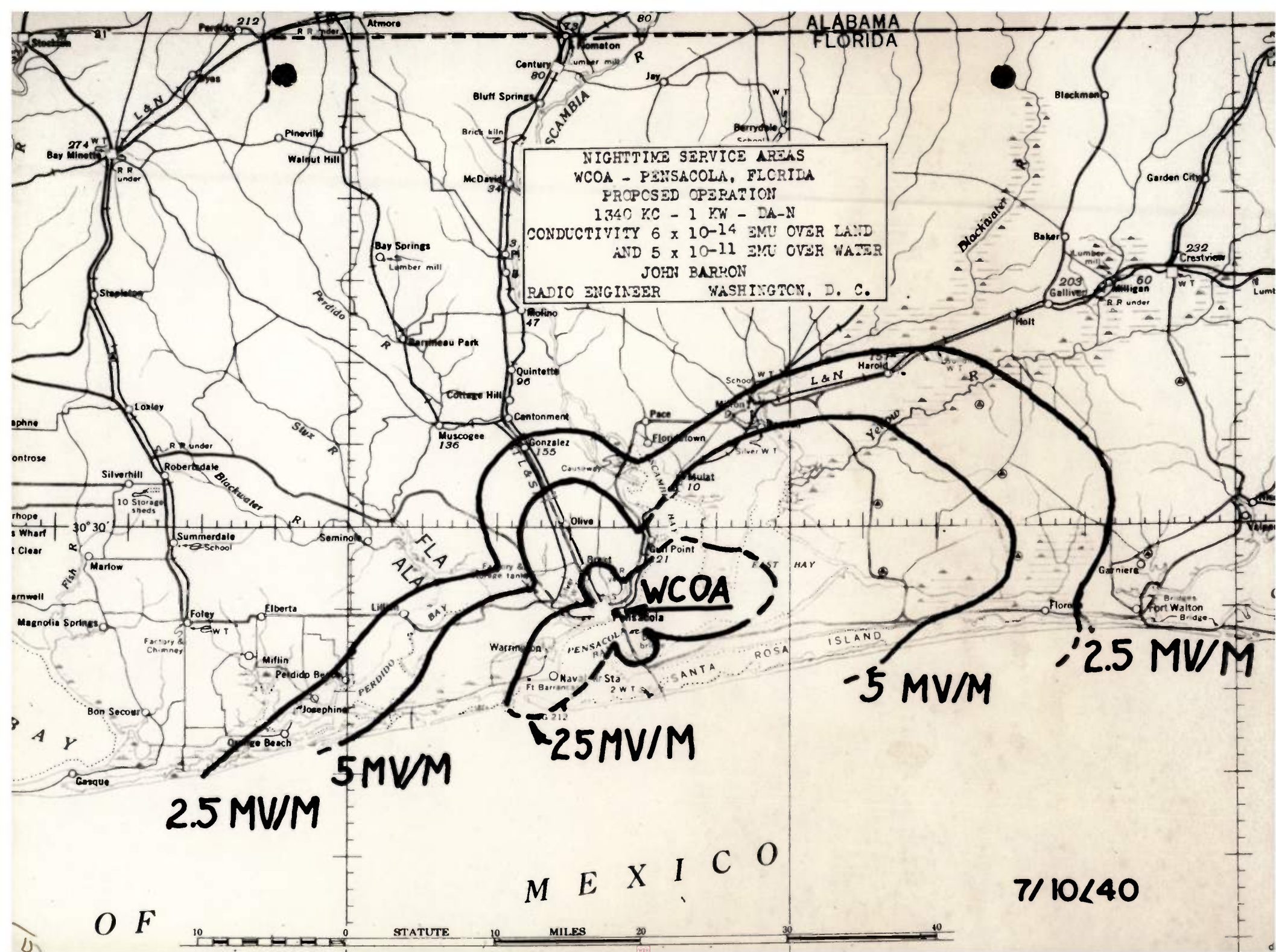
N S

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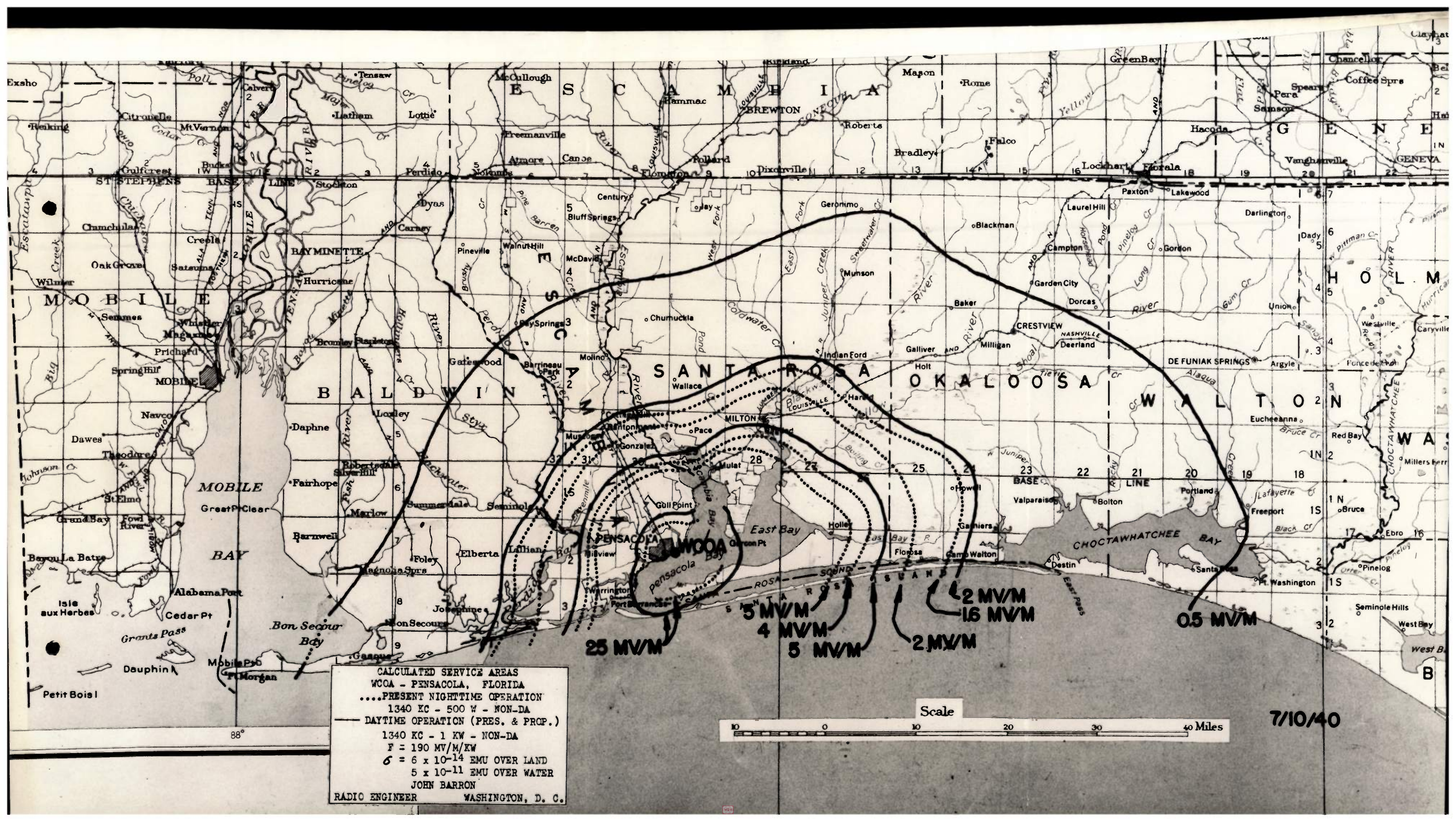
WRN

14





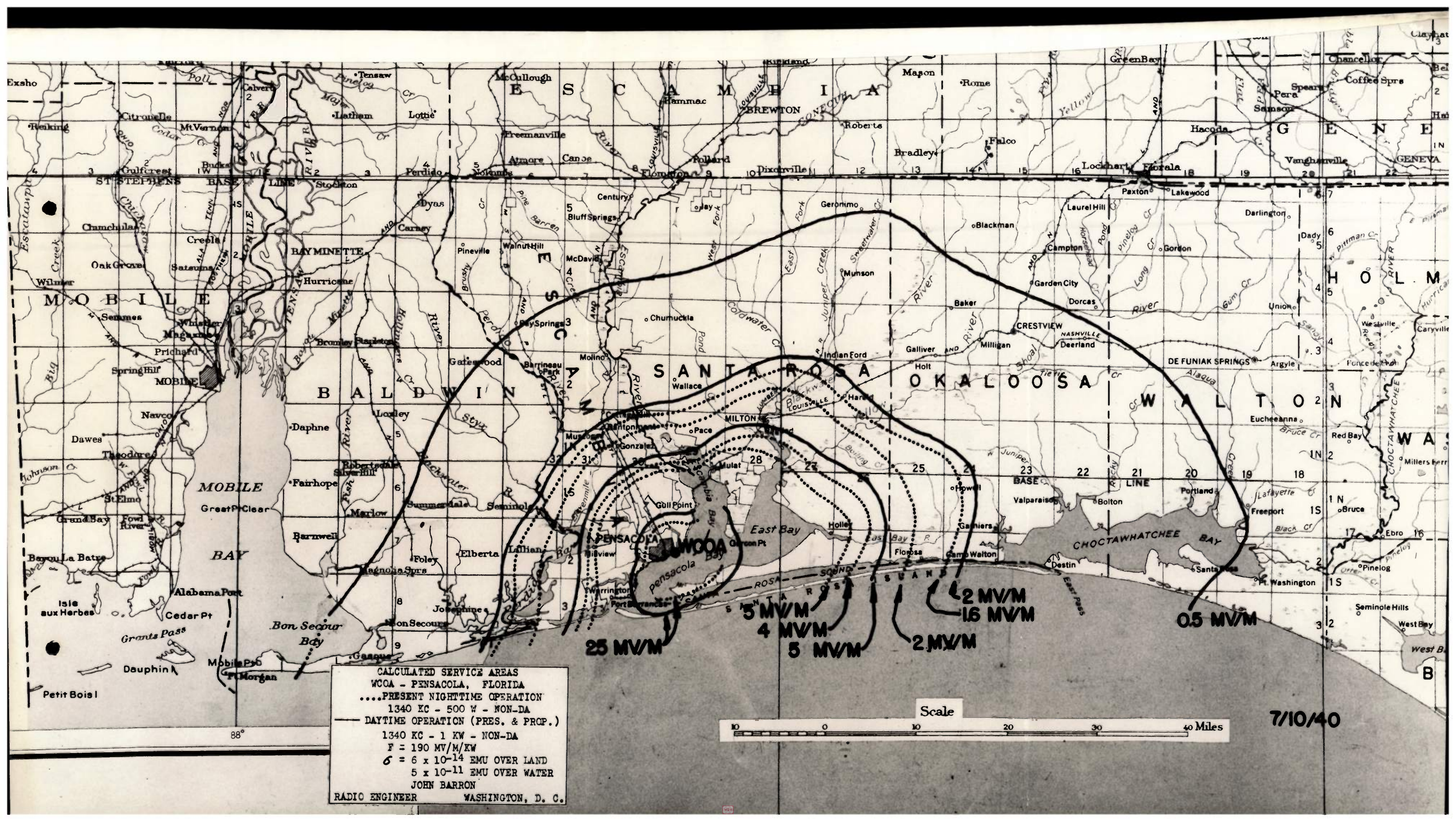




CALCULATED SERVICE AREAS  
WCOA - PENSACOLA, FLORIDA  
....PRESENT NIGHTTIME OPERATION  
1340 KC - 500 W - NON-DA  
— DAYTIME OPERATION (PRES. & PROP.)  
1340 KC - 1 KW - NON-DA  
F = 190 MV/M/KW  
 $\sigma$  =  $6 \times 10^{-14}$  EMU OVER LAND  
       $5 \times 10^{-11}$  EMU OVER WATER  
JOHN BARRON  
RADIO ENGINEER      WASHINGTON, D. C.

7/10/40





CALCULATED SERVICE AREAS  
WCOA - PENSACOLA, FLORIDA  
....PRESENT NIGHTTIME OPERATION  
1340 KC - 500 W - NON-DA  
— DAYTIME OPERATION (PRES. & PROP.)  
1340 KC - 1 KW - NON-DA  
F = 190 MV/M/KW  
σ = 6 x 10<sup>-14</sup> EMU OVER LAND  
5 x 10<sup>-11</sup> EMU OVER WATER  
JOHN BARRON  
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7/10/40