

File No.

Call letters **KWFT**.....

UNITED STATES OF AMERICA
FEDERAL COMMUNICATIONS COMMISSION

APPLICATION FOR REGULAR BROADCAST STATION LICENSE

(Submit in duplicate to Federal Communications Commission, Washington, D. C. Swear to one copy)

To the Federal Communications Commission:

1. Name of applicant* **WICHITA BROADCASTING COMPANY**.....
2. Post-office address: State **TEXAS**..... City **WICHITA FALLS**.....
Street and number **800 EIGHTH STREET**.....
3. Construction permit under which construction has been made:
File No. **B3-P-2461**..... Date **JULY 5,**....., 19**40**.....
4. Construction of station was commenced **AUGUST 1, 1940**..... and
was completed **OCTOBER 29, 1940**....., and is now in satisfactory operating
condition and ready for regular operation.
5. Description of transmitting apparatus which has been constructed pursuant to said construction permit:
 - (a) Make **RCA MFG. COMPANY**..... Type No. **5-DX**..... Serial No. **BC-1780**.....
 - (b) Oscillator: Type of circuit **PIEZO ELECTRIC**..... Number, manufacturer's name, and
type of tubes **ONE RCA 802**.....
Actual plate current per tube **22 MA.**..... Plate voltage **350 VOLTS**.....
 - (c) Last radio stage: Number, manufacturer's name, and type of tubes.....
ONE RCA 892-R.....
Actual night operation: Plate current per tube **0.365 AMP.** Plate voltage **3700 VOLTS** If greater
day power than night power is authorized, specify the following: Actual day operation: Plate
current per tube **0.810 AMP.** Plate voltage **8300 VOLTS** Describe fully the method and
procedure of reducing power at sunset **REDUCE PLATE VOLTAGE TO MODULATED**
AMPLIFIER AND ADJUST LOADING FOR PROPER EFFICIENCY.....

* Name must be identical with that used in construction permit.

(d) Modulator or last audio stage: Number, manufacturer's name, and type of tubes

Two RCA 891-R

Actual plate current per tube 0.05-0.50 AMP. Plate voltage 3300 VOLTS

(e) What maximum percentage of modulation was obtained on equipment tests under authorized operating conditions? 100%

(f) State name and type number of modulation monitor

RCA MODULATION MONITOR TYPE 66-A

(g) Give Federal Communications Commission approval number 1552

(h) Specify manufacturer's name, type number, and full scale reading of the following meters:

(1) In last radio stage:

Plate voltmeter WESTON TYPE 741 0-12 KV Serial No. 1156

Plate ammeter WESTON TYPE 741 0-1.5 AMP. Serial No. 1141

(2) Antenna ammeter SEE ATTACHED LIST Serial No.

(i) Antenna current for authorized operation:

Night SEE ATTACHED peres.

**SEE ATTACHED LIST OF
METERS AND READINGS**

Day SEE ATTACHED amperes.

(j) Maximum operating carrier power output of transmitter for satisfactory operation is 5000 watts.

(k) Maximum rated carrier power of transmitter as determined by orders of the Commission is 5000 watts.

(l) Description of frequency monitor.

(1) Manufacturer's name GENERAL RADIO Co. Type No. 475B/681A

(2) Serial No. 244/258 F. C. C. Approval No. 1452

(3) Date of original installation JULY 10, 1939

(4) Date of last reinstatement into service IN CONTINUOUS SERVICE

(5) Give the following data on the calibration of the monitor during the testing of the above equipment:

Date	Time	Name of external checking agency	Frequency measured by external agency	Monitor reading, high or low
10/24/40	4:30 AM C.S.T.	COMMERCIAL RADIO EQUIPMENT COMPANY KANSAS CITY, MO.	620,000	ZERO

(m) By what method and how often will regular checks of the calibration of the frequency monitor be repeated INDEPENDENT FREQUENCY CHECK BY COMMERCIAL FREQUENCY CHECKING SERVICE - AT LEAST ONCE MONTHLY.

(n) Were all operating values specified above obtained and maintained on equipment tests? YES

If not, give full details EXCEPT DURING CALIBRATION AND ADJUSTMENT OF EQUIPMENT.

6. If application is for license for special broadcast station (on frequencies of 1530, 1550, or 1570 kc),

- (a) Attach complete final calculations on operating power, giving antenna input power, antenna resistance measurements, plate input power, efficiency, and other pertinent test data on the determination of the power.
- (b) Attach data and graphs taken on the modulating characteristics and capability of transmitter with complete description of method and apparatus employed. These data are required on each transmitter after installation and with operating constants as given in section 5 (b), (c), and (d).
- (c) Attach data and graphs taken on overall frequency transmitting characteristics of entire station with complete description of method and apparatus employed. These data are required on each transmitter after installation and with operating constants as given in section 5 (b), (c), and (d).
- (d) Attach sketch and dimensions of antenna system.
- (e) Attach any other pertinent test data on the operation of the station showing its condition of operation, such as radio frequency harmonics, effective field intensity, etc.

7. In what respect, if any, does the apparatus constructed differ from that described in the application for construction permit or in the permit? NO CHANGES

8. Location of transmitter: State TEXAS County WICHITA COUNTY
APPROXIMATELY 2.5 MI. WNW AT
City or town WICHITA FALLS Street and number RESETTLEMENT ROAD
N. Latitude: Degrees 33 Minutes 55 Seconds 07.42
W. Longitude: Degrees 98 Minutes 32 Seconds 37.21

9. Location of studio: State TEXAS County WICHITA
City or town WICHITA FALLS Street and number 800 EIGHTH STREET

10. The frequency, power, hours of operation, and call letters authorized, are as follows:

(a) Frequency 620,000 kilocycles.

(b) Power: (1) Night 1000 WATTS DA

(2) Day 5000 WATTS DA

(c) Hours of operation UNLIMITED

(d) Call letters KWFT

11. Applicant represents that all the terms, conditions, and obligations set forth in the above-described construction permit have been fully met, except as follows: NO EXCEPTIONS

12. Applicant reaffirms the truth, as of the date of this application, of all statements made in the application for construction permit pursuant to which said construction permit was granted.
13. Applicant waives any claim to the use of any particular frequency or of the ether as against the regulatory power of the United States because of the previous use of the same, whether by license or otherwise. and requests a station license in accordance with this application.

Dated this 29TH day of OCTOBER, 19 40

WICHITA BROADCASTING COMPANY
(Must correspond with item 1) *Applicant.*

By

Official.

(BE SURE ALL NECESSARY INFORMATION IS FURNISHED)

STATE OF TEXAS }
COUNTY OF DALLAS } ss:

JOE B. CARRIGAN, being first duly sworn upon his oath, affirmed according to law, deposes and says that he is the PRESIDENT OF THE WICHITA BROADCASTING COMPANY
(If applicant is not an individual, state relation of affiant to applicant)
above-named applicant, and that the facts stated in the foregoing application and all exhibits attached thereto are true of his own knowledge, except as to such statements as are therein stated on information and belief, and as to such statements he believes them to be true.

Subscribed and sworn to before me this 29TH day of OCTOBER, 19 40

[SEAL]

(Notary Public's seal must be affixed where law of jurisdiction requires, otherwise state that law does not require seal.)

Notary Public.

My commission expires _____

† Must be subscribed and verified by party applicant, by one of the parties if more than one, by an officer if applicant is a corporation, or by attorney of applicant only under the provisions of rule 105.34 which must be fully explained.

SUPPLEMENT TO F.C.C. 302 FORM

QUESTIONS 5(H) AND 5(1)

CURRENTS FOR AUTHORIZED OPERATION:

<u>LOCATION</u>	<u>DESCRIPTION</u>	<u>MAKE</u>	<u>MODEL</u>	<u>RANGE</u>	<u>SERIAL</u>	<u>READINGS</u>	
						<u>1000 WATTS</u>	<u>5000 WATTS</u>
PLANT BLDG.	PLATE CURRENT	WESTON	741	0-1.5 AMP.	1141	0.365	0.810
PLANT BLDG.	PLATE VOLTS	WESTON	741	0-12 KV	1156	3700	8300
NORTH TOWER	NORTH TOWER CURRENT	WESTON	743 ES	0-8 AMP.	433	2.60	5.80
SOUTH TOWER	SOUTH TOWER CURRENT	WESTON	269	0-15 AMP.	34448	-	10.35
SOUTH TOWER	SOUTH TOWER CURRENT	WESTON	425	0-8 AMP.	206887	4.58	-
PLANT BLDG.	NORTH LOOP CURRENT	WESTON	743 ES	0-8 AMP.	318	3.02	6.60
PLANT BLDG.	SOUTH LOOP CURRENT	WESTON	743 ES	0-15 AMP.	409	4.80	10.50
PLANT BLDG.	COMMON POINT CURRENT	WESTON	743 ES	0-6 AMP.	434	1.92	4.30
PLANT BLDG.	PHASE MONITOR	R.C.A.	300-A	0-360°	542	42°	42°

*NORTH TOWER LEADS SOUTH TOWER 38° - MONITOR INDICATION 42°

STATEMENT OF A. EARL CULLUM, JR. IN CONNECTION WITH THE APPLICATION OF RADIO STATION KWFT, WICHITA FALLS, TEXAS, FOR REGULAR BROADCAST STATION LICENSE FOR OPERATION ON 620 KILOCYCLES, 5000 WATTS DAYTIME, 1000 WATTS NIGHTTIME, USING A DIRECTIONAL ANTENNA BOTH DAY AND NIGHT.

I, A. EARL CULLUM, JR., AM A CONSULTING RADIO ENGINEER WITH OFFICES LOCATED IN DALLAS, TEXAS. I HAVE BEEN EMPLOYED BY THE WICHITA BROADCASTING COMPANY, LICENSEE OF RADIO STATION KWFT, TO ADJUST AND MAKE MEASUREMENTS ON THE DIRECTIONAL ANTENNA INSTALLED BY KWFT, AND TO MAKE A STUDY OF THE PERFORMANCE THEREOF.

THE CONSTRUCTION OF THE KWFT DIRECTIONAL ANTENNA WAS COMPLETED UNDER THE DIRECTION OF MR. JOE B. CARRIGAN, PRESIDENT OF THE WICHITA BROADCASTING COMPANY. A COMPLETE DESCRIPTION OF THE ANTENNA SYSTEM IS AS FOLLOWS:

- A. TWO ELEMENTS ARE USED.
- B. EACH ELEMENT IS A SERIES FED, SELF-SUPPORTING, SQUARE, TAPERED, STEEL TOWER MANUFACTURED BY THE LEHIGH STRUCTURAL STEEL COMPANY.
- C. NONE OF THE ELEMENTS IS TOP-LOADED.
- D. HEIGHT OF EACH ELEMENT IS 400 FEET ABOVE THE BASE INSULATORS.
- E. HEIGHT OF EACH ELEMENT IS 405 FEET ABOVE THE GROUND LEVEL.
- F. HEIGHT OF EACH ELEMENT IS 1405 FEET ABOVE THE MEAN SEA LEVEL.
- G. THE ELEMENTS ARE SPACED 1308 FEET OR APPROXIMATELY 317 ELECTRICAL DEGREES ON A LINE NORTH 155.5 DEGREES EAST. THE PHASE RATIOS AND THE CURRENT RATIOS ARE AS FOLLOWS:

	<u>CURRENT RATIO</u>	<u>PHASE RATIO</u>
NORTH	0.63	PLUS 38°
SOUTH	1.00	000

- H. ABOUT EACH ELEMENT A RADIAL GROUND SYSTEM HAS BEEN INSTALLED CONSISTING OF 120 RADIALS, EACH RADIAL 400 FEET LONG, AND 120 RADIALS, EACH 60 FEET LONG, EQUALLY SPACED ABOUT EACH TOWER. THE GROUND RADIALS ARE BURIED 6 TO 8 INCHES.
- I. THE RESISTANCE AT THE COMMON POINT OF INPUT IS 292 OHMS. NINETY-TWO AND FIVE TENTHS PER CENT OF 292 OHMS IS 270 OHMS. THE CURRENT AT THE COMMON POINT OF INPUT IS 1.92 AMPERES FOR 1000 WATTS AND 4.30 AMPERES FOR 5000 WATTS. ATTACHED WILL BE FOUND A TABULATION OF ALL METER READINGS.
- J. A SCHEMATIC SKETCH OF THE DIRECTIONAL ANTENNA SYSTEM IS ATTACHED HERETO.
- K. METHOD OF FEEDING THE ELEMENTS IS COMPLETELY DISCLOSED IN THE SCHEMATIC SKETCH OF SECTION J.
- L. THE ELEMENTS HAVE BEEN PAINTED AND LIGHTED IN EXACT ACCORD WITH THE SPECIFICATIONS ATTACHED TO THE CONSTRUCTION PERMIT. THESE SPECIFICATIONS ARE AS FOLLOWS:
- "EACH TOWER SHALL BE PAINTED THROUGHOUT ITS HEIGHT WITH ALTERNATE BANDS OF INTERNATIONAL ORANGE (ORANGE YELLOW No. 5 OF COLOR CARD SUPPLEMENT TO THE UNITED STATES ARMY QUARTERMASTER CORPS SPECIFICATIONS No. 3-1) AND WHITE, TERMINATING WITH INTERNATIONAL ORANGE BANDS AT BOTH TOP AND BOTTOM. THE WIDTH OF THE INTERNATIONAL ORANGE BANDS SHALL BE FROM 30 TO 40 FEET. THE WHITE BANDS SHALL BE ONE-HALF THE WIDTH OF THE INTERNATIONAL ORANGE BANDS.

L. CONTD.

"FOR NIGHT MARKING THERE SHALL BE INSTALLED AT THE TOP OF EACH TOWER A FLASHING RED HAZARD BEACON SIMILAR TO A 300 M/M ELECTRIC CODE BEACON OF THE DOUBLE FRESNEL LENS TYPE, EQUIPPED WITH TWO 500-WATT GENERAL LIGHTING SERVICE LAMPS, TYPE PS-40, CLEAR, MOGUL PREFOCUS BASE (BOTH LAMPS TO BURN SIMULTANEOUSLY), AND AVIATION RED COLOR SHADES. THE 300 M/M CODE BEACON TO BE EQUIPPED WITH A FLASHING MECHANISM PRODUCING 40 FLASHES PER MINUTE, HAVING A LUMINOUS PERIOD OF ONE SECOND AND A PERIOD OF DARKNESS OF ONE-HALF SECOND.

"AT BOTH THE ONE-THIRD AND TWO-THIRDS LEVELS OF EACH TOWER THERE SHALL BE INSTALLED 100-WATT LAMPS ARRANGED SO THAT ONE LAMP AT EACH LEVEL SHALL BE VISIBLE FROM ANY ANGLE OF APPROACH.

"ALL 100-WATT LAMPS TO BE TYPE A-21 CLEAR BULB TRAFFIC SIGNAL LAMPS (2000 HOURS).

"ALL LAMPS SHALL BE ENCLOSED IN AVIATION RED PRISMATIC OBSTRUCTION LIGHT GLOBES AND ALL LIGHTING SHALL BE EXHIBITED FROM DUSK TO DAWN."

M. SAMPLING LOOPS AND A RCA TYPE 300A PHASE MONITOR HAVE BEEN INSTALLED TO INDICATE THE RELATIVE FIELDS BEING RADIATED FROM EACH TOWER AND THE PHASE BETWEEN THESE FIELDS. BEFORE ADJUSTING THE DIRECTIONAL ANTENNA, EACH ELEMENT WAS OPERATED NON-DIRECTIONAL WITH THE OTHER ELEMENTS FLOATING. AFTER THE CURRENT AND PHASE RATIOS HAD BEEN PROPERLY ADJUSTED, THE INDICATIONS FROM THE MONITORING EQUIPMENT WERE AS FOLLOWS:

	<u>LOOP METER</u> <u>1000 WATTS</u>	<u>LOOP METER</u> <u>5000 WATTS</u>	<u>ACTUAL</u> <u>PHASE</u>	<u>INDICATED</u> <u>PHASE</u>
NORTH	3.02	6.60	PLUS 38°	PLUS 42°
SOUTH	4.80	10.50	00°	00°

RESULTS OF MEASUREMENTS

WITH THE ABOVE OPERATING CONDITIONS, FIELD INTENSITY MEASUREMENTS HAVE BEEN MADE ON THE KNFT DIRECTIONAL ANTENNA SYSTEM ALONG 12 RADIALS. A STUDY OF FIELD INTENSITY MEASUREMENTS SHOWS THE FOLLOWING UNATTENUATED FIELD TO BE

OBTAINED WHEN OPERATING AS SPECIFIED ABOVE:

<u>DIRECTION</u>	UNATTENUATED FIELD		<u>PROTECTING</u>
	<u>1000 WATTS</u> <u>DIRECTIONAL</u>	<u>5000 WATTS</u> <u>DIRECTIONAL</u>	
N 10.5 E	270	604	MILWAUKEE, WIS.
N 39.0 E	82	183	
N 72.4 E	290	649	
N 109.0 E	86	192	
N 130.0 E	165	369	TAMPA, FLORIDA
N 155.5 E	215	481	
N 181.0 E	155	347	
N 202.0 E	84	188	
N 238.6 E	300	671	PHOENIX, ARIZONA
N 272.0 E	80	179	
N 300.5 E	280	626	
N 335.5 E	295	660	

THE UNATTENUATED FIELDS FOR EACH DIRECTION HAVE BEEN PLOTTED ON POLAR GRAPH PAPER TO DETERMINE THE UNATTENUATED GROUND-WAVE PATTERNS. A STUDY OF THE GROUND-WAVE PATTERNS SHOWS THAT THE R.M.S. UNATTENUATED FIELD IS 214 MILLIVOLTS PER METER FOR THE 1000-WATT DIRECTIONAL OPERATION AND 478 MILLIVOLTS PER METER FOR THE 5000-WATT DIRECTIONAL OPERATION.

THE ATTENUATED 25 MILLIVOLT PER METER CONTOURS FOR BOTH 1000-WATT AND 5000-WATT OPERATIONS HAVE BEEN PLOTTED ON MAPS TO SHOW THE AREA COVERED IN THE VICINITY OF WICHITA FALLS, TEXAS BY THESE CONTOURS.

TO AID IN THE ANALYSIS OF THE MEASUREMENTS OF FIELD INTENSITY FROM THE DIRECTIONAL OPERATION, MEASUREMENTS WERE ALSO CARRIED OUT IN THE NULL DIRECTIONS OPERATING NON-DIRECTIVE WITH 1000 WATTS IN THE SOUTH ELEMENT. THE BASE RESISTANCE OF THE SOUTH ELEMENT WAS MEASURED IN ACCORDANCE WITH THE PROCEDURE SPECIFIED IN THE FEDERAL COMMUNICATIONS COMMISSION STANDARDS OF GOOD ENGINEERING PRACTICE, AND DETERMINED TO BE 36.1 OHMS.

DURING THESE NON-DIRECTIONAL MEASUREMENTS, THE CURRENT AT THE BASE OF THE SOUTH ELEMENT WAS MAINTAINED AT 5.26 AMPERES. THE NORTH ELEMENT WAS FLOATED ABOVE GROUND WHILE TAKING NON-DIRECTIONAL MEASUREMENTS. AN ANALYSIS OF THE ABOVE MEASUREMENTS INDICATES THE FOLLOWING:

<u>DIRECTION</u>	<u>UNATTENUATED FIELD 1000 WATTS NON-DIRECTIONAL</u>
N 39.0 E	195
N 109.0 E	195
N 202.0 E	195
N 272.0 E	195

THE FOLLOWING EXHIBITS WILL BE FOUND ATTACHED:

EXHIBIT 1 IS THE BASE IMPEDANCE AT THE SOUTH TOWER WHEN OPERATING NON-DIRECTIONAL WITH THE NORTH TOWER FLOATING.

EXHIBIT 2 IS A SCHEMATIC DIAGRAM OF THE KWFT DIRECTIONAL ANTENNA PHASING AND COUPLING EQUIPMENT.

EXHIBIT 3A IS A POLAR DIAGRAM OF THE UNATTENUATED FIELD IN THE HORIZONTAL PLANE ABOUT THE KWFT DIRECTIONAL ANTENNA FOR 1000-WATT OPERATION.

EXHIBIT 3B IS A POLAR DIAGRAM OF THE UNATTENUATED FIELD IN THE HORIZONTAL PLANE ABOUT THE KWFT DIRECTIONAL ANTENNA FOR 5000-WATT OPERATION.

ALL OF THE ADJUSTMENTS WERE CARRIED OUT BY ME. ALL OF THE FIELD INTENSITY MEASUREMENTS WERE MADE BY MR. C. M. DANIELL, ASSOCIATE ENGINEER. I AM FAMILIAR WITH THE OPERATION AND HAVE EXAMINED ALL OF THE EXHIBITS. IT IS MY BELIEF THAT

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THE DIRECTIONAL ANTENNA AS INSTALLED COMPLIES WITH ALL OF THE
TERMS AND CONDITIONS OF THE KWFT CONSTRUCTION PERMIT,
FILE #B3-P-2461.

A. EARL CULLUM, JR.

OCTOBER 29, 1940

STATE OF TEXAS)
) ss.
COUNTY OF DALLAS)

A. EARL CULLUM, JR., BEING DULY SWORN, UPON HIS OATH
DEPOSES AND SAYS THAT THE FACTS STATED IN THE FOREGOING,
TOGETHER WITH ALL EXHIBITS ATTACHED THERETO, ARE TRUE
OF HIS OWN KNOWLEDGE, EXCEPT AS TO SUCH STATEMENTS AS
THEREIN STATED TO BE ON INFORMATION AND BELIEF, AND AS TO
SUCH STATEMENTS HE BELIEVES THEM TO BE TRUE.

A. EARL CULLUM, JR.

SWORN TO AND SUBSCRIBED BEFORE ME THIS 29TH DAY OF OCTOBER,
1940.

NOTARY PUBLIC IN AND FOR
DALLAS COUNTY, TEXAS

MY COMMISSION EXPIRES JUNE 1, 1941.

RADIO STATION KWFT DIRECTIONAL ANTENNA SPECIFICATIONS

CONSTRUCTION PERMIT B3-P-2461 ISSUED TO THE WICHITA
BROADCASTING COMPANY, WICHITA FALLS, TEXAS, INCLUDED THE
FOLLOWING DIRECTIONAL ANTENNA SPECIFICATIONS:

"No. & TYPE OF ELEMENTS: 2, SELF-SUPPORTING, INSULATED.
HEIGHT: 400' (910) ABOVE INSULATORS, 405' OVERALL.
SPACING: 1398' (317°) BETWEEN TOWERS.
ORIENTATION: LINE OF TOWERS BEARING 155.50° TRUE.
PHASING: NORTH TOWER 38°, SOUTH TOWER 0°.
CURRENT RATIO: NORTH TOWER 0.51, SOUTH TOWER 1.0.

THE INVERSE DISTANCE NIGHTTIME FIELD INTENSITY AT A
DISTANCE OF ONE MILE FROM THE ANTENNA IN THE DIRECTIONS OF
THE CITIES SPECIFIED SHALL NOT EXCEED THE FOLLOWING VALUES:

KWFT No. 1, DIRECTION OF PHOENIX, ARIZ. 38 mv/m
KWFT No. 2, DIRECTION OF MILWAUKEE, WISC. 88 mv/m
KWFT No. 3, DIRECTION OF TAMPA, FLA. 38 mv/m

A MONITORING POINT IN EACH OF THE ABOVE DIRECTIONS IN
WHICH A FIELD INTENSITY IS SPECIFIED SHALL BE DESIGNATED
WITH COMPLETE DETAIL INCLUDING A DESCRIPTION OF THE POINT,
DIRECTIONS FOR PROCEEDING THERETO AND THE FIELD INTENSITY
MEASURED AT THE POINT AFTER FINAL ADJUSTMENT OF THE ANTENNA
SYSTEM, AND WHEN OPERATING IN EXACT ACCORDANCE WITH THE
TERMS OF THIS AUTHORIZATION AND THE RULES AND REGULATIONS
AND STANDARDS OF GOOD ENGINEERING PRACTICE GOVERNING STANDARD
BROADCAST STATIONS. THE POINTS SHALL BE IN THE CLEAR SO AS
TO PERMIT THE TAKING OF UNOBSTRUCTED FIELD INTENSITY
MEASUREMENTS AND SHALL BE LOCATED NOT LESS THAN ONE MILE
NOR MORE THAN FOUR MILES FROM THE ANTENNA IN THE DIRECTION
SPECIFIED.

NO OPERATION SHALL OCCUR DURING THE REGULAR BROADCAST
DAY UNTIL DATA HAS BEEN SUBMITTED SHOWING THAT OPERATION
IS IN ACCORDANCE WITH THE ABOVE SPECIFICATIONS AND THAT THE
FIELD INTENSITY IS IN SUBSTANTIAL AGREEMENT WITH THE
THEORETICAL PATTERN SPECIFIED IN THE APPLICATION."

(E)

NON-DIRECTIVE ANTENNA BASE IMPEDANCE
 RADIO STATION KWFT, WICHITA FALLS, TEXAS
 A. EARL CULLUM, JR. CONSULTING ENGINEER
 SEPTEMBER 29, 1940

FREQUENCY KILOCYCLES	CAPACITANCE ONLY R_0	C_0	ANT. & CAP. SER. R_1	C_1	ANTENNA R	IMPEDANCE X
570	0.0	504	24.3	500	24.3	-05
580	0.0	504	26.3	505	26.3	+01
590	0.0	504	28.3	509	28.3	+05
600	0.0	504	30.7	513	30.7	+09
610	0.0	504	33.2	518	33.2	+14
620	0.0	504	36.1	522	36.1	+18
630	0.0	504	39.3	528	39.3	+23
640	0.0	504	42.8	532	42.8	+26
650	0.0	504	46.8	538	46.8	+31
660	0.0	504	51.2	545	51.2	+37
670	0.0	504	55.9	551	55.9	+41

MEASUREMENTS BY USE OF SERIES STANDARDS

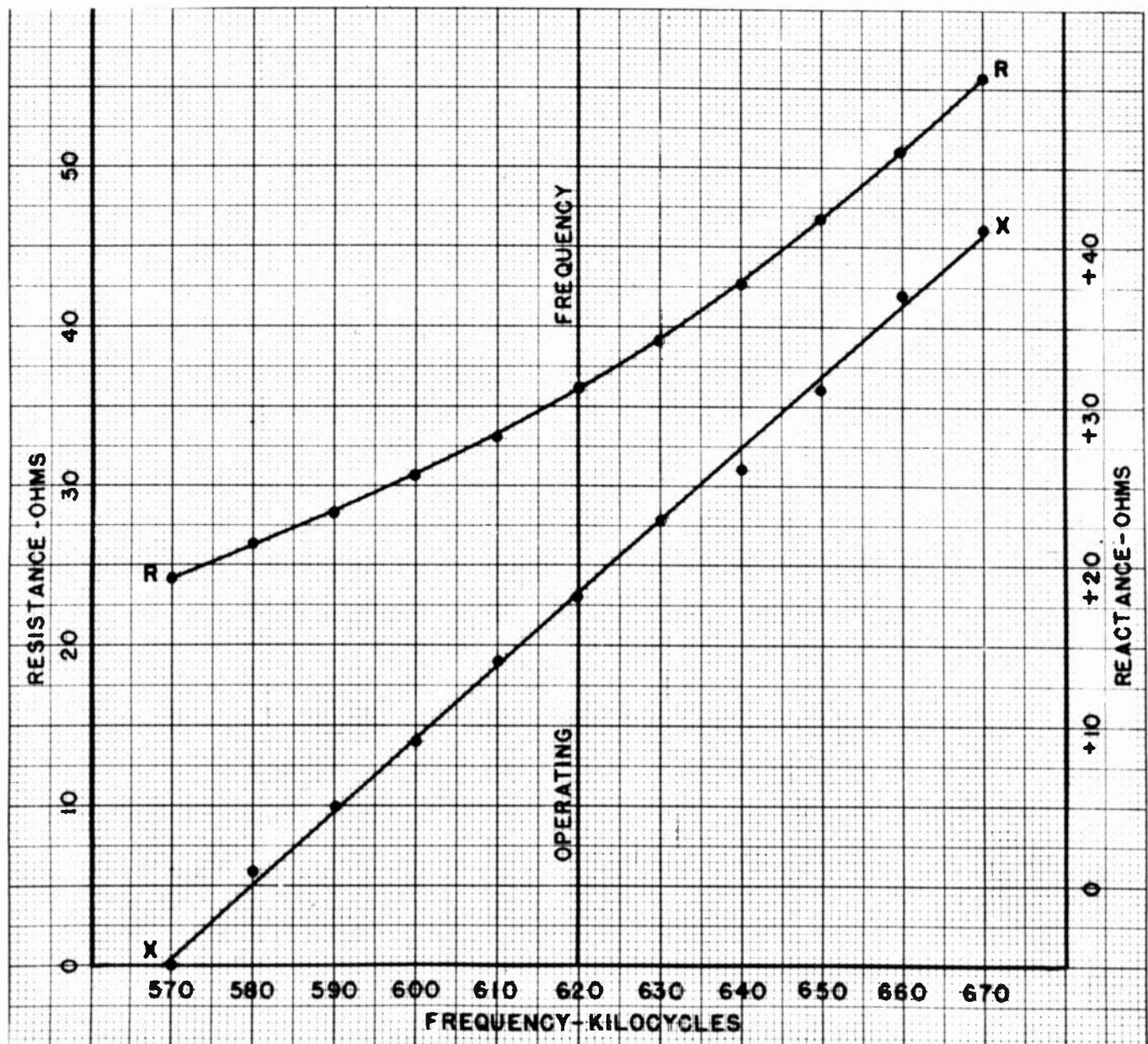
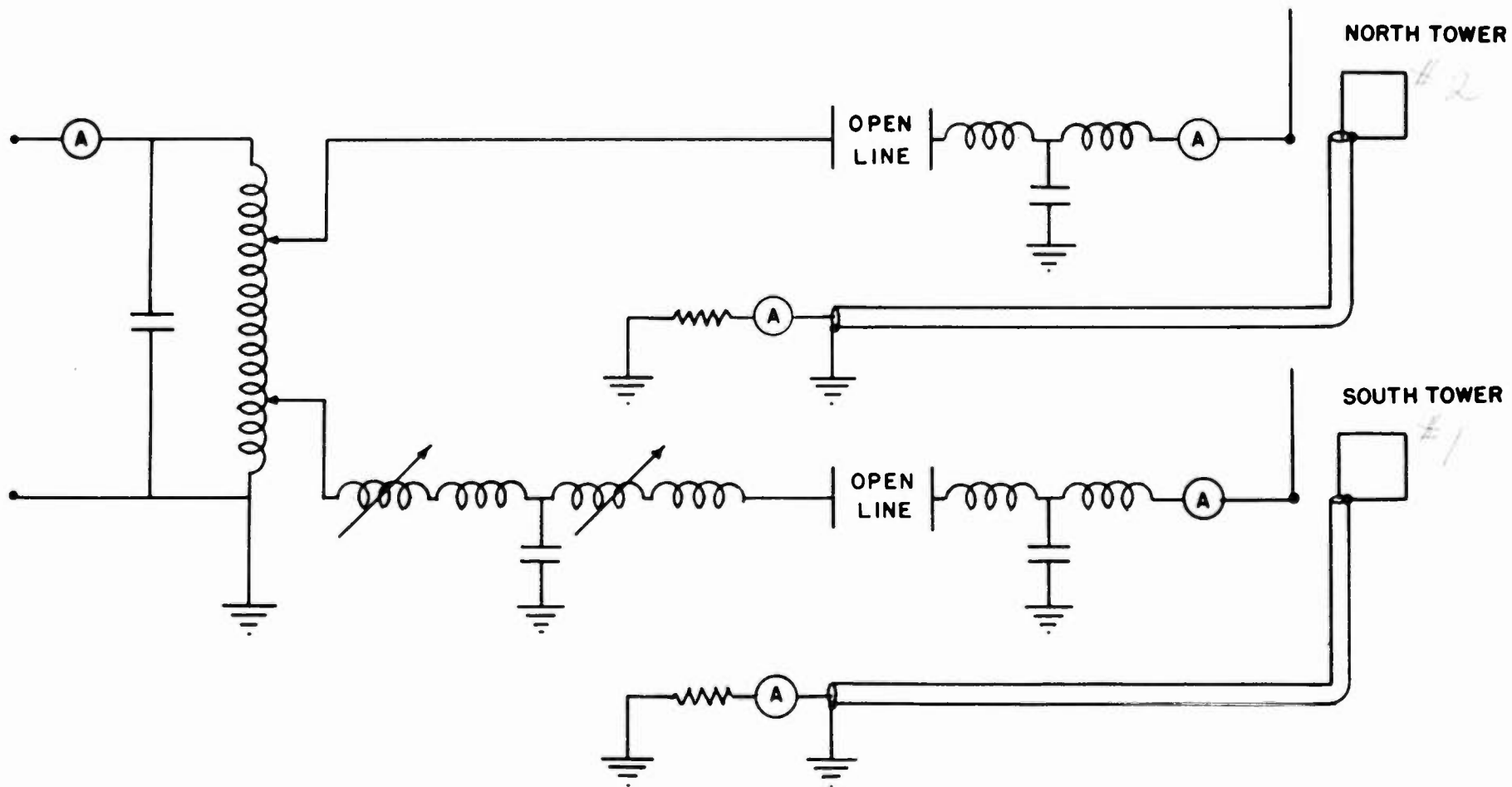
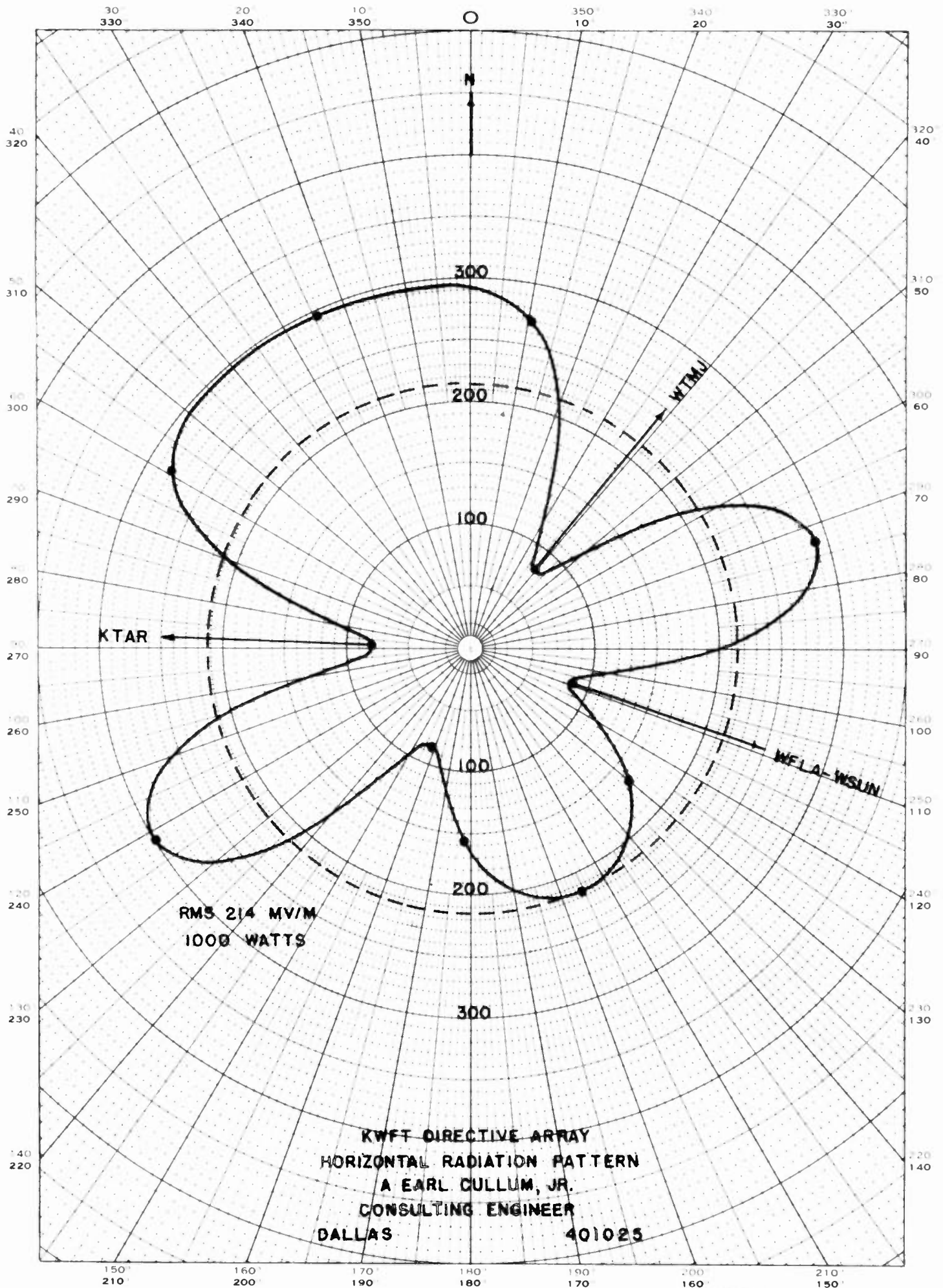
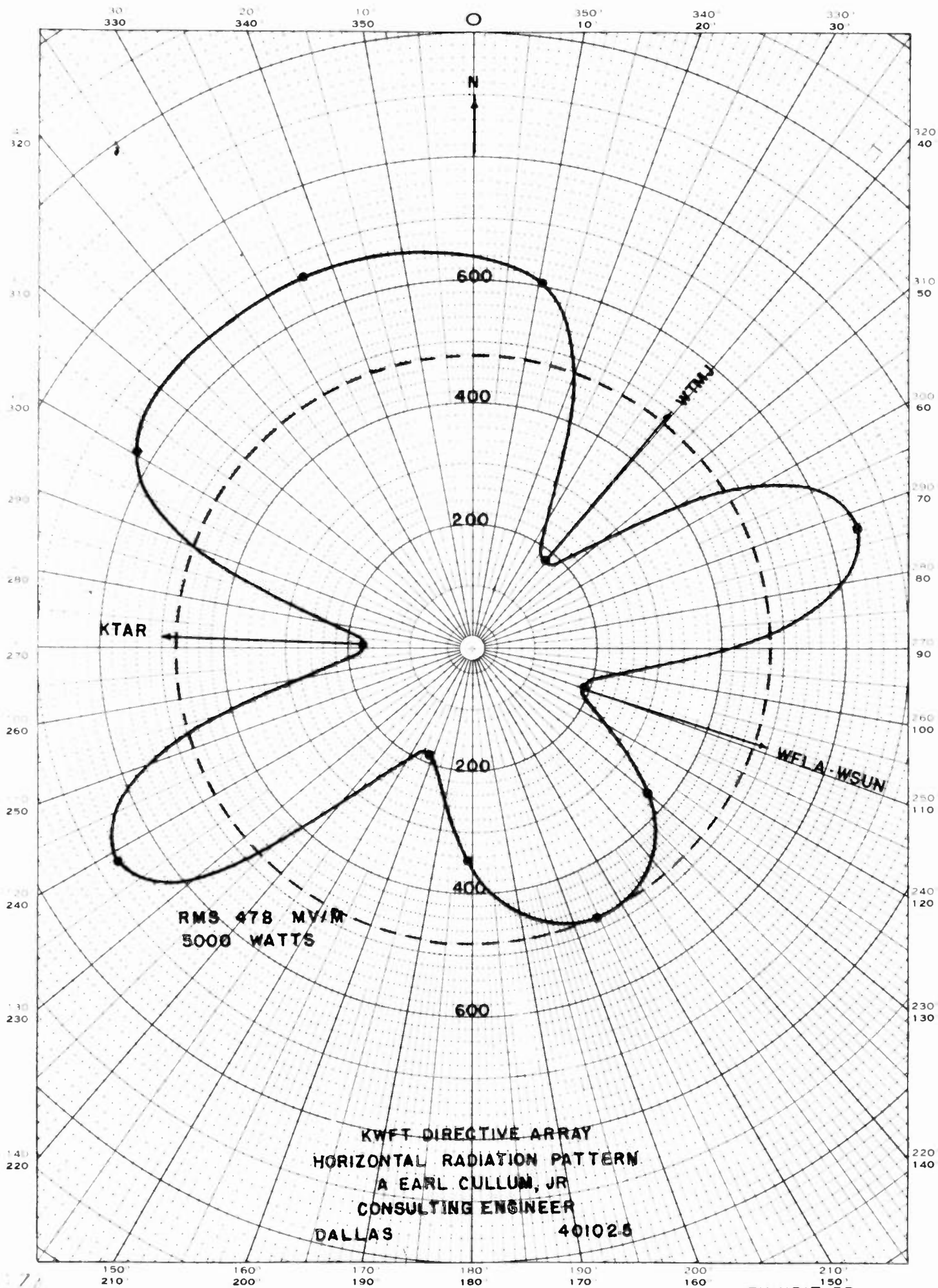


EXHIBIT I



KWFT ANTENNA SYSTEM-A. EARL CULLUM, JR., CONSULTING ENGINEER





AFFIDAVIT OF C. M. DANIELL, CONCERNING THE
MEASUREMENTS MADE TO DETERMINE THE PERFORMANCE
OF THE ANTENNA SYSTEM INSTALLED BY KWFT, WICHITA
FALLS, TEXAS, FOR OPERATION ON 620 KILOCYCLES,
5000 WATTS DAYTIME, 1000 WATTS NIGHTTIME, USING
A DIRECTIONAL ANTENNA BOTH DAY AND NIGHT.

I, C. M. DANIELL, AM A CONSULTING RADIO ENGINEER
ASSOCIATED WITH A. EARL CULLUM, JR. OF DALLAS, TEXAS. I HAVE
BEEN EMPLOYED TO MAKE FIELD INTENSITY MEASUREMENTS ON THE
DIRECTIVE ANTENNA SYSTEM AS INSTALLED BY KWFT, WICHITA FALLS,
TEXAS TO DETERMINE THE PERFORMANCE THEREOF. I HAVE ALSO BEEN
EMPLOYED TO MAKE FIELD INTENSITY MEASUREMENTS ON THE NON-
DIRECTIVE OPERATION OF KWFT PREVIOUS TO THE INSTALLATION OF
THE DIRECTIVE ANTENNA SYSTEM.

FIELD INTENSITY MEASUREMENTS HAVE BEEN MADE ON THE KWFT
DIRECTIVE ANTENNA ALONG 12 RADIALS. THE POINTS AT WHICH THE
FIELD INTENSITY MEASUREMENTS WERE MADE ARE SHOWN ON THE
ATTACHED POINT LOCATION MAPS. ALL OF THE FIELD INTENSITY
MEASUREMENTS WERE MADE WHEN OPERATING WITH 1000 WATTS TO THE
ANTENNA SYSTEM IN ACCORDANCE WITH THE FEDERAL COMMUNICATIONS
COMMISSION STANDARDS OF GOOD ENGINEERING PRACTICE, AND HAVE
BEEN TABULATED ON THE FOLLOWING ATTACHED EXHIBITS:

EXHIBITS 4A TO 4P ARE TABULATED DATA AND PLOTTED CURVES SHOWING
THE FOLLOWING:

1. DIRECTION FROM ANTENNA TO EACH POINT OF MEASUREMENT.
2. DATE ON WHICH EACH MEASUREMENT WAS MADE.
3. NUMBER GIVEN TO EACH POINT OF MEASUREMENT.
4. TIME AT WHICH EACH MEASUREMENT WAS MADE.
5. INTENSITY IN MILLIVOLTS PER METER AT EACH POINT OF
MEASUREMENT.

6. DISTANCE IN MILES FROM ANTENNA TO EACH POINT OF MEASUREMENT.
7. PRODUCT OF INTENSITY TIMES DISTANCE TO EACH POINT OF MEASUREMENT.
8. TYPE OF OPERATION - DIRECTIVE OR NON-DIRECTIVE.

EXHIBIT 5 IS A FAMILY OF ED CURVES PLOTTED FOR 620 KILOCYCLES FOR SOIL CONDUCTIVITIES VARYING FROM 40 TIMES 10 TO THE MINUS 14TH TO 10 TIMES 10 TO THE MINUS 14TH. ALSO SHOWN IS THE INVERSE DISTANCE CURVE FOR NO ATTENUATION.

EXHIBIT 6 IS A DESCRIPTION OF THE KWFT MONITORING POINTS. AFTER THE 12 RADIALS HAD BEEN COMPLETED, THE DATA ANALYZED, AND FOUND TO PROVIDE THE FOLLOWING PATTERN, MONITORING POINTS WERE ESTABLISHED IN THE DIRECTION OF MILWAUKEE, WISCONSIN, TAMPA, FLORIDA, AND PHOENIX, ARIZONA.

EXHIBIT 7 IS A POINT LOCATION MAP SHOWING THE POINTS AT WHICH MEASUREMENTS OF FIELD INTENSITY WERE MADE BETWEEN 0.10 MILE AND 2.50 MILES. MEASUREMENTS WERE MADE AT THESE POINTS ONLY ON THE NON-DIRECTIONAL OPERATION.

EXHIBIT 8 IS A POINT LOCATION MAP SHOWING THE POINTS AT WHICH MEASUREMENTS OF FIELD INTENSITY WERE MADE BETWEEN 2.50 MILES AND 20 MILES.

EXHIBIT 9A IS A MAP OF WICHITA FALLS AND VICINITY SHOWING THE AREA INCLUDED WITHIN THE 25 MILLIVOLTS PER METER CONTOUR FOR 1000-WATT DIRECTIONAL OPERATION.

PAGE 3

EXHIBIT 9B IS A MAP OF WICHITA FALLS AND VICINITY SHOWING THE AREA INCLUDED WITHIN THE 25 MILLIVOLTS PER METER CONTOUR FOR 5000-WATT DIRECTIONAL OPERATION.

ALL OF THE FIELD INTENSITY MEASUREMENTS WERE MADE BY ME. I USED RCA FIELD INTENSITY METER, TYPE TMV75B, SERIAL 575, LAST CALIBRATED BY THE RCA MANUFACTURING COMPANY ON AUGUST 19, 1940.

THE MEASUREMENTS ON KWFT WERE TAKEN AT THE BEST AVAILABLE POINTS. I PREPARED THE GRAPHICAL ANALYSIS OF THE MEASUREMENTS, AND IT IS MY BELIEF THAT THESE ANALYSES INDICATE THE EXISTING OPERATING CONDITIONS OF THE KWFT ANTENNA SYSTEM.

C. M. DANIELL

OCTOBER 29, 1940

STATE OF TEXAS)
) ss.
COUNTY OF DALLAS)

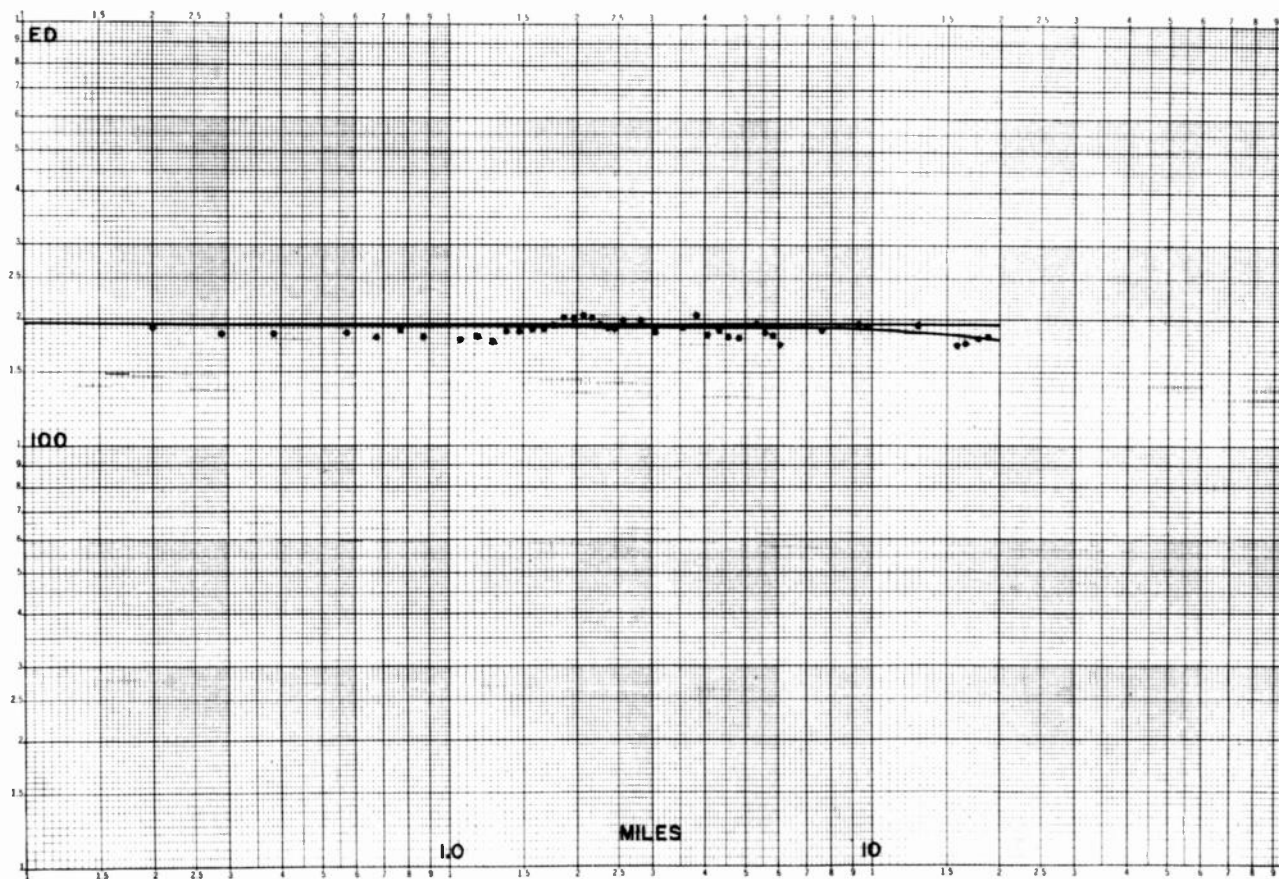
C. M. DANIELL, BEING DULY SWORN, UPON HIS OATH DEPOSES AND
SAYS THAT THE FACTS STATED IN THE FOREGOING, TOGETHER WITH
ALL EXHIBITS ATTACHED THERETO, ARE TRUE OF HIS OWN KNOWLEDGE,
EXCEPT AS TO SUCH STATEMENTS AS THEREIN STATED TO BE ON
INFORMATION AND BELIEF, AND AS TO SUCH STATEMENTS HE BELIEVES
THEM TO BE TRUE.

C. M. DANIELL

SWORN TO AND SUBSCRIBED BEFORE ME THIS 29TH DAY OF OCTOBER,
1940.

NOTARY PUBLIC IN AND FOR
DALLAS COUNTY, TEXAS

MY COMMISSION EXPIRES JUNE 1, 1941.

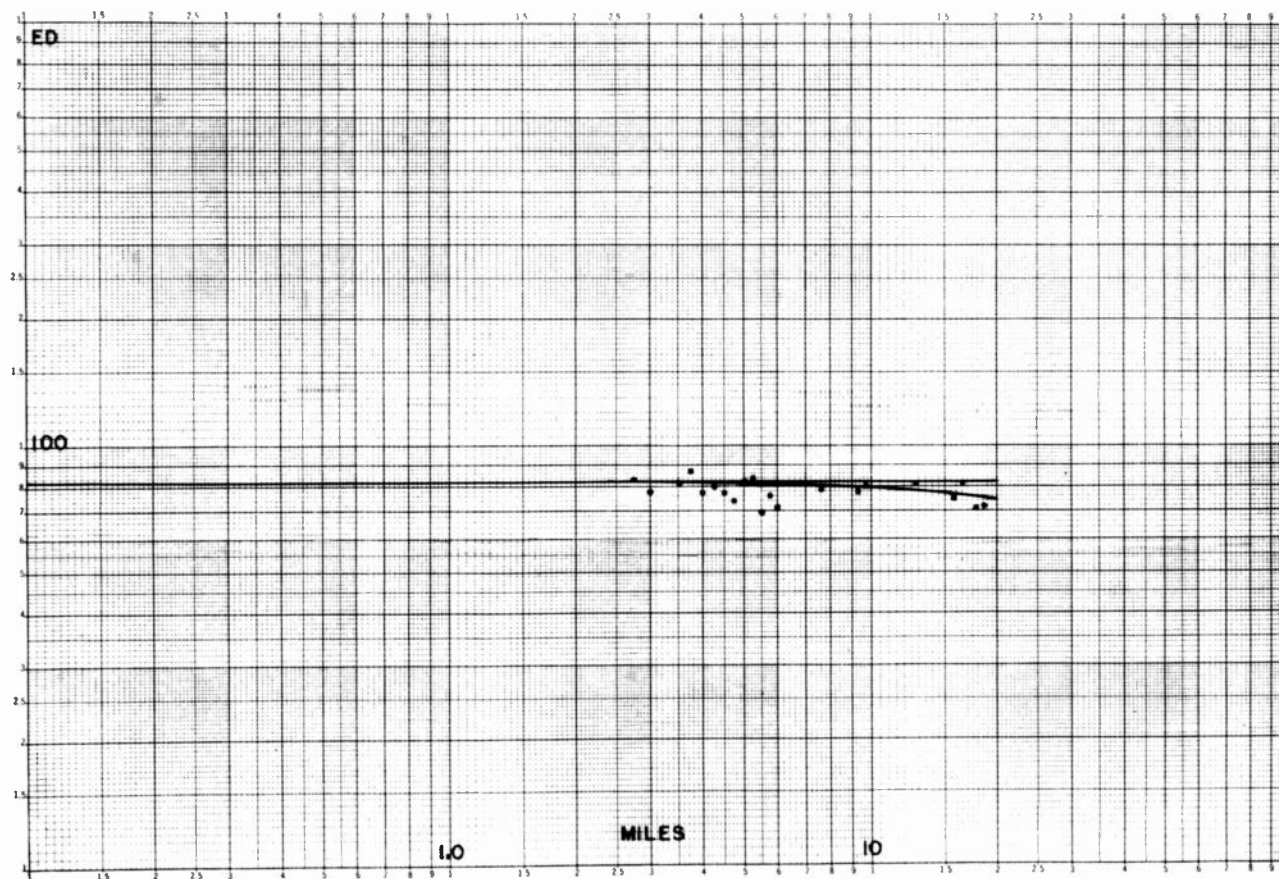


A. EARL CULLUM, JR.
CONSULTING RADIO ENGINEER
HIGHLAND PARK VILLAGE
DALLAS, TEXAS

RADIO STATION KFT
620 KC - 1000 WATTS-400-DA
RADIAL NORTH 33.0 DEGREES EAST
SEPT. 28, 1940, AND 30, 1940

P	TIME	E	D	ED	CONTENTS
1B	9:40 AM	956	0.200	191	
2B	9:40 AM	508	0.220	185	
3B	9:40 AM	478	0.385	184	
4B	9:40 AM	351	0.480	186	UNLOCATED
5B	9:40 AM	270	0.577	182	
6B	9:40 AM	245	0.675	189	
7B	9:40 AM	208	0.773	181	
8B	9:40 AM	160	0.870	178	LINES
9B	9:40 AM	120	0.970	161	
10B	9:40 AM	140	1.065	177	
11B	9:40 AM	130	1.165	185	
12B	9:40 AM	127	1.265	186	
13B	9:40 AM	121	1.365	187	
14B	9:40 AM	114	1.465	185	CREEK
15B	9:40 AM	110	1.565	194	
16B	9:40 AM	108	1.660	201	POINTS NUMBERS
17B	9:40 AM	100	1.760	200	182 TO 258 ON
18B	9:40 AM	90	1.860	204	GENERALLY RISING
19B	9:40 AM	86.1	1.960	202	ELEVATION
20B	9:40 AM	80.6	2.060	195	
21B	9:40 AM	77.2	2.160	190	
22B	9:40 AM	72.6	2.260	180	
23B	9:40 AM	70.1	2.360	183	
24B	9:40 AM	66.0	2.460	180	BEHIND HILL
25B	9:40 AM	60.0	2.560	186	BEHIND HILL
26B	9:40 AM	50.0	2.660	170	LINES
27B	9:40 AM	40.0	2.760	205	
28B	9:40 AM	30.0	2.860	184	
29B	9:40 AM	20.0	2.960	183	
30B	9:40 AM	10.0	3.060	180	
31B	9:40 AM	0.0	3.160	180	
32B	9:40 AM	0.0	3.260	180	
33B	9:40 AM	0.0	3.360	180	
34B	9:40 AM	0.0	3.460	180	
35B	9:40 AM	0.0	3.560	180	
36B	9:40 AM	0.0	3.660	180	
37B	9:40 AM	0.0	3.760	180	
38B	9:40 AM	0.0	3.860	180	
39B	9:40 AM	0.0	3.960	180	
40B	9:40 AM	0.0	4.060	180	
41B	9:40 AM	0.0	4.160	180	
42B	9:40 AM	0.0	4.260	180	
43B	9:40 AM	0.0	4.360	180	
44B	9:40 AM	0.0	4.460	180	
45B	9:40 AM	0.0	4.560	180	
46B	9:40 AM	0.0	4.660	180	
47B	9:40 AM	0.0	4.760	180	
48B	9:40 AM	0.0	4.860	180	

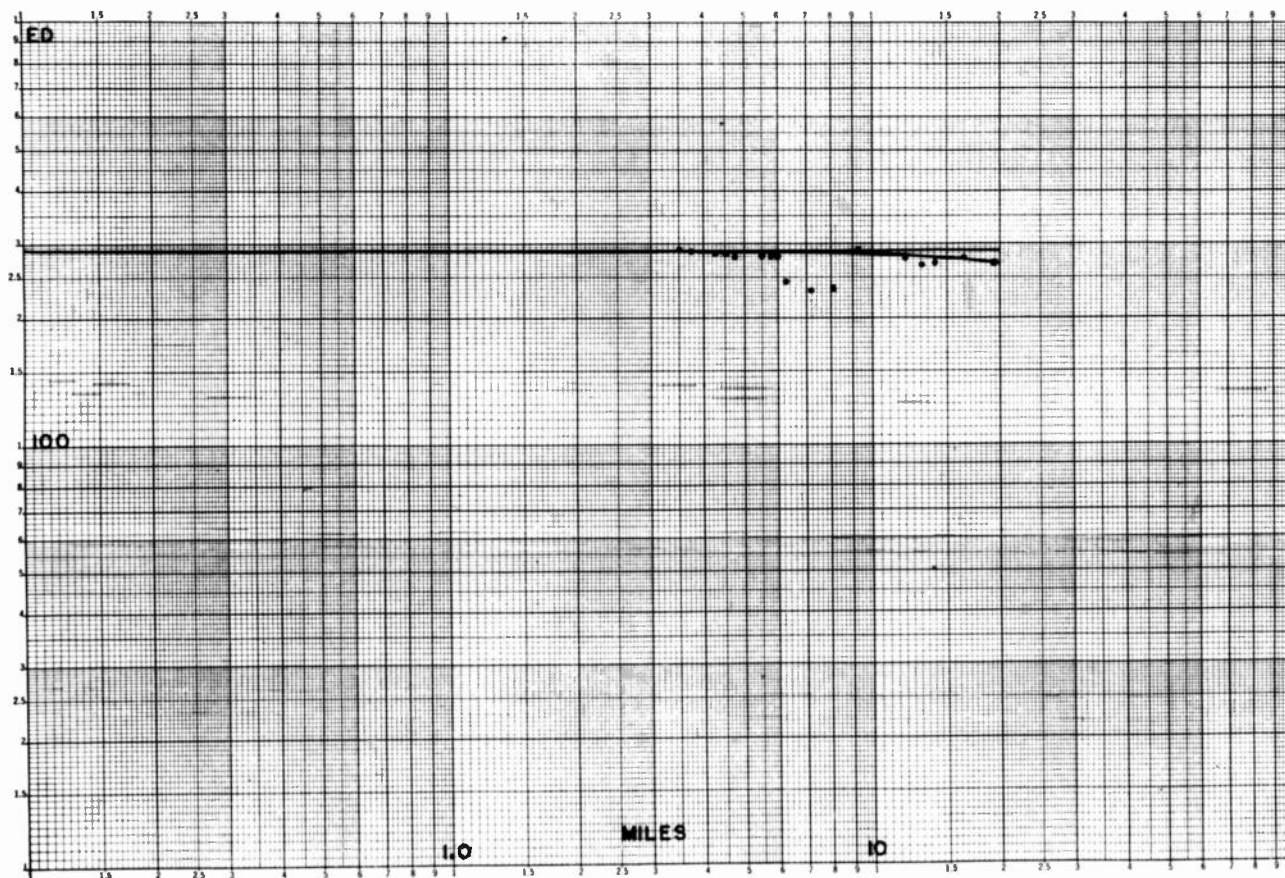
EXHIBIT 4B



A. EARL CULLUM, JR.
CONSULTING RADIO ENGINEER
HIGHLAND PARK VILLAGE
DALLAS, TEXAS
RADIO STATION, KWFT
650 KC - 1000 WATTS-PA
RADIAL NORTH 30.0 DEGREES EAST
OCTOBER 9 AND 11, 1940

P	TIME	E	D	ED	COMMENTS
60D	9:10 AM	30.4	1.70	98.0	BEHIND HILL
67L	9:41 AM	20.4	0.40	78.0	BEHIND HILL
60P	11	11	0.25	11	LINES
61B	9:40 AM	20.4	0.50	81.0	
60B	9:45 AM	20.4	0.75	87.0	
61B	9:50 AM	11.4	0.50	77.0	
60P	10:10 AM	18.5	4.25	80.0	
60P	10:05 AM	17.1	4.50	77.0	
60P	10:15 AM	10.6	4.75	74.0	
60B	10:50 AM	16.5	5.1	80.5	
60B	11:00 AM	15.8	0.50	80.0	
67B	11:04 AM	15.5	1.50	68.8	
66E	11:20 AM	10.5	1.70	70.0	CREEK BOTTOMS
67B	11:30 AM	11.7	1.50	70.3	BEHIND MC 2 JO
60B	11:10 AM	10.3	7.00	78.0	
61P	11:30 AM	8.20	0.50	78.1	
64E	11:35 AM	8.00	1.75	71.7	
64P	11:50 AM	6.00	12.5	80.8	
64P	12:01 PM	4.70	15.50	74.4	RED RIVER SAND
60P	12:00 PM	4.00	16.00	81.0	RED RIVER SAND
60P	12:00 PM	3.07	17.50	70.9	RED RIVER SAND
67P	12:40 PM	3.21	18.55	71.1	RED RIVER SAND

EXHIBIT 4C

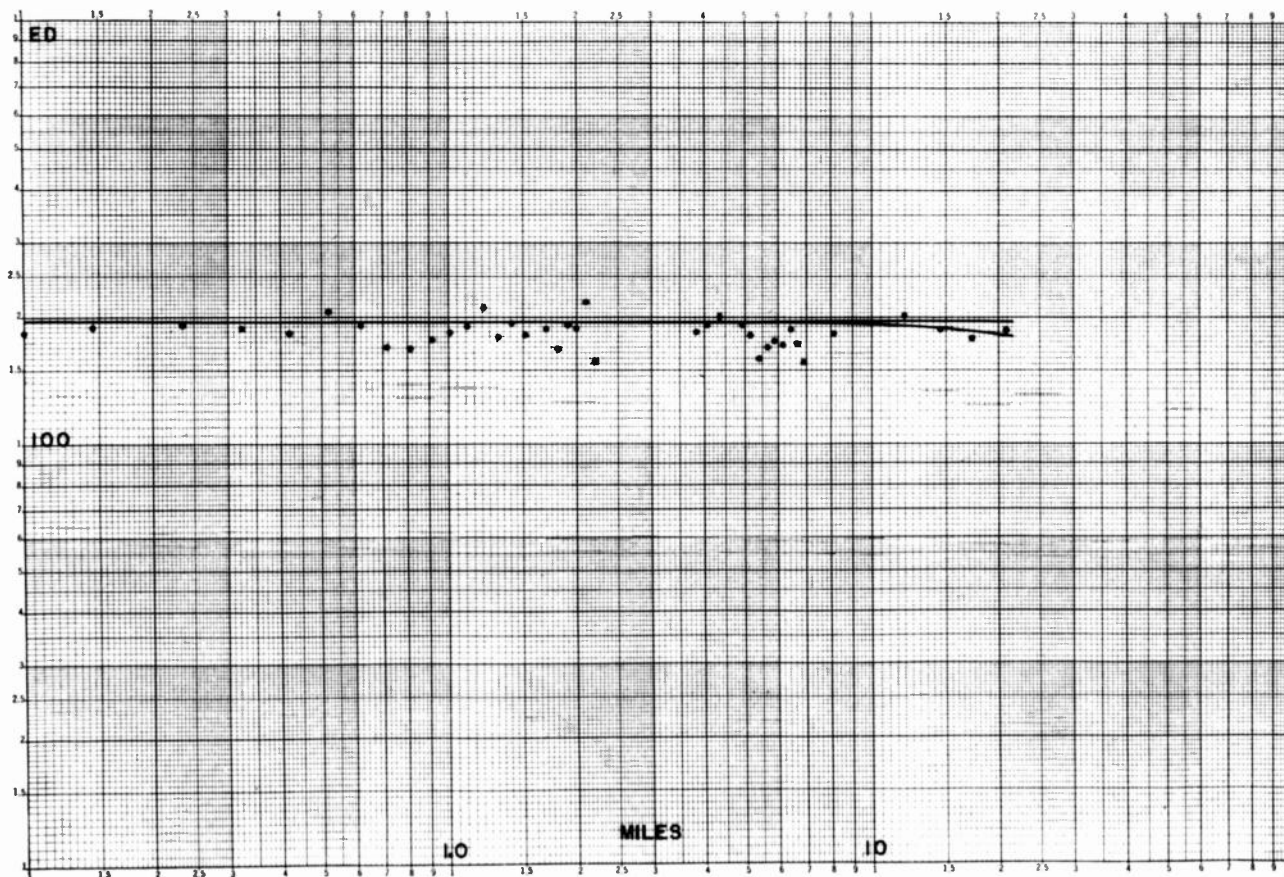


A. EARL CULLUM, JR.
CONSULTING RADIO ENGINEER
HIGHLAND PARK VILLAGE
DALLAS, TEXAS

RADIO STATION KWFT
650 KC - 1000 WATTS-DA
RADIAL NORTH 72.4 DEGREES EAST
OCTOBER 13 AND 16, 1940

P	TIME	E	D	ED	COMMENTS
240	2:55 PM	60.0	3.50	200	
270	2:43 PM	76.7	3.75	183	
280	XX	XX	4.00	X	LINES
270	2:50 PM	67.0	4.25	185	
300	3:00 PM	60.0	4.50	184	
310	3:11 PM	50.0	4.75	180	
320	3:10 PM	54.4	5.00	182	
330	XX	XX	5.25	X	LINES
340	3:53 PM	51.0	5.50	200	
350	3:45 PM	48.5	5.75	280	
360	4:00 PM	47.0	6.00	182	
370	4:00 PM	36.0	6.10	264	WICHITA RIVER
380	3:50 PM	32.6	7.15	130	WICHITA RIVER
390	4:00 PM	30.3	7.05	206	WICHITA RIVER
400	4:46 PM	31.0	7.25	591	
410	4:30 PM	23.5	11.05	278	
420	5:10 PM	20.0	11.05	208	
430	5:18 PM	19.4	14.00	172	
440	5:17 PM	17.1	16.30	173	
450	5:30 PM	10.8	19.40	208	

EXHIBIT 4D



A. EARL CULLUM, JR.
CONSULTING RADIO ENGINEER
HIGHLAND PARK VILLAGE
DALLAS, TEXAS

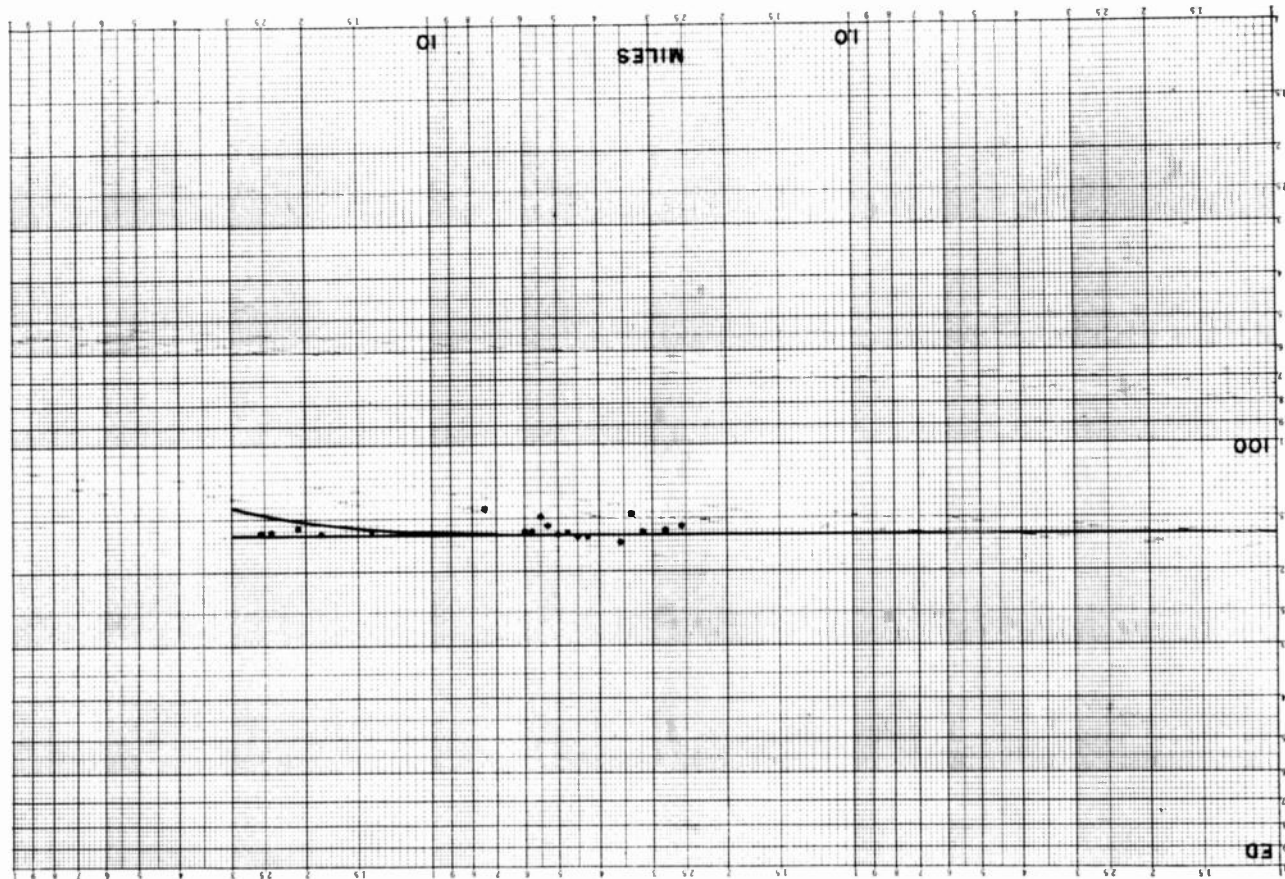
RADIO STATION KWFT
620 KC - 1000 WATTS-NON-DM
RADIAL NORTH 109.0 DEGREES EAST
SEPT. 17, 23*, AND OCT. 1**, 1940

P	TIME	E	D	ED	COMMENTS
1D	1:50 PM	1840.	0.100	184	
2D	1:30 PM	1310.	0.145	190	
3D	1:57 PM	814.	0.235	191	
4D	1:44 PM	578.	0.325	188	
5D	1:55 PM	437.	0.420	184	
6D	2:01 PM	386.	0.520	206	
7D	2:07 PM	308.	0.620	191	
8D	2:14 PM	238.	0.715	170	
9D	2:19 PM	209.	0.810	169	
10D	2:24 PM	195.	0.910	177	
11D	2:28 PM	182.	1.010	184	
12D	2:34 PM	169.	1.110	186	
13D	2:40 PM	173.	1.210	210	
14D	3:12 PM	138.	1.305	180	
15D	3:20 PM	138.	1.405	194	
16D	3:24 PM	121.	1.505	182	
17D	xx	xx	1.605	x	
18D	3:35 PM	111.	1.700	189	
19D	3:41 PM	93.5	1.800	168	
20D	3:46 PM	101.0	1.900	192	
21D	3:51 PM	94.6	2.00	189	
22D	4:01 PM	104.0	2.10	218	
23D	4:10 PM	71.2	2.20	157	
24D	xx	xx	2.30	x	
25D	xx	xx	2.40	x	
26D	2:04 PM*	48.4	3.82	185	
27D	2:08 PM*	47.1	4.06	192	
28D	2:15 PM*	46.2	4.37	202	
29D	xx	xx	4.40	x	
30D	xx	xx	4.65	x	
31D	1:51 PM**	39.0	4.90	191	
32D	2:02 PM**	35.1	5.15	181	
33D	2:19 PM**	29.7	5.40	160	
34D	2:27 PM**	31.9	5.65	180	
35D	2:38 PM**	30.0	5.90	177	
36D	2:53 PM**	27.9	6.15	172	
37D	3:02 PM**	29.1	6.40	186	
38D	3:08 PM**	26.2	6.65	174	
39D	xx	xx	6.90	x	
40D	2:53 PM*	22.4	8.15	183	
41D	3:07 PM*	16.9	12.00	203	
42D	3:19 PM*	12.7	14.70	187	
43D	3:36 PM*	10.3	17.30	178	
44D	3:53 PM*	8.89	20.90	186	

EXHIBIT 4E

POINTS 36 & 37 ALONG
MKT RR. NO LINES.
GOOD NULLS.
LINES



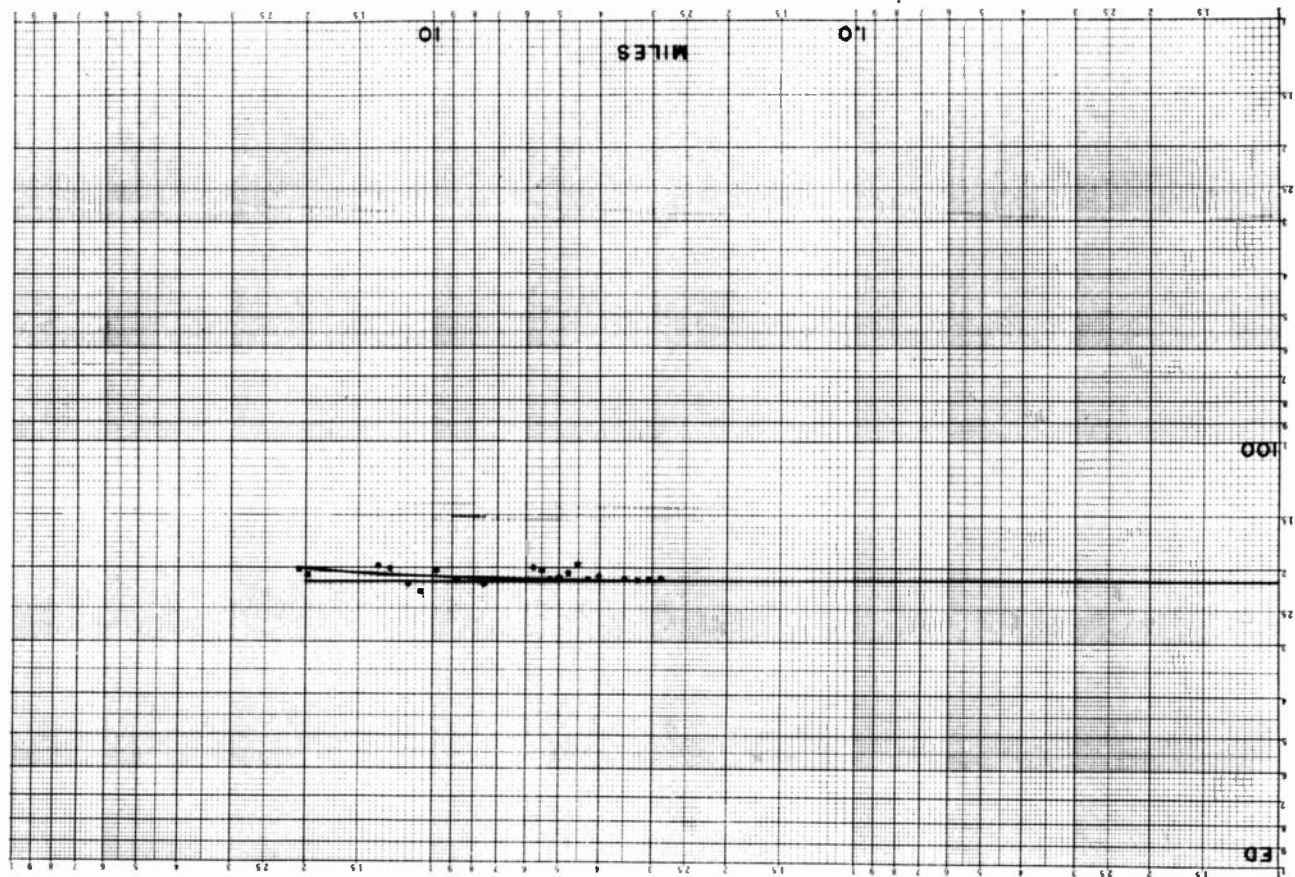


P	TIME	E	D	ED	CC HENTS
11.08	11.08	11.08	11.08	11.08	11.08
11.10	11.10	11.10	11.10	11.10	11.10
11.12	11.12	11.12	11.12	11.12	11.12
11.14	11.14	11.14	11.14	11.14	11.14
11.16	11.16	11.16	11.16	11.16	11.16
11.18	11.18	11.18	11.18	11.18	11.18
11.20	11.20	11.20	11.20	11.20	11.20
11.22	11.22	11.22	11.22	11.22	11.22
11.24	11.24	11.24	11.24	11.24	11.24
11.26	11.26	11.26	11.26	11.26	11.26
11.28	11.28	11.28	11.28	11.28	11.28
11.30	11.30	11.30	11.30	11.30	11.30
11.32	11.32	11.32	11.32	11.32	11.32
11.34	11.34	11.34	11.34	11.34	11.34
11.36	11.36	11.36	11.36	11.36	11.36
11.38	11.38	11.38	11.38	11.38	11.38
11.40	11.40	11.40	11.40	11.40	11.40
11.42	11.42	11.42	11.42	11.42	11.42
11.44	11.44	11.44	11.44	11.44	11.44
11.46	11.46	11.46	11.46	11.46	11.46
11.48	11.48	11.48	11.48	11.48	11.48
11.50	11.50	11.50	11.50	11.50	11.50
11.52	11.52	11.52	11.52	11.52	11.52
11.54	11.54	11.54	11.54	11.54	11.54
11.56	11.56	11.56	11.56	11.56	11.56
11.58	11.58	11.58	11.58	11.58	11.58
12.00	12.00	12.00	12.00	12.00	12.00
12.02	12.02	12.02	12.02	12.02	12.02
12.04	12.04	12.04	12.04	12.04	12.04
12.06	12.06	12.06	12.06	12.06	12.06
12.08	12.08	12.08	12.08	12.08	12.08
12.10	12.10	12.10	12.10	12.10	12.10
12.12	12.12	12.12	12.12	12.12	12.12
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12.16	12.16	12.16	12.16	12.16	12.16
12.18	12.18	12.18	12.18	12.18	12.18
12.20	12.20	12.20	12.20	12.20	12.20
12.22	12.22	12.22	12.22	12.22	12.22
12.24	12.24	12.24	12.24	12.24	12.24
12.26	12.26	12.26	12.26	12.26	12.26
12.28	12.28	12.28	12.28	12.28	12.28
12.30	12.30	12.30	12.30	12.30	12.30
12.32	12.32	12.32	12.32	12.32	12.32
12.34	12.34	12.34	12.34	12.34	12.34
12.36	12.36	12.36	12.36	12.36	12.36
12.38	12.38	12.38	12.38	12.38	12.38
12.40	12.40	12.40	12.40	12.40	12.40
12.42	12.42	12.42	12.42	12.42	12.42
12.44	12.44	12.44	12.44	12.44	12.44
12.46	12.46	12.46	12.46	12.46	12.46
12.48	12.48	12.48	12.48	12.48	12.48
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12.56	12.56	12.56	12.56	12.56	12.56
12.58	12.58	12.58	12.58	12.58	12.58
13.00	13.00	13.00	13.00	13.00	13.00

EXHIBIT 46

A. EARL CULLUM, JR.
CONSULTING RADIO ENGINEER
HIGHLAND PARK VILLAGE
DALLAS, TEXAS

ALL INFORMATION CONTAINED
HEREIN IS UNCLASSIFIED
DATE 10-17-2011 BY 60322
REASON: 16 CFR 1.100 DELETED



A. EARL CULLUM, JR.
CONSULTING RADIO ENGINEER
HIGHLAND PARK VILLAGE
DALLAS, TEXAS

RADIO STATION, 100 FT
RADIAL NORTH 100.0 DEGREES EAST
COTTER 14.4 AND 17.1 MHz

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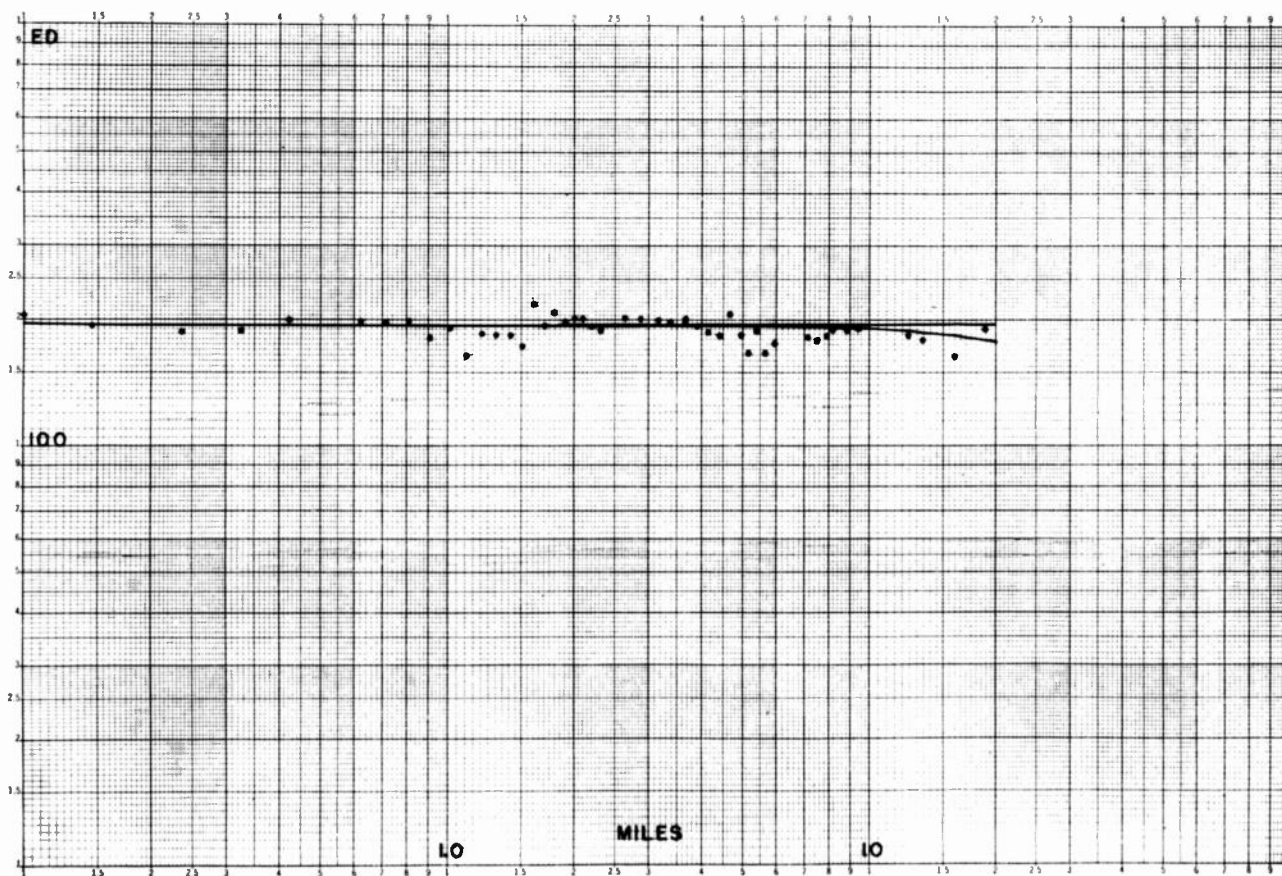
1000 PC 197.0

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1000 PC 198.0



THE HIGHWAY AREA
TAVAROUGH AREA
OCEAN BEACH

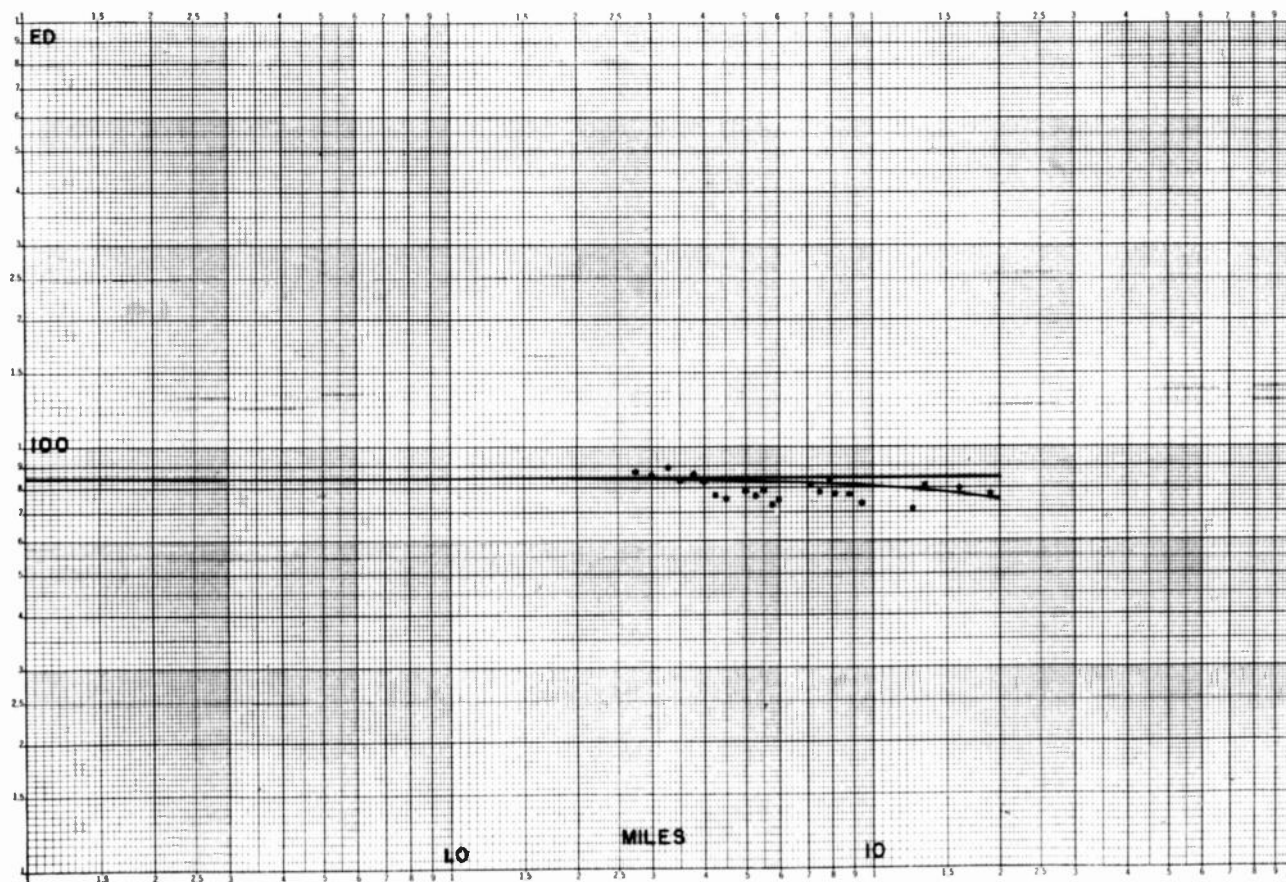


A. EARL CULLUM, JR.
CONSULTING RADIO ENGINEER
HIGHLAND PARK VILLAGE
DALLAS, TEXAS

RADIO STATION KWFT
620 KC - 1000 WATTS-NOM-DA
RADIAL NORTH 20C.0 DEGREES EAST
SEPT. 27, 28, 29 & OCT. 1, 1940

P	TIME	E	D	ED	COMMENTS
1H	8:30 AM	2055.	0.100	205	
2H	8:39 AM	1340.	0.145	194	
3H	8:44 AM	794.	0.235	186	
4H	8:49 AM	583.	0.325	189	
5H	8:57 AM	476.	0.420	200	
6H	9:00 AM	320.	0.520	198	WICHITA RIVER
7H	9:12 AM	276.	0.620	197	BLUFF
8H	9:15 AM	244.	0.810	198	
9H	9:42 AM	198.	0.910	180	BLUFF
10H	9:52 AM	189.	1.010	191	
11H	9:58 AM	148.	1.110	164	POINTS 12H TO 16H
12H	10:05 AM	153.	1.210	185	LOCATED IN SWAMPS,
13H	10:13 AM	141.	1.305	184	CREEK BOTTOMS, AND
14H	10:16 AM	130.	1.405	183	OLD RIVER CHANNELS.
15H	10:26 AM	115.	1.505	173	
16H	10:32 AM	136.	1.605	218	BLUFF
17H	10:35 AM	114.	1.700	194	
18H	10:42 AM	116.	1.800	208	
19H	10:50 AM	106.	1.900	199	
20H	10:55 AM	101.	2.00	202	
21H	11:00 AM	96.0	2.10	202	
22H	11:07 AM	87.9	2.20	193	
23H	11:11 AM	82.2	2.30	189	
24H	11:30 AM	77.4	2.40	187	INACCESSIBLE
25H	8:30 AM**	77.4	2.65	202	
26H	8:45 AM**	68.2	2.90	201	
27H	9:05 AM**	63.2	3.15	199	
28H	9:11 AM**	58.5	3.40	199	
29H	9:21 AM**	54.7	3.65	200	
30H	9:31 AM**	49.7	3.90	194	
31H	9:58 AM**	45.0	4.15	187	
32H	10:20 AM**	41.7	4.40	184	
33H	10:28 AM**	44.3	4.65	206	
34H	10:35 AM**	37.4	4.90	183	
35H	10:41 AM**	32.3	5.15	166	
36H	10:56 AM**	34.8	5.40	188	
37H	11:14 AM**	28.6	5.65	167	
38H	11:30 AM**	29.8	5.90	176	LAKE WICHITA
39H	1:44 PM***	25.3	7.15	181	LAKE WICHITA
40H	1:54 PM***	23.7	7.55	179	
41H	2:03 PM***	23.3	7.90	184	CREEK BOTTOM
42H	2:14 PM***	23.1	8.15	190	
43H	2:20 PM***	21.2	8.85	188	
44H	2:24 PM***	20.2	9.40	190	
45H	2:40 PM***	14.8	12.40	184	
46H	2:45 PM***	13.5	13.30	180	
47H	3:03 PM***	10.2	16.00	163	
48H	3:19 PM***	10.1	18.85	190	LITTLE WICHITA RIVER

EXHIBIT 4J

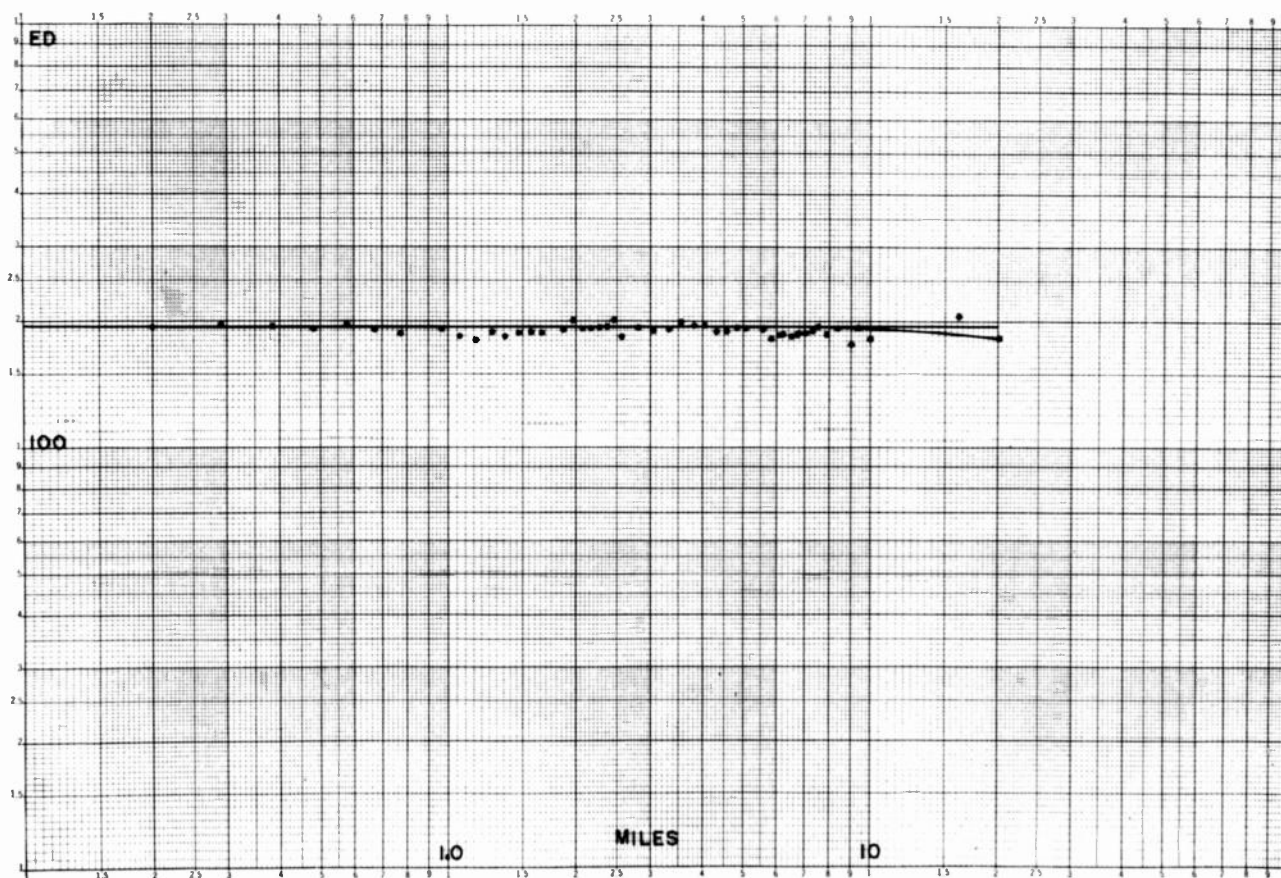


A. EARL CULLUM, JR.
CONSULTING RADIO ENGINEER
HIGHLAND PARK VILLAGE
DALLAS, TEXAS

RADIO STATION, WFT
C/O P.C. - 1000 WATTS-3A
RADIAL NORTH 111 DEGREES EAST
OCTOBER 2*, 10** AND 11, 1940

F	TIME	E	D	ED	COMMENTS
16H	0800 AM	21.2	2.78	87.7	
17H	0807 AM	23.3	3.30	86.6	
18H	0810 AM	27.0	3.20	81.7	
19H	0816 AM	23.7	3.80	83.0	
20H	0820 AM	20.1	3.75	86.3	
21H	0825 AM	20.7	4.00	82.8	
22H	1000 AM	16.1	4.00	76.0	
23H	1015 AM	16.6	4.50	75.1	
24H	1015 AM	17.7	4.75	84.0	
25H	1020 AM	15.7	5.30	78.5	
26H	1020 AM	14.0	5.20	70.0	
27H	1025 AM	14.0	5.80	78.0	
28H	1027 AM	12.0	5.75	72.5	
29H	1100 AM	12.6	6.0	75.0	LAKE WICHITA
30H	0800 PM	11.4	7.15	81.5	LAKE WICHITA
31H	0801 PM	10.5	7.25	79.2	
32H	0805 PM	10.0	7.0	83.8	CREEK BOTTOM
33H	0807 PM	9.50	8.15	77.8	
34H	0810 PM	8.70	6.30	77.0	
35H	1000 AM	7.88	5.20	74.0	
36H	1010 AM	5.70	12.50	71.0	
37H	1015 AM	6.11	13.50	81.4	
38H	1107 AM	4.00	16.00	71.5	
39H	1120 AM	4.00	18.00	70.0	LITTLE WICHITA RIVER

EXHIBIT 4K

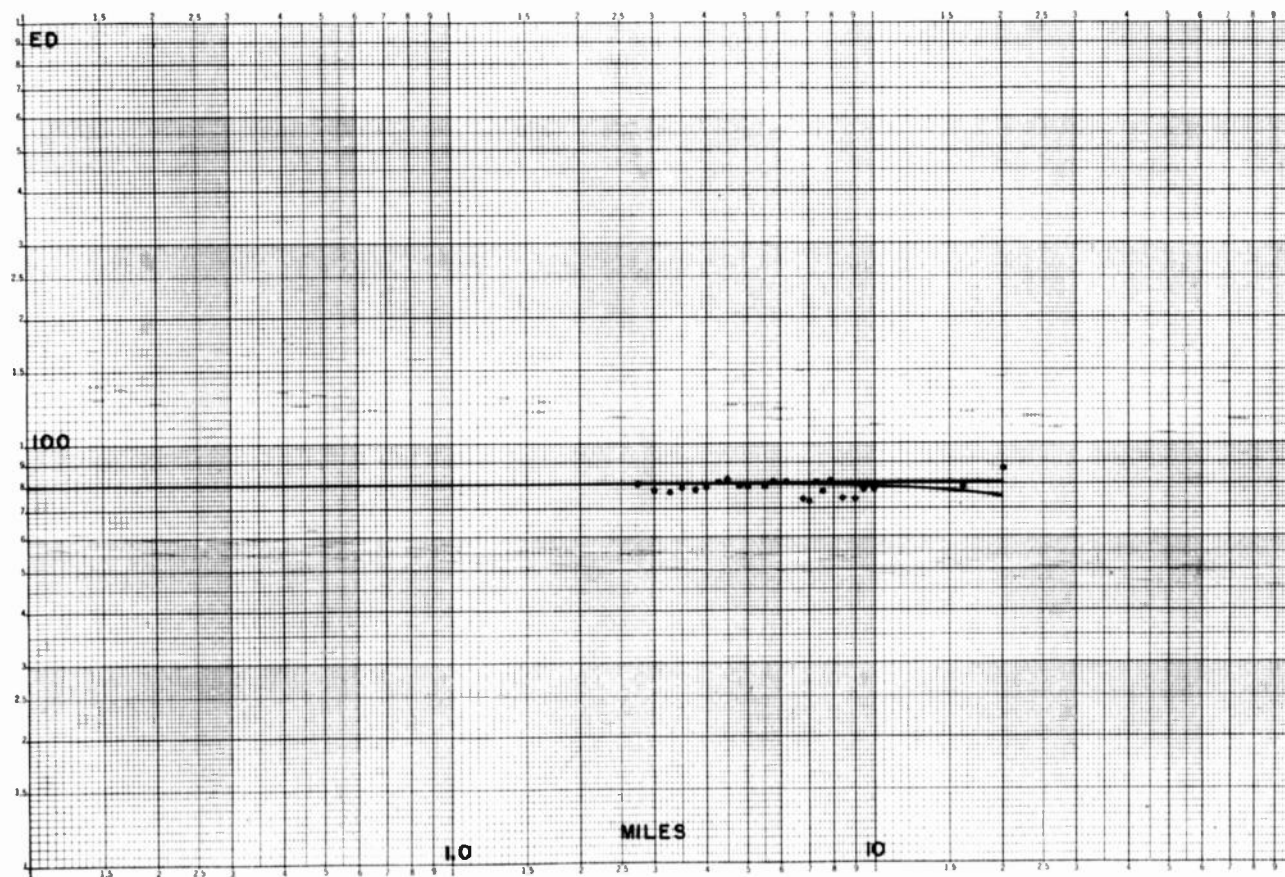


A. EARL CULLUM, JR.
CONSULTING RADIO ENGINEER
HIGHLAND PARK VILLAGE
DALLAS, TEXAS

RADIO STATION KWFT
620 KC - 1000 WATTS-NON-DA
RADIAL NORTH 272.0 DEGREES EAST
SEPTEMBER 26, 29, AND 30, 1940

P	TIME	E	D	ED	COMMENTS
1J	1:58 PM	970.	0.200	194	
2J	2:11 PM	675.	0.290	196	ON BLUFF
3J	2:18 PM	506.	0.385	195	
4J	2:29 PM	400.	0.480	192	BOTTOMS
5J	2:39 PM	342.	0.577	197	SWAMP
6J	2:45 PM	285.	0.675	192	
7J	2:50 PM	242.	0.773	187	ON BLUFF
8J					
9J	3:06 PM	197.	0.870	191	INACCESSIBLE
10J	3:20 PM	173.	1.070	185	ON BLUFF
11J	3:29 PM	158.	1.170	185	POINTS 10J TO 49J
12J	3:33 PM	149.	1.265	189	ON HIGH LEVEL PLAINS.
13J	3:40 PM	135.	1.365	184	
14J	3:44 PM	127.	1.465	186	
15J	3:47 PM	120.	1.565	188	
16J	3:52 PM	113.	1.660	188	
17J					
18J	4:10 PM	103.	1.860	191	LINES
19J	4:15 PM	103.	1.960	202	
20J	4:20 PM	93.5	2.060	193	
21J	4:26 PM	89.6	2.160	198	
22J	4:40 PM	85.5	2.260	193	
23J	4:45 PM	82.7	2.360	195	
24J	5:00 PM	82.3	2.460	202	
25J	5:05 PM	72.0	2.560	184	LINES 100 FT. WEST
26J	10:13 AM**	69.0	2.81	194	
27J	10:20 AM**	62.2	3.06	190	
28J	10:28 AM**	57.3	3.31	192	
29J	10:38 AM**	56.1	3.56	200	
30J	10:50 AM**	51.1	3.81	195	
31J	11:08 AM**	48.1	4.06	196	
32J	11:15 AM**	43.8	4.31	189	
33J	11:36 AM**	41.7	4.56	190	
34J	11:49 AM**	40.4	4.81	194	
35J	12:47 PM**	38.0	5.06	192	
36J					
37J	12:58 PM**	34.5	5.56	192	LINES
38J	1:12 PM**	31.1	5.81	181	
39J	1:25 PM**	30.5	6.06	185	
40J	9:27 AM*	30.1	6.20	186	
41J	9:42 AM*	28.4	6.50	185	
42J	9:48 AM*	27.6	6.70	185	
43J	10:12 AM*	27.2	6.80	185	
44J	10:20 AM*	26.6	7.05	188	
45J	10:26 AM*	26.0	7.30	190	
46J	10:40 AM*	25.5	7.55	195	
47J	10:53 AM*	23.6	7.90	186	
48J	10:58 AM*	22.9	8.40	193	
49J	11:38 AM*	19.5	9.00	176	
50J	11:16 AM*	20.6	9.35	193	
51J	11:23 AM*	18.1	10.0	181	POINTS 51, 52 & 53
52J	11:48 AM*	12.8	16.1	206	IN BADLY ERODED AREA
53J	12:16 PM*	5.18	20.1	184	

EXHIBIT 4M

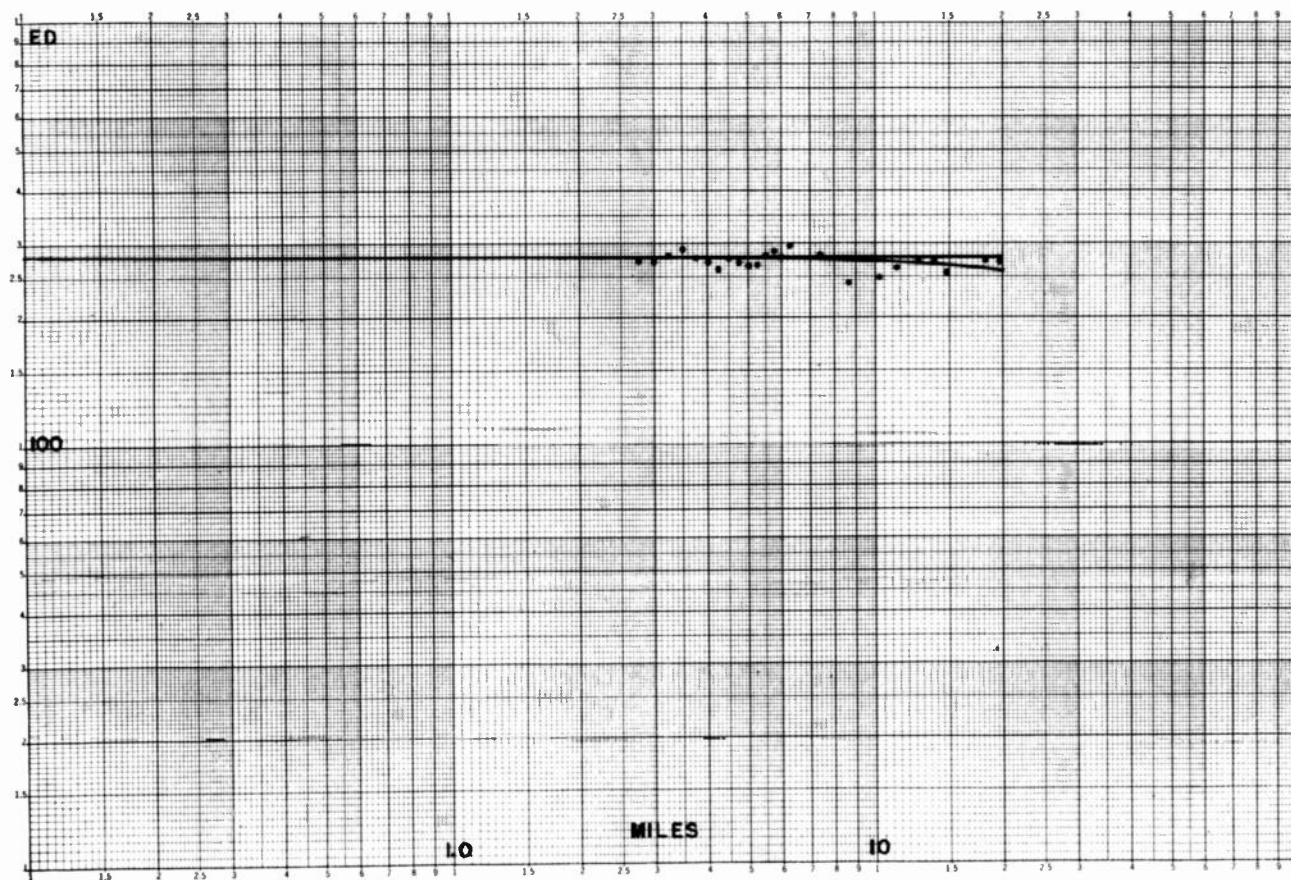


A. EARL CULLUM, JR.
CONSULTING RADIO ENGINEER
HIGHLAND PARK VILLAGE
DALLAS, TEXAS

RADIO STATION KWFT
CLASS - 1000 WATTS-DA
AZIMUTH 172 DEGREES EAST
COTTER 10, 12 AND 15-1940

P	TIME	E	D	ED	COMMENTS
100	1:05 PM	10.2	1.75	90.0	
170	1:10 PM	10.8	1.70	77.6	
180	1:15 PM	10.8	1.65	74.1	
190	1:20 PM	10.8	1.60	70.8	
200	1:25 PM	10.8	1.55	70.0	
210	1:30 PM	10.3	1.50	70.0	
220	1:40 PM	10.1	1.45	81.2	
230	1:47 PM	10.4	1.50	80.6	
240	1:52 PM	10.8	1.75	72.8	
250	1:55 PM	10.8	1.70	70.1	
260	2:00 PM	10.8	1.65	68.5	
270	2:05 PM	10.4	1.60	72.3	LINES
280	2:10 PM	10.4	1.55	61.0	
290	2:15 PM	10.4	1.50	72.0	
300	2:20 PM	10.0	1.50	60.0	
310	2:25 PM	10.0	1.45	60.0	
320	2:30 PM	10.0	1.40	60.0	
330	2:35 PM	10.0	1.35	60.0	
340	2:40 PM	10.0	1.30	60.0	
350	2:45 PM	10.0	1.25	60.0	
360	2:50 PM	10.0	1.20	60.0	
370	2:55 PM	10.0	1.15	60.0	
380	3:00 PM	10.0	1.10	60.0	
390	3:05 PM	10.0	1.05	60.0	
400	3:10 PM	10.0	1.00	60.0	
410	3:15 PM	10.0	0.95	60.0	
420	3:20 PM	10.0	0.90	60.0	
430	3:25 PM	10.0	0.85	60.0	
440	3:30 PM	10.0	0.80	60.0	
450	3:35 PM	10.0	0.75	60.0	
460	3:40 PM	10.0	0.70	60.0	
470	3:45 PM	10.0	0.65	60.0	
480	3:50 PM	10.0	0.60	60.0	
490	3:55 PM	10.0	0.55	60.0	
500	4:00 PM	10.0	0.50	60.0	
510	4:05 PM	10.0	0.45	60.0	
520	4:10 PM	10.0	0.40	60.0	
530	4:15 PM	10.0	0.35	60.0	
540	4:20 PM	10.0	0.30	60.0	
550	4:25 PM	10.0	0.25	60.0	
560	4:30 PM	10.0	0.20	60.0	
570	4:35 PM	10.0	0.15	60.0	
580	4:40 PM	10.0	0.10	60.0	
590	4:45 PM	10.0	0.05	60.0	
600	4:50 PM	10.0	0.00	60.0	

EXHIBIT 4H

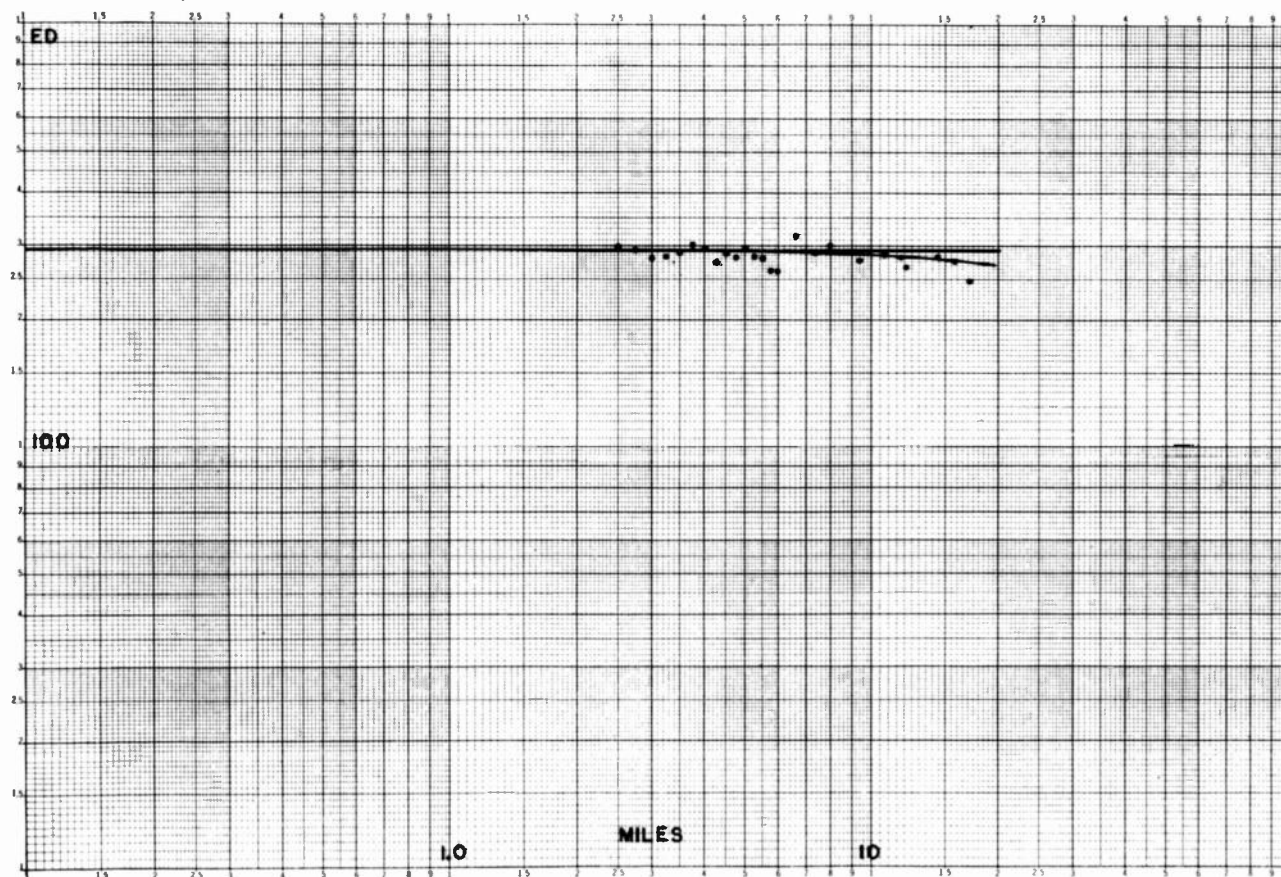


A. EARL CULLUM, JR.
CONSULTING RADIO ENGINEER
HIGHLAND PARK VILLAGE
DALLAS, TEXAS

RADIO STATION KFT
650 KC - 1000 WATTS-DA
ADIAL NORTH 90.5 DEGREES EAST
OCTOBER 19, 1940 AND 20, 1940

P	TIME	E	D	ED	COMMENTS
66K	2:50 PM	70.0	2.75	172	CREEK BOTTOM
67K	3:20 PM	60.5	3.00	172	
68K	3:40 PM	36.0	3.25	200	
69K	3:05 PM	30.0	3.50	289	HIGH ELEVATION
70K	3:48 PM	70.0	3.75	176	
71K	4:10 PM	67.4	4.00	170	
72K	4:30 PM	61.2	4.25	160	CREEK BOTTOM
73K	4:44 PM	61.1	4.50	170	
74K	4:58 PM	54.7	4.75	170	
75K	5:27 PM	55.8	5.00	164	
76K	5:06 PM	50.0	5.25	166	
77K	5:11 AM	51.0	5.50	180	
78K	5:15 AM	45.7	5.75	186	HIGH ELEVATION
79K	5:20 AM	45.7	6.00	174	HIGH ELEVATION
80K	1:37 PM	47.0	6.25	194	
81K	1:46 PM	38.1	7.50	180	
82K	1:56 PM	35.1	8.60	141	
83K	2:05 PM	24.0	10.15	150	
84K	2:10 PM	20.2	11.30	162	
85K	2:30 PM	22.0	12.60	177	
86K	2:47 PM	19.7	13.70	170	
87K	4:15 PM	17.1	14.80	153	
88K	4:27 PM	15.0	18.10	175	
89K	4:35 PM	12.0	19.70	174	

EXHIBIT 40



A. EARL CULLUM, JR.
CONSULTING RADIO ENGINEER
HIGHLAND PARK VILLAGE
DALLAS, TEXAS

RADIO STATION KEFT
610 KC - 1000 WATTS-DA
RADIAL NORTH 336.5 DEGREES EAST
OCTOBER 13 AND 10, 1940

P	TIME	E	D	ED	COMMENTS
66L	9:07 AM	119.0	2.50	458	LOW ELEVATION
66L	9:11 AM	107.0	2.75	404	
67L	10:05 AM	92.0	3.00	478	HIGH ELEVATION
67L	10:10 AM	86.0	3.25	482	
67L	10:11 AM	82.5	3.50	468	
66L	10:17 AM	76.0	3.75	362	
67L	10:18 AM	73.5	4.00	400	CREEK
66L	10:18 PM	64.5	4.25	274	CREEK
66L	10:20 PM	60.4	4.50	256	
66L	10:20 PM	58.9	4.75	200	
66L	10:20 PM	56.9	5.00	205	
66L	10:41 PM	54.1	5.25	234	
67L	10:40 PM	51.0	5.50	280	
66L	10:41 PM	45.0	5.75	242	
66L	10:00 PM	40.4	6.00	261	HIGH ELEVATION
66L	10:00 AM	43.4	6.00	210	HIGH ELEVATION
67L	10:00 AM	35.4	7.00	288	
66L	10:00 AM	27.7	7.25	300	
66L	10:00 AM	25.0	7.50	275	
66L	10:00 AM	24.8	10.65	286	
66L	10:17 AM	20.8	11.80	261	
66L	10:12 AM	21.9	12.20	268	
67L	10:10 AM	19.6	14.45	283	
66L	10:10 AM	17.5	15.00	276	
66L	10:10 AM	14.5	17.00	240	RED RIVER - BEHIND BLUFF

EXHIBIT 4P

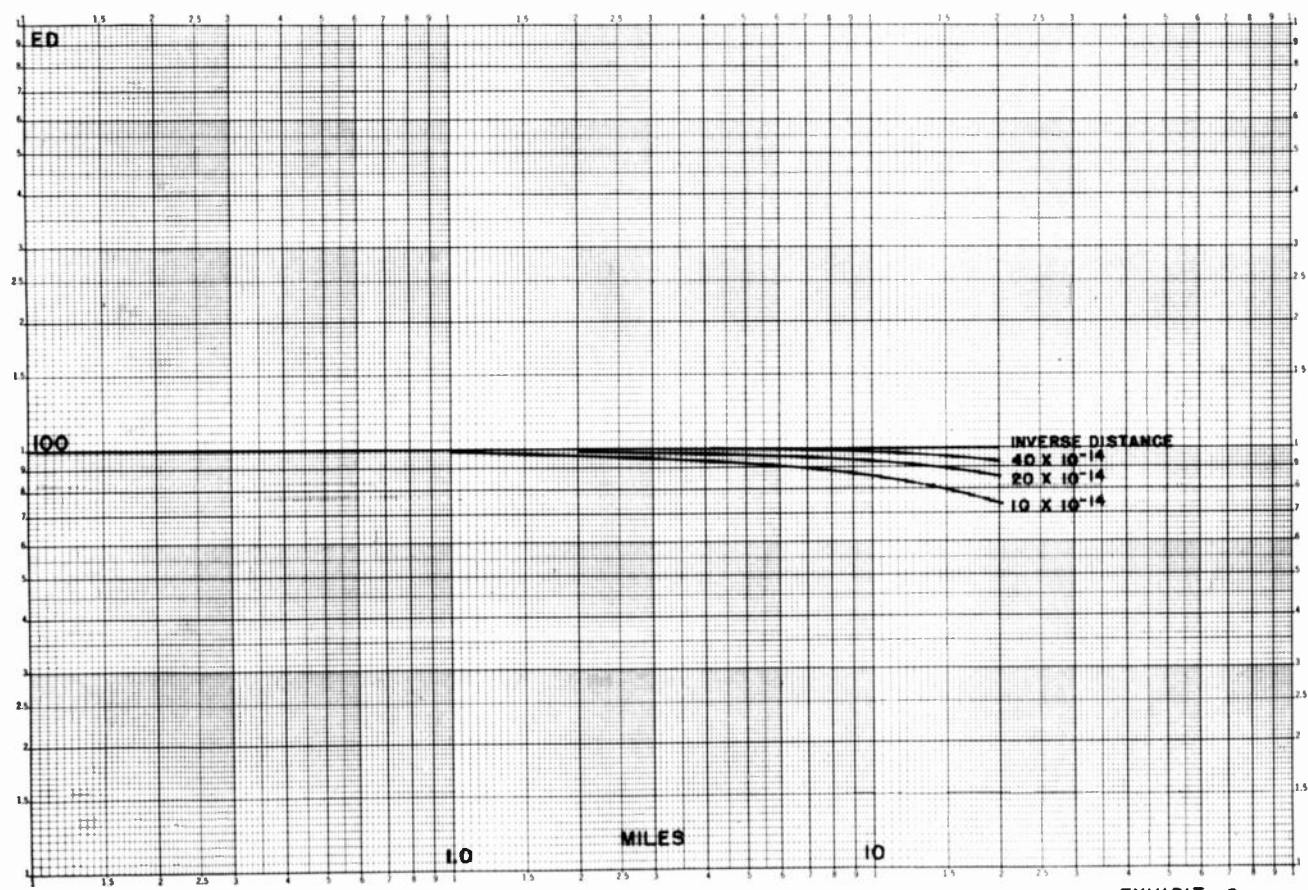


EXHIBIT 5

DESCRIPTION OF KWFT MONITORING POINTS

MILWAUKEE, WISCONSIN KWFT 29.4 MILLIVOLTS PER METER

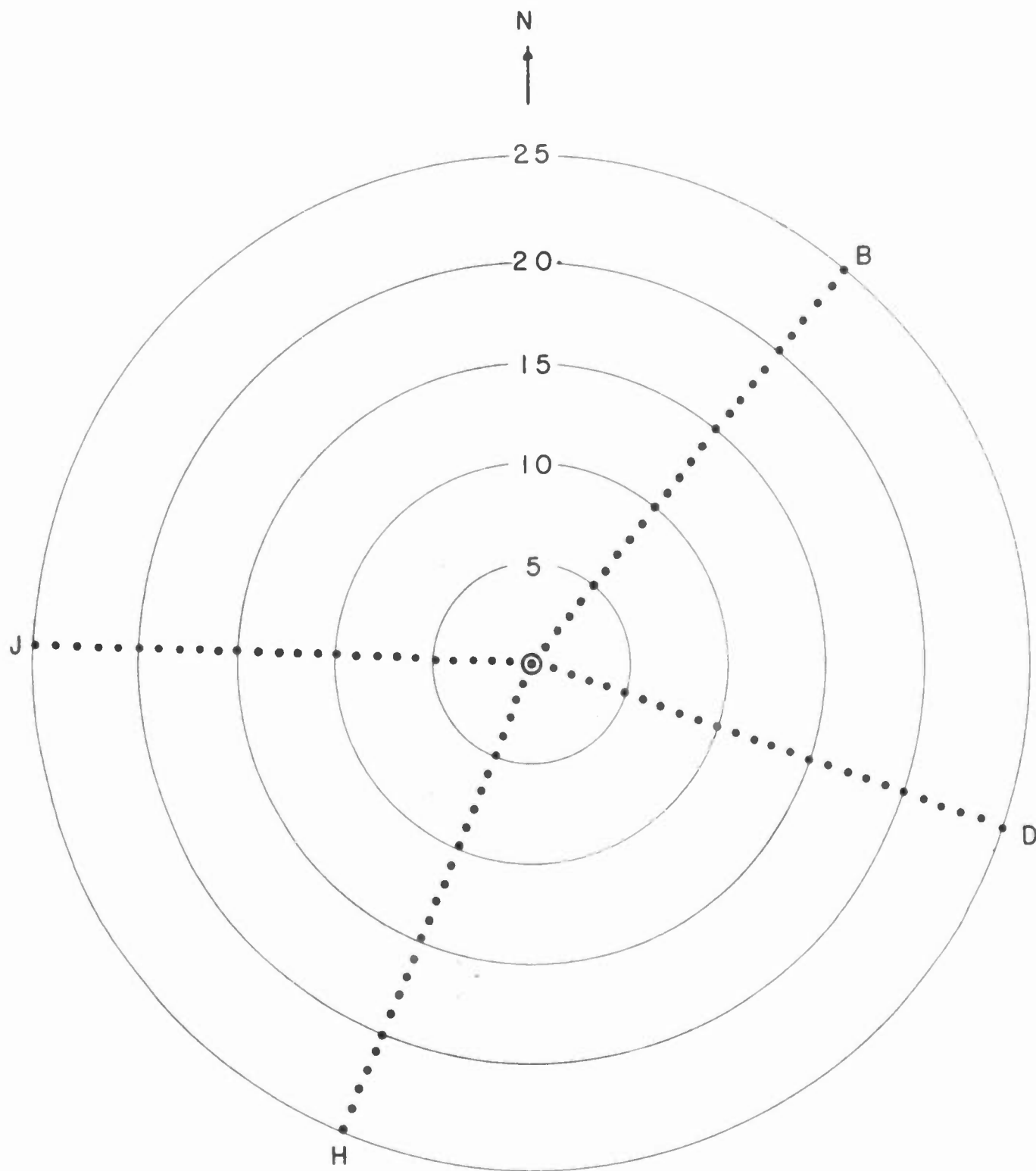
THIS POINT IS LOCATED 2.60 MILES IN THE DIRECTION NORTH 39.0 DEGREES EAST FROM THE MID POINT BETWEEN THE KWFT TOWERS. TO REACH THIS POINT PROCEED FROM THE WICHITA FALLS CITY LIMITS NORTHWEST ON U. S. HIGHWAY 70; 1.50 MILES TO JUNCTURE WITH GRAVEL ROAD RUNNING SOUTH; GO SOUTH 0.50 MILES TO JUNCTURE WITH GRAVEL ROAD TO THE WEST; TURN WEST ACROSS THE MISSOURI-KANSAS-TEXAS RAILROAD TRACKS, AND CONTINUE 0.40 MILES WEST FROM THE TRACKS TO THE MONITOR POINT.

TAMPA, FLORIDA WFLA-WSUN 19.7 MILLIVOLTS PER METER

THIS POINT IS LOCATED 4.25 MILES IN THE DIRECTION NORTH 109.0 DEGREES EAST FROM THE MID POINT BETWEEN THE KWFT TOWERS. TO REACH THIS POINT PROCEED 0.05 MILES EAST FROM THE WICHITA FALLS CITY LIMITS AND HOLLIDAY CREEK ON U. S. HIGHWAY 82; THE MONITOR POINT IS ON THE SOUTH SIDE OF THE HIGHWAY RIGHT-OF-WAY.

PHOENIX, ARIZONA KTAR 29.1 MILLIVOLTS PER METER

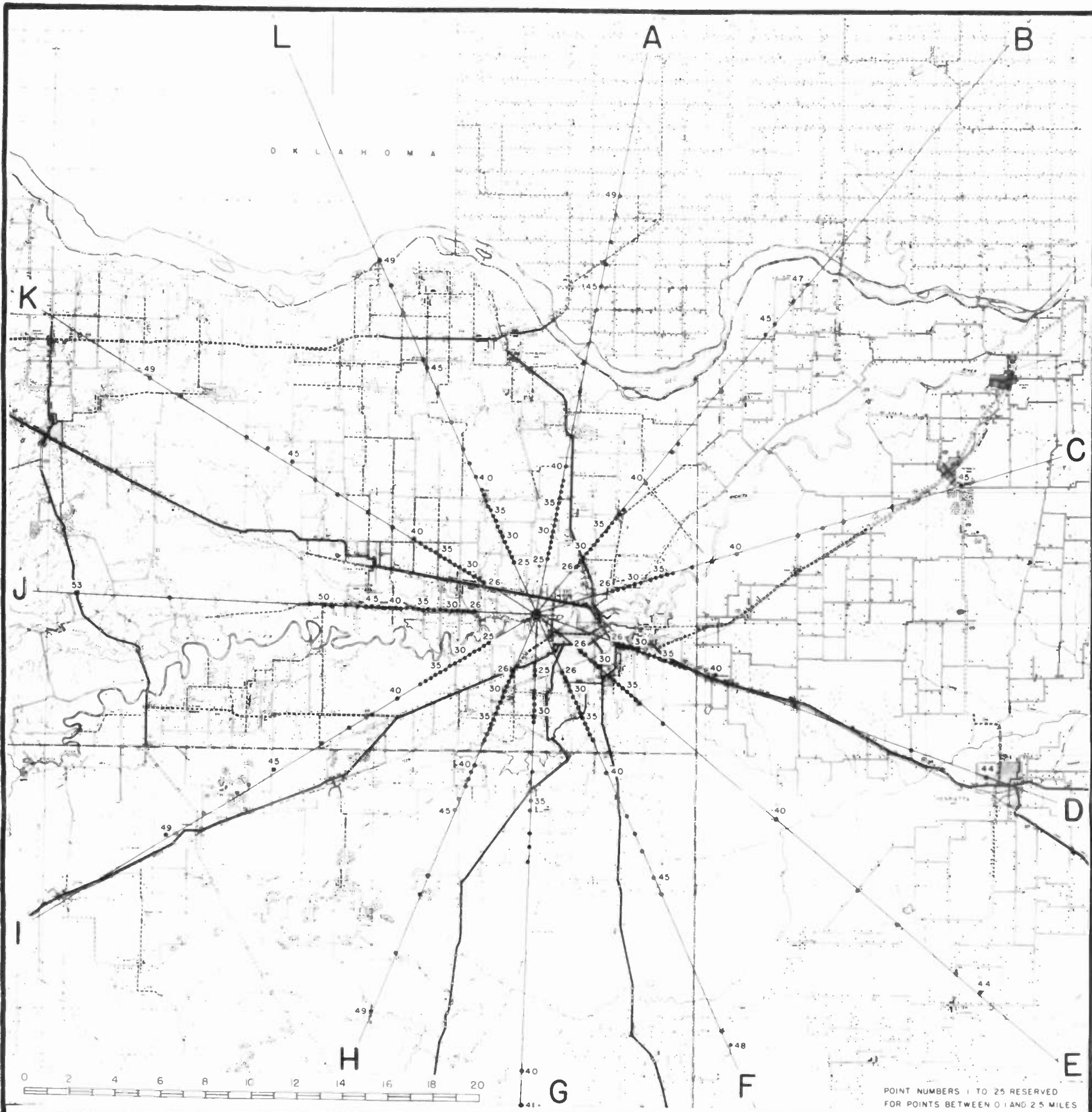
THIS POINT IS LOCATED 2.75 MILES IN THE DIRECTION NORTH 272.0 DEGREES EAST FROM THE MID POINT BETWEEN THE KWFT TOWERS. TO REACH THIS POINT PROCEED FROM THE KWFT PLANT APPROXIMATELY 3 MILES WEST ON THE INDIAN HEIGHTS ROAD TO CHASTE ROAD; TURN NORTH 0.40 MILES TO PRIVATE ENTRANCE TO FARM HOUSE ON THE WEST SIDE OF CHASTE ROAD; TURN WEST INTO FARM YARD AND PROCEED 0.20 MILES DUE WEST TO MONITOR POINT, WHICH IS LOCATED BY IRRIGATION CANAL.



NUMBER ASSIGNED TO EACH POINT INDICATES DISTANCE FROM ANTENNAE TO POINT MEASURED IN TENTH MILES

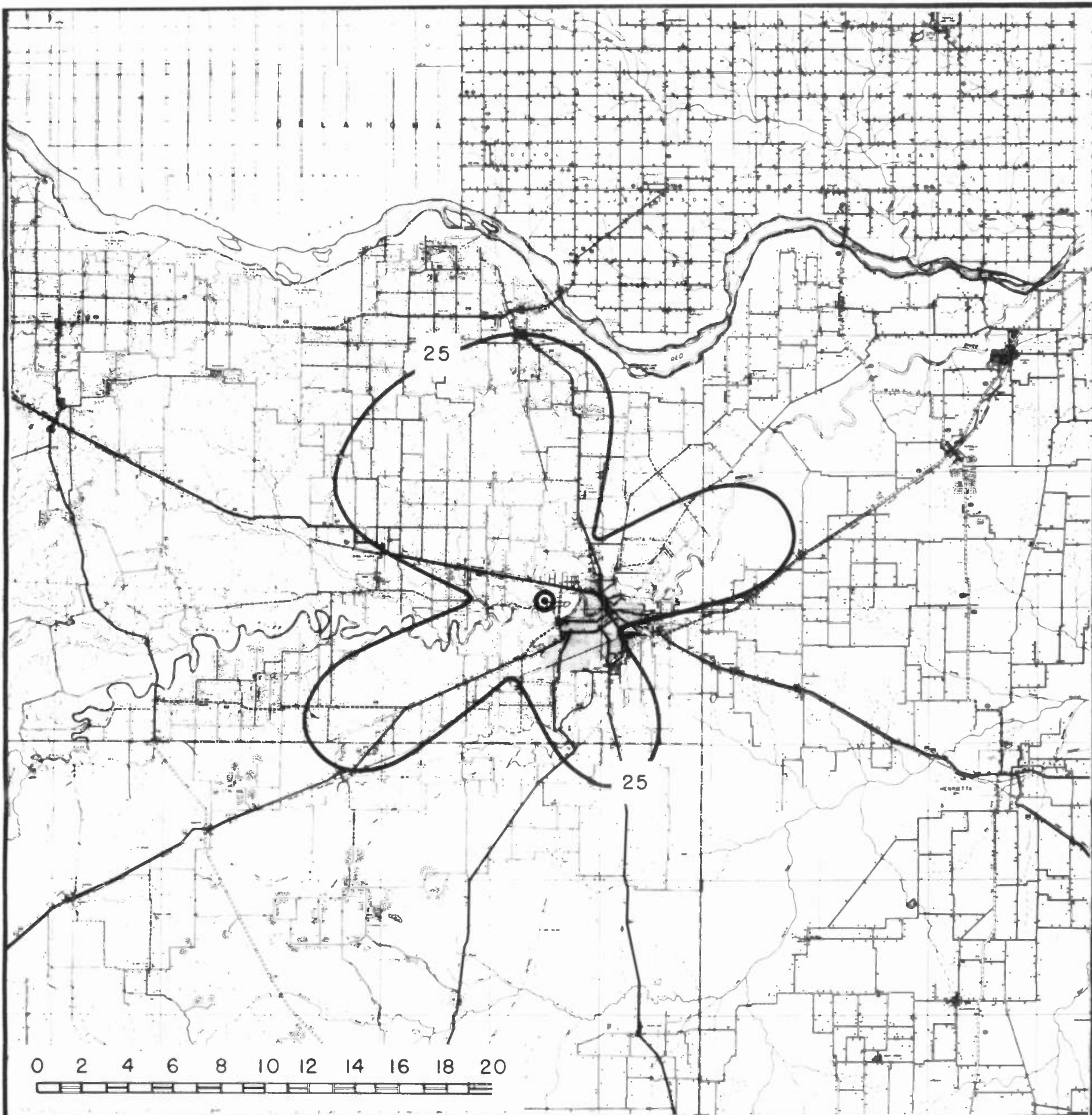
AREA IMMEDIATELY
SURROUNDING THE ANTENNA
A. EARL CULLUM, JR.
RADIO ENGINEERING CONSULTANT

RADIO STATION KWFT
620 KC. 5000-1000 WATTS-DA.
POINT LOCATION MAP
EXHIBIT NUMBER 7



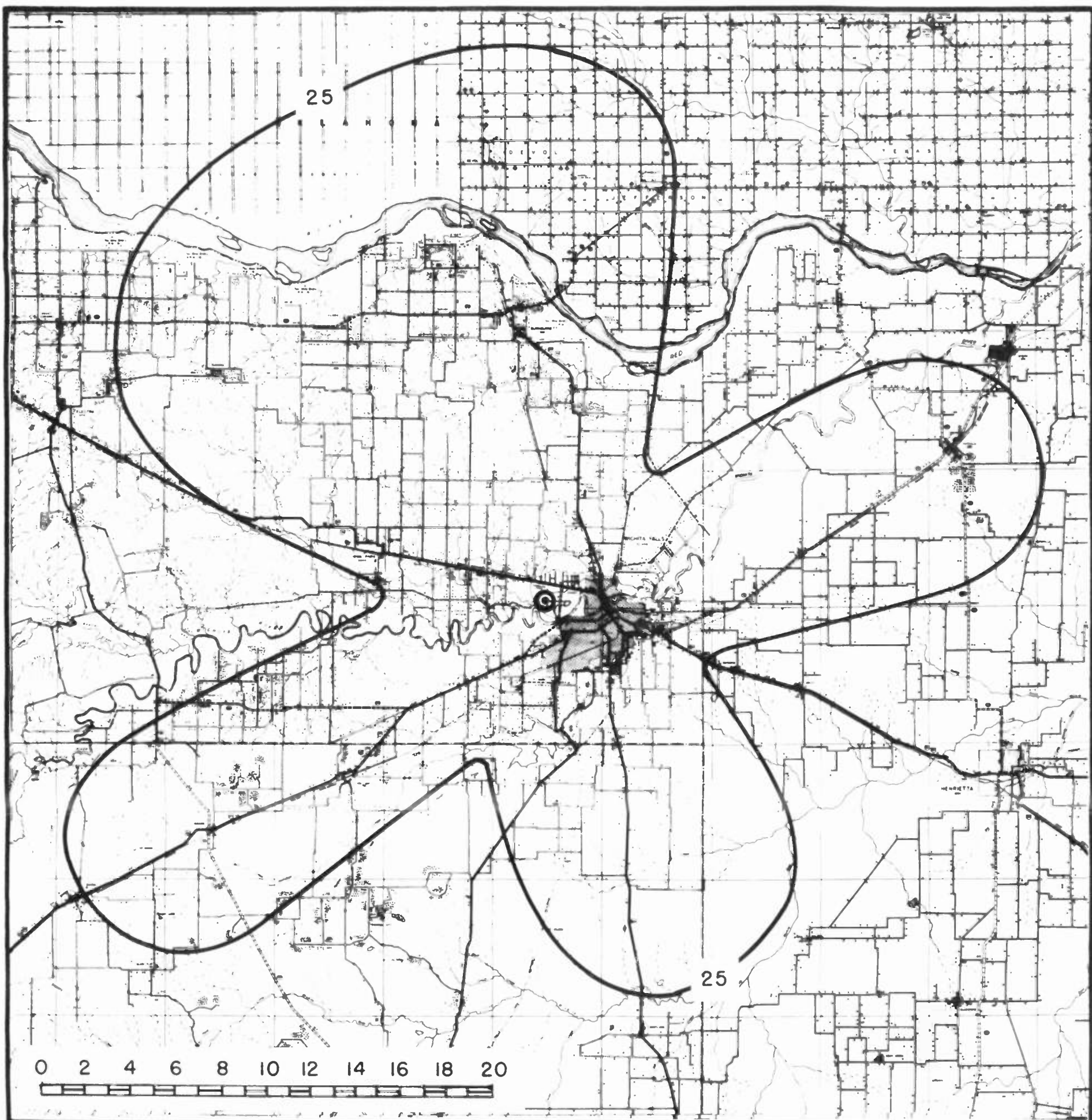
WICHITA FALLS, TEXAS
AND SURROUNDING TERRITORY
A. EARL CULLUM, JR.
RADIO ENGINEERING CONSULTANT

RADIO STATION KWFT
620 KC 5000-1000 WATTS-DA
POINT LOCATION MAP
EXHIBIT NUMBER 8



WICHITA FALLS, TEXAS
AND SURROUNDING TERRITORY
A. EARL CULLUM JR.
RADIO ENGINEERING CONSULTANT

RADIO STATION KWFT
620 KC. 1000 WATTS-DA
MEASURED CONTOUR
EXHIBIT NUMBER 9A



WICHITA FALLS, TEXAS
AND SURROUNDING TERRITORY
A. EARL CULLUM JR.
RADIO ENGINEERING CONSULTANT

RADIO STATION KWFT
620 KC. 5000 WATTS-DA
MEASURED CONTOUR
EXHIBIT NUMBER 9B

File No.

Call letters KWFT

UNITED STATES OF AMERICA
FEDERAL COMMUNICATIONS COMMISSION

APPLICATION TO DETERMINE OPERATING POWER OF BROADCASTING STATION
BY DIRECT MEASUREMENT OF ANTENNA POWER

(Submit in duplicate to Federal Communications Commission, Washington, D.C. Swear to one copy)

To the Federal Communications Commission:

1. Name of applicant* : WICHITA BROADCASTING COMPANY
2. Post office address: State TEXAS City WICHITA FALLS
Street and number 800 EIGHTH STREET
3. Existing license or construction permit authorizes the use of the following:
 - (a) Call letters KWFT (b) Frequency 620 KC
 - (c) Power: Night 1000 DA watts; Day 5000 DA watts.
4. Description of antenna system: DIRECTIONAL ANTENNA FOR DAY AND NIGHT
 - (a) Type 2 ELEMENT DIRECTIONAL Height of vertical lead 400 feet.
Length of flat top NONE feet. Height of top of antenna above ground level 405 feet. If not fully described above, give further details and dimensions:
LINE OF TOWER N 155.5 E, NORTH TOWER CURRENT 0.63 PHASED
PLUS 38 DEGREES, SOUTH TOWER CURRENT 1.00 PHASED 00 DEGREES.
 - (b) Is counterpoise used? NO If so, state: Type XXX
Length XXX feet. Breadth XXX feet.
Height above ground (earth) or roof XXX feet.
 - (c) Is ground used? YES If so, describe fully giving details and dimensions 120 RADIALS
EACH 400 FEET LONG AND 120 RADIALS EACH 60 FEET LONG EQUALLY
SPACED ABOUT EACH TOWER BURIED 6 TO 8 INCHES.
 - (d) Towers: Type and description LEHIGH SELF-SUPPORTING, SQUARE, TAPERED,
SERIES FED STEEL TOWERS Height 400 feet.
1398
Distance apart 1398 feet. Operated grounded or insulated? INSULATED

* Name must be identical with that used in existing license or construction permit.

STATE OF TEXAS)
) ss.
COUNTY OF DALLAS)

A. EARL CULLUM, JR., BEING DULY SWORN, DEPOSES AND SAYS THAT HE IS A QUALIFIED AND EXPERIENCED RADIO ENGINEER WITH OFFICES LOCATED IN DALLAS, TEXAS, AND THAT HE HAS BEEN ENGAGED BY THE LICENSEE OF RADIO STATION KWFT, THE WICHITA BROADCASTING COMPANY, WICHITA FALLS, TEXAS, TO TAKE MEASUREMENTS ON THE KWFT DIRECTIONAL ANTENNA SYSTEM TO BE FILED WITH AND MADE A PART OF AN APPLICATION TO DETERMINE THE OPERATING POWER OF THE KWFT DIRECTIONAL ANTENNA BY DIRECT MEASUREMENT OF POWER. THE ASSIGNMENT OF KWFT IS 620 KILOCYCLES, 5000 WATTS DAYTIME, 1000 WATTS NIGHTTIME, USING A DIRECTIONAL ANTENNA BOTH DAY AND NIGHT.

DEPONENT CERTIFIES THAT THE ENGINEERING DATA HERewith SUBMITTED, TOGETHER WITH ATTACHED EXHIBITS, WAS PREPARED BY HIM, AND THAT THE FACTS AND DATA CONTAINED HEREIN ARE TRUE AND ACCURATE TO THE BEST OF HIS KNOWLEDGE AND BELIEF.

A. EARL CULLUM, JR.

SUBSCRIBED AND SWORN TO BEFORE ME THIS 29TH DAY OF OCTOBER, 1940.

NOTARY PUBLIC IN AND FOR
DALLAS COUNTY, TEXAS

MY COMMISSION EXPIRES JUNE 1, 1941.

(A) QUALIFICATIONS OF ENGINEERS TAKING THESE MEASUREMENTS

MR. A. EARL CULLUM, JR., ENGINEER TAKING THESE MEASUREMENTS IS A CONSULTING ENGINEER WITH OFFICES IN HIGHLAND PARK VILLAGE, DALLAS, TEXAS. HE GRADUATED FROM THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY IN 1931, RECEIVING A BACHELOR OF SCIENCE DEGREE IN COMMUNICATION ENGINEERING. MR. CULLUM HAS BEEN EMPLOYED ALMOST CONTINUOUSLY AS A MEMBER OF BROADCAST STATION ENGINEERING STAFFS SINCE 1922. SINCE JULY, 1936, HE HAS MAINTAINED AN OFFICE AS A CONSULTING ENGINEER. LABORATORY AND FIELD WORK HAS REQUIRED THAT HE BE QUALIFIED TO TAKE RADIO FREQUENCY MEASUREMENTS.

(B) FULL DESCRIPTION OF METHOD USED TO MAKE MEASUREMENTS

THE DIRECTIVE ANTENNA POWER DIVIDING AND PHASING NETWORK, WHEN LOADED WITH THE DIRECTIVE ANTENNA, WAS MEASURED WITH A RADIO FREQUENCY BRIDGE USING THE PARALLEL STANDARDS METHOD IN THE FOLLOWING MANNER: A SIGNAL GENERATOR PRODUCING EACH DESIRED FREQUENCY WAS CONNECTED ACROSS THE "GENERATOR" TERMINALS OF THE BRIDGE. THE FREQUENCY OF THE SIGNAL GENERATOR WAS ADJUSTED BY BEATING THE GENERATOR AGAINST AN ACCURATELY CALIBRATED OSCILLATOR. THE CALIBRATION OF THE OSCILLATOR WAS CHECKED AGAINST KNOWN BROADCAST STATION CARRIER FREQUENCIES. A RADIO RECEIVER WAS USED AS A NULL-INDICATOR ACROSS THE "DETECTOR" TERMINALS OF THE BRIDGE. THE CALIBRATION OF THE BRIDGE WAS FIRST CHECKED BY PLACING KNOWN STANDARDS IN PARALLEL ACROSS THE "UNKNOWN" TERMINALS OF THE BRIDGE. THE NETWORK WAS THEN CONNECTED IN PARALLEL WITH SUITABLE KNOWN STANDARDS ACROSS THE "UNKNOWN" TERMINALS OF THE BRIDGE. THE BRIDGE READINGS WERE RECORDED FOR EACH CONDITION OF BALANCE. THE ACTUAL VALUE OF THE NETWORK IMPEDANCE AT EACH FREQUENCY WAS THEN CALCULATED FROM THE DATA RECORDED.

(C) MANUFACTURER'S NAME AND RATED ACCURACY OF EACH CALIBRATED INSTRUMENT.

<u>INSTRUMENT</u>	<u>MANUFACTURER</u>	<u>RATED ACCURACY</u>
RADIO FREQUENCY BRIDGE TYPE 516C SERIAL 342	GENERAL RADIO Co.	2%
RADIO FREQUENCY GENERATOR	A. E. CULLUM, JR.	0.05%
RADIO RECEIVER TYPE HRO	NATIONAL COMPANY	NULL INDICATOR

(D) DATE, ACCURACY, AND BY WHOM EACH INSTRUMENT WAS LAST CALIBRATED.

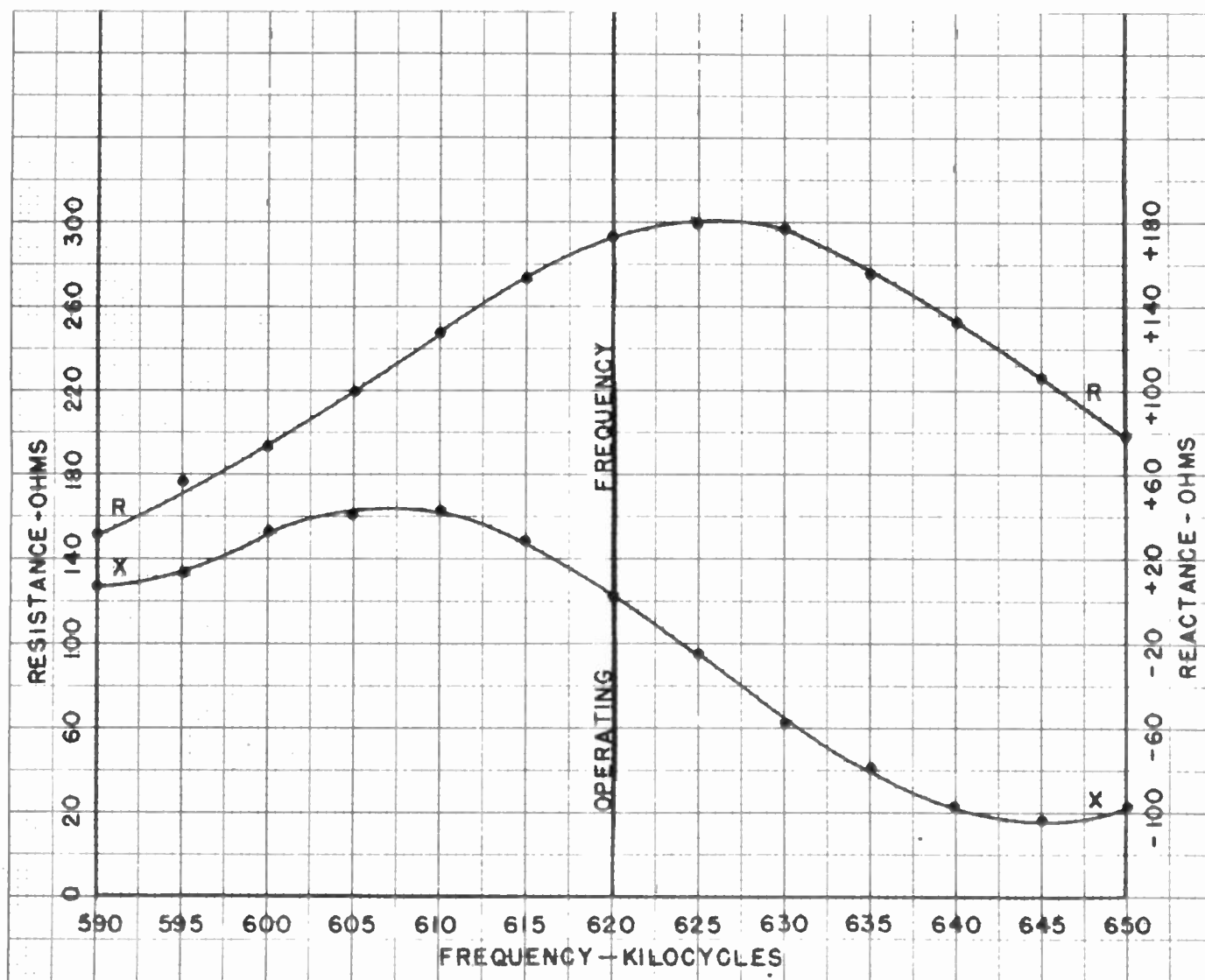
<u>INSTRUMENT CALIBRATED</u>	<u>DATE</u>	<u>ACCURACY</u>	<u>BY WHOM</u>
RADIO FREQUENCY BRIDGE TYPE 516C SERIAL 342	OCT. 11, 1940	2%	A.E. CULLUM, JR.
RADIO FREQUENCY GENERATOR	OCT. 11, 1940	0.05%	A.E. CULLUM, JR.

(E)

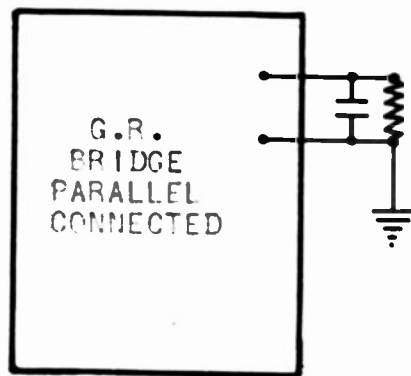
DIRECTIVE ANTENNA COMMON POINT IMPEDANCE
 RADIO STATION KWFT, WICHITA FALLS, TEXAS
 A. EARL CULLUM, JR. CONSULTING ENGINEER
 OCTOBER 11, 1940

FREQUENCY KILOCYCLES	PARALLEL R ₁	STDS. C ₁	STDS. & NET. R ₂	PAR. C ₂	NETWORK R	IMPEDANCE X
590	100.2	448	60.1	526	151	+6.9
595	100.2	448	62.9	330	167	+13.0
600	100.2	448	66.5	229	193	+32.8
605	100.2	447	69.6	233	218	+41.0
610	100.2	448	72.0	275	248	+42.5
615	100.2	447	73.8	352	273	+28.2
620	100.2	447	74.8	438	292	+3.0
625	100.2	447	75.5	514	299	-24.2
630	100.2	447	75.6	609	296	-58.3
635	100.3	448	75.4	696	276	-79.5
640	100.3	448	74.5	787	253	-96.8
645	100.3	448	73.1	880	226	-104.0
650	100.3	448	71.2	964	198	-98.5

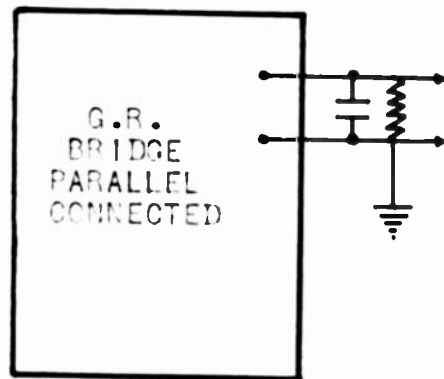
MEASUREMENTS BY USE OF PARALLEL STANDARDS



(1) COMMON POINT IMPEDANCE MEASUREMENTS



AT ALL FREQUENCIES
READ R_1 AND C_1



COMMON
POINT

AT ALL FREQUENCIES
READ R_2 AND C_2

COMMON POINT IMPEDANCE:

$$R = \frac{G_x}{G_x^2 + B_x^2}$$

$$X = \frac{-B_x}{G_x^2 + B_x^2}$$

WHERE

$$G_x = \frac{1}{R_2} - \frac{1}{R_1}$$

$$B_x = \omega(C_2 - C_1)$$

AUDIO FIDELITY CURVE

± 75 KC SWING

GR FM MONITOR 1170-A

---- Standard 75 μ sec Pre Emphasis Curve

— Overall Equipment Response Curve

DECIBELS

+ 18

+ 16

+ 14

+ 12

+ 10

+ 8

+ 6

+ 4

+ 2

+ 0

- 2

50

100

400

1000

5000

10000

15000

CYCLES PER SECOND

