

EDWARDS AND MARTIN

Consulting Ingineers

DETROIT, MICHIGAN

This firm on February 28, 29 and March 1, 1936 made graphic recordings of field intensity during the night-time period from stations W O W, Omaha, and X E P N, Piedras Negras, Mexico, in the Kalamazoo, Michigan, area.

These recordings were made with a view to determining the amount of night-time signal these stations lay down in the Kalamazoo area

The equipment was set up at Grand Pre Avenue and Deney St in Kalamazoo. The first night, February 28th, recordings were started at 8:31 pm E. S. T., and concluded at 10:26:30 pm. During this period the recorder was adjusted to station W O W. For the first hour of recording the maximum signal ten percent of the time was less than 40 microvolts. From 9:30 to 10:26 pm the signal increased so that the maximum signal ten percent of the time was 160 microvolts. A slight beat was present on the channel and "monkey chatter" from station X E P N was noted.

On the second night, February 29th, recording was started on station W O W at 10:40 pm E. S. T. At 10:50 pm the recorder was adjusted to station X E P N who was transmitting at a frequency approximately 5 kilocycles below station W O W. Every fifteen mimutes for a two hour period the recorder was alternately adjusted to W O W and X E P N. As shown on the graphic record for this time and date there was a strong beat on W O W's frequency. A short section of the graphic record, running at rapid feed, shows this beat to be approximately 4 cycles. At 1:00 am station W E E I, Boston, was indentified. When W E E I signed off the beat stopped and the signal on the channel dropped from an average value of 285 microvolts to 190 microvolts. The modulation of W E E I was ordinarily completely blanketed by that from station W O W.

During the one hour in which station X E P N was recorded the

maximum signal ten percent of the time was 150 microvolts. During the one hour and twenty-eight mimutes that W O W was recorded the maximum signal ten percent of the time was 450 microvolts. During the short period that W O W was recorded after W E E I signed off the maximum signal ten percent of the time was 175 microvolts.

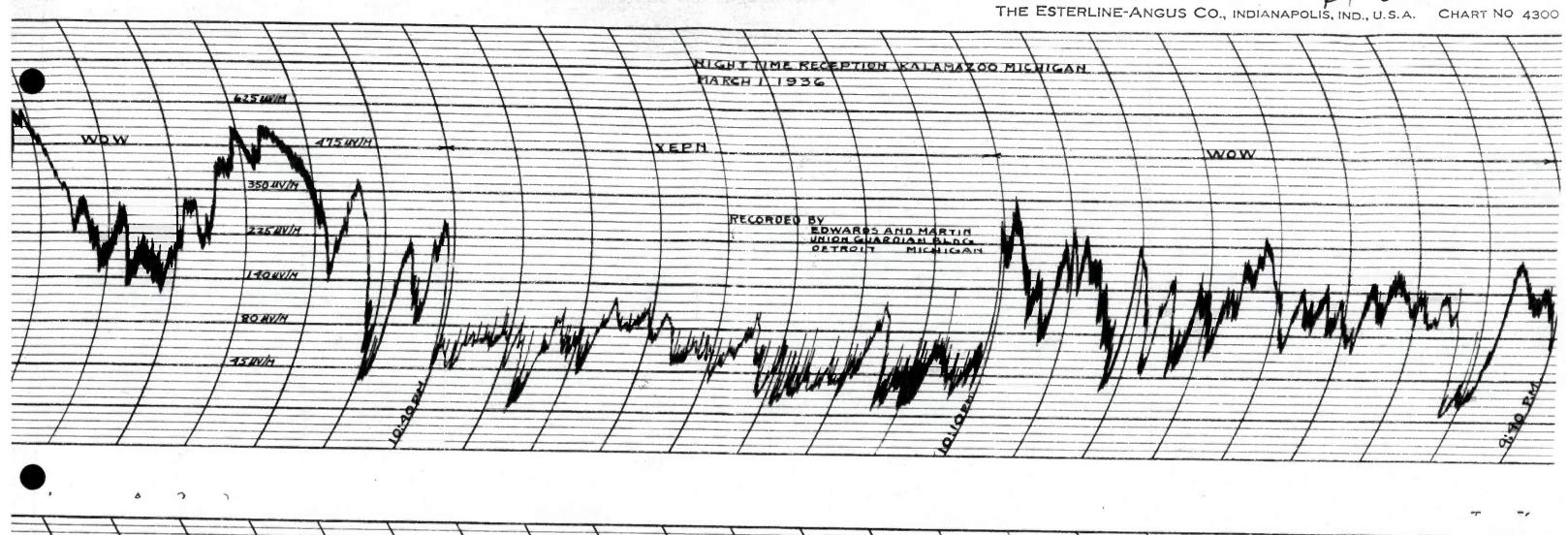
At the conclusion of the recording of W 0 W the recorder was adjusted to station X E P N for approximately two minutes and during this time the signal from this station reached a value of 140 microvolts.

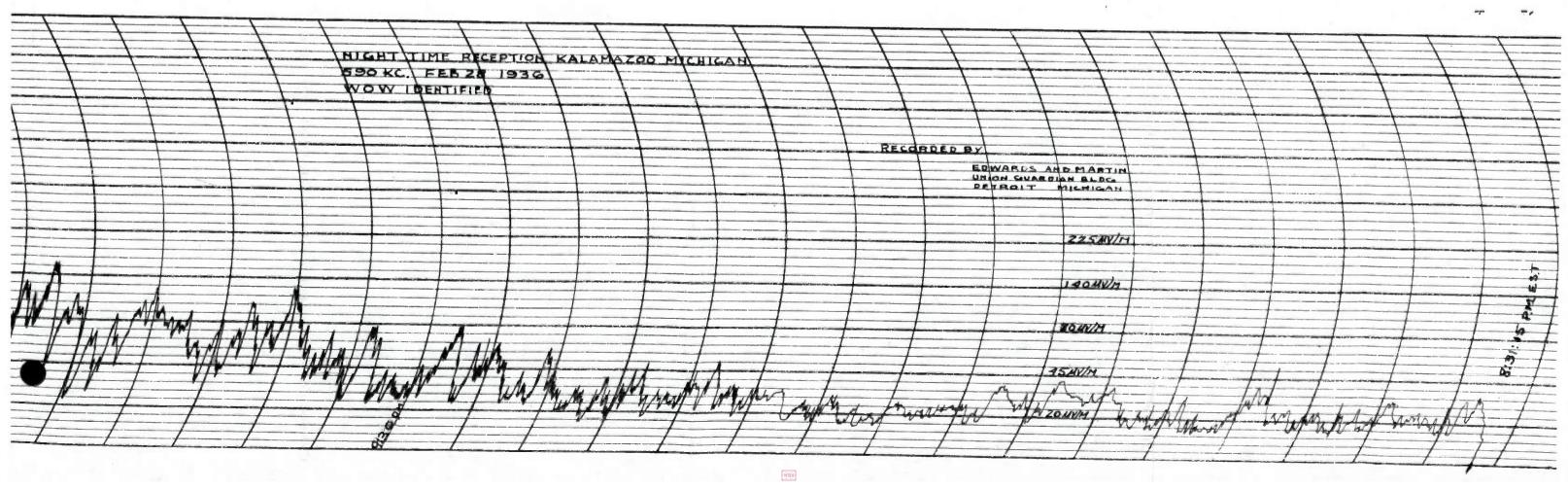
On March 1st recording was started, at the same location as on previous nights, at 9:40 pm. On this night the recorder was first adjusted to W O W for one-half hour and then alternately adjusted to station X E P N and W O W at half hour periods. The recording was concluded at 11:40 pm E. S. T.

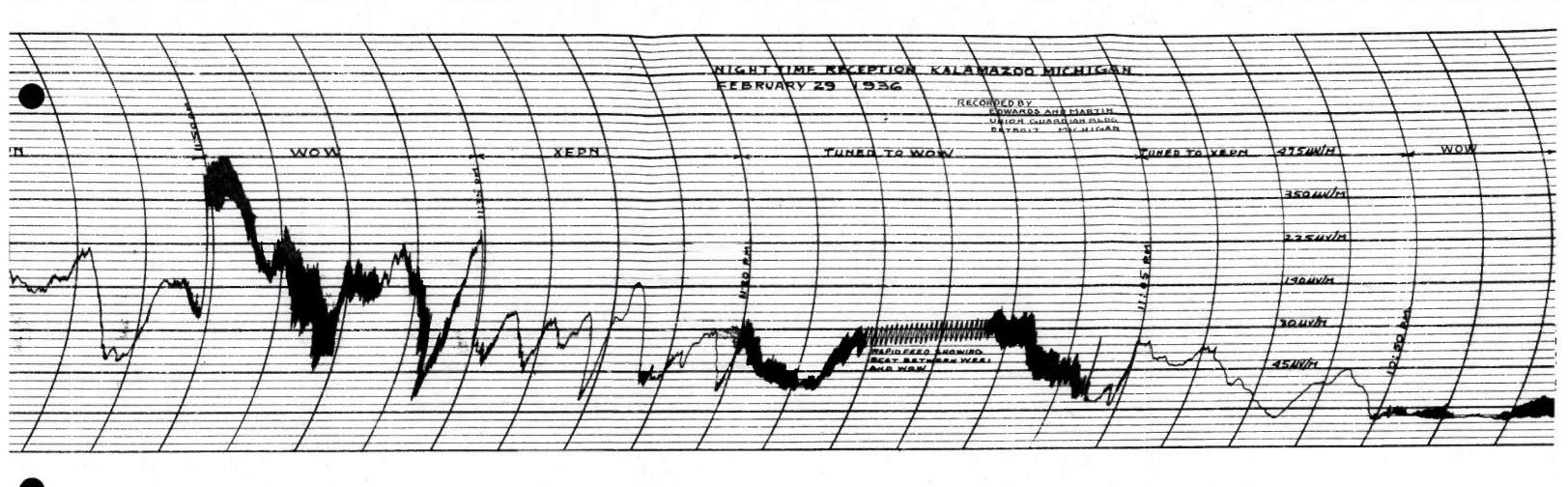
During the two and one half hour period in which W O W was recorded the maximum signal ten percent of the time was 425 microvolts. As on previous nights there was a strong beat on this channel as shown by the graphic record but at no time was there audible flutter of W O W modulation. Some side band interference was noted from X E P N.

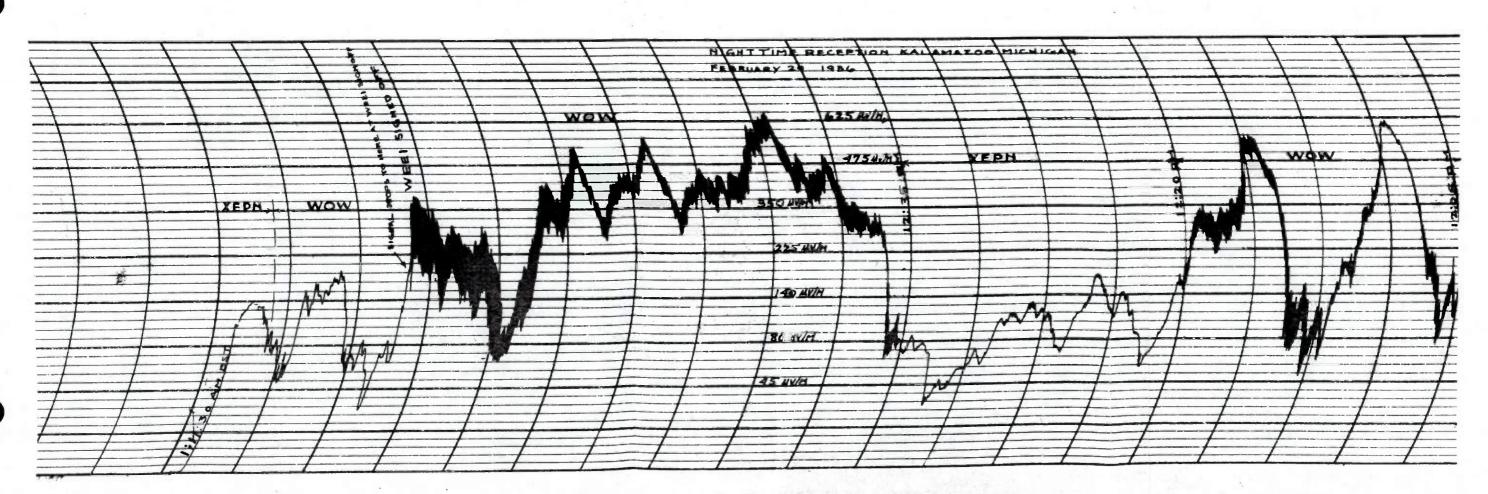
During the two one-half hour periods in which the signal from X E P N was recorded, the maximum signal ten percent of the time was 115 microvolts. On this night there was a strong beat on the channel at intervals as shown by the graphic record. No other station was indentified.

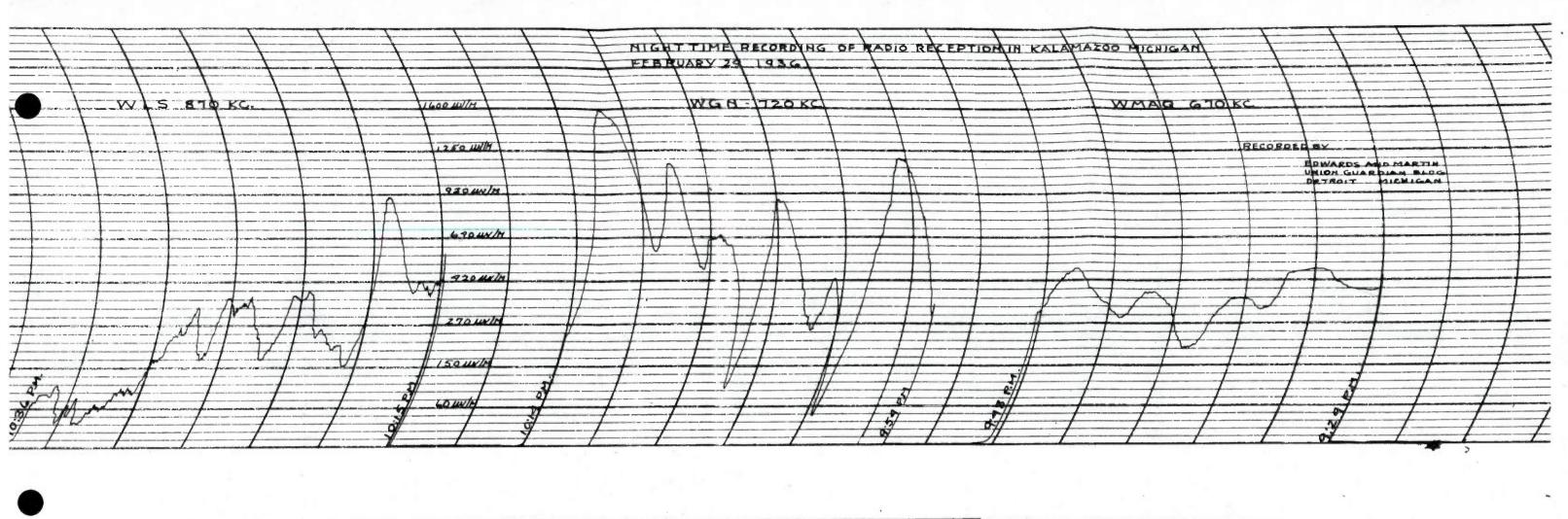
Edwards and Martin.

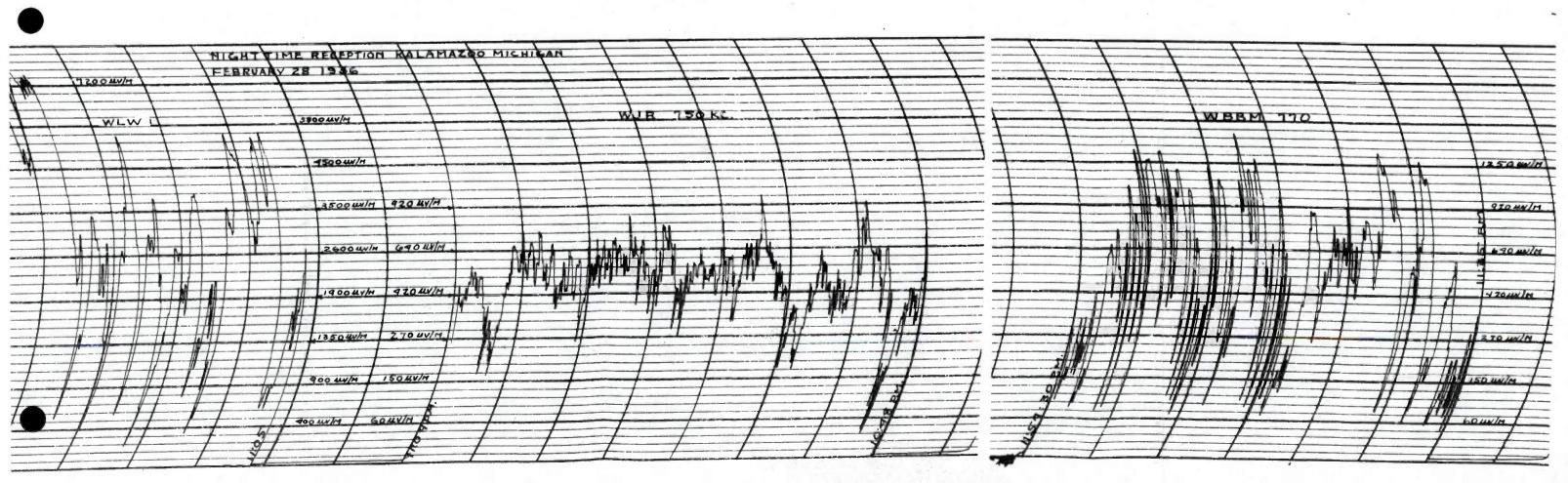












WKZO Directional Proof Feb 23, 1940

This proof is from 1940 when WKZO got 1.0 kw at night. Check out the Consulting Engineer and his letterhead. Yes, the original letterhead has red lightning bolts. There is a story all by itself, I'm sure.

This array is a two tower, wide spaced system with the line of towers on 86° and 180° spacing (844 feet). The two towers are fed in phase. This will produce a 2-blade propeller pattern with nulls on 86 and 266°. Some of the proof is missing, mostly the data, curves and diagrams. Someone pulled the data and it was never returned.

There are three pages in the discussion that will not copy because the onion paper has turned dark brown. Must have been real onion skins! Looks like its different paper than the rest of the paper used in the proof. It states that the phase monitor is an oscilloscope with one tower fed into the vertical plates of the scope tube and the other tower fed

to the horizontal plates. The one-to-one phase ratio and corresponding pattern on the oscilloscope were maintained throughout the proof. Temporary current samples were used at the feed to each tower. After the array was set the sample system was removed and the array operated without phase monitor or monitor points. The consultant noted that the stability of the array was excellent.





RADIO BROADCAST EQUIPMENT

-17\m

Proof of Performance
WKZO Directional Antenna System
February 23, 1940

COMPETENT ENGINEERING CONSULTATION ON YOUR ANTENNA, TRANSMISSION, AND COUPLING PROBLEMS

VICTOR J. ANDREW

6429 S. LANGON ILLINOIS

BUL. 8



Description of Antenna Array.

The description of the WELO Antenna system is as follows -

- a. Number of elements: 2
- manufactured by the Lehigh Structual Steel Company. They are of the oquare base, tapering type.
- 0. Top loading: Hone
- 4. Height of vertical lend of each element above ground:
- e. Height of vertical lead of each element above insulators: 525 feet.
- 2. Height of each element above sen levels Approximately 1110 feet.
- degrees true. Space phasing is 182 degrees or 844 feet. Time phasing is seen. The two elements carry gurrent of equal amplitude.
 - About each tower there are 150 radial ground wires buried to a depth of 12 inches. Wires are Sumber 10 hard drawn copper. At the base of each tower is a ground screen, each screen consisting of one inch mesh copper bearing Sumber 16 wire. These screens are beaded to each radial. Nach radial, is 400 feet in length. Each ground serven is 80 feet square and lies on top of the ground.
- i. The sermal currents are:
 - 1. Current into phasing unit (point of power measurement) is 5.00 amperes. The operating registance is 65.0 ohms.
 - amperes.
 - amperes.
 - Phase monitor reading is says degrees.

j. Figure 1 is a schematic diagram showing the radio free quency circuits from the transmitter to the antenna. Table 1 shows the components in this figure.

k. Tower painting and lighting:

Theh tower is sainted throughout its height with elternate horizontal bands of international orange and white, terminating with orange bends at both top and bottom. The orange bands are 38 feet wide und the white bands are 10 feet wide. At both the one-third and two-thirds level of each tower there are inscalled two 100-matt Type Awil Glong Bulb Traffia lamps in eviation red prisentic globes, at each level, o each at disgonally opposite corner At the top of each tower is install a Groups and Hinds Standard 800 m sirways electric beacon. The bead cons are equipped with two each Tyl FS-40 800 Watt profocus alour lamps and aviation red color shades. Both lamps in each beacon burn simultan cousty. The bessens are flashed & a sangamo flasher produsing 43 flaches a minute, having a luminous period of one second and a period .becood listered to esecute

Field Intensity Measurements.

The current at the point of power measurement was maintained at 5.03 amperes while field istensity measurements were being made. Tables II to XIII inclusive show the field intensity measurements made along twelve radials. Pigs, 8 and 8 are maps showing the locations at which these measurements were made. Figs. 4 to 15 inclusive are a group of graphs for the various radials, showing distance on a linear scale as abscissa and distance times field intensity on a legarithmic scale as ordinate. Fig. 16 is a group of theoretical curves used in proparing the radial curves. The usual practice in the case of directional automa systems is to take no field intensity measurements within a distance of ten times the space between elements. In this case, this means 1.6 miles. A few electripoints have been presented in this data because: (1) In the two directions perpendicular to the towar line, the reason for this progention obviously does not exist. (2) In the four directions representing helf-maximum field intensities, calculations show that measurements taken within a distance of five times the tower separation will have an erpor of only 15. (5) on the six redicts near the tower line, only culations show that the effect of tower spacing is to produce an error of several hundred percent on measurements at a distance of 10 times the tower spacing, and an error of appreciable magmitude at 100 times the tever spacing. Consequently, the nature of this effect was thoroughly investigated as described hereafter. The computation of field intensity at a given distance and direction with allowance for the fact that the two radiators are not a point course follows standard procedures, except that the

field intensity is set the same for each redistor. To illustrate, at a point 2 miles from the center of the apray, on the tower line: Mach redictor is assumed to produce 150 millivolts per motor unattermated at one mile. Since the separation between the two radiators is 0.16 mile, the actual distance to one rediator is 1,00 miles and to the other radiator is 3,00 miles. Comsequently the unattenuated fields will be 70.1 and 70.5 millipolic per motor respectively. These two field intensities ere 1800 out of phase because the towers are spaced by 1800. A trignometric calculation of the vector sum of these two field gives 7.65 millivolte per motor as the true unattempated field at this point, or a value of 15.3 for the product of unattermated field times distance. A similar calculation for an infinite distance gives field times distance of 5.2. This latter figure is the figure that is of importance in determining what interference will popult to WOW and WHMI. The actual measures field at 8 miles will be 7.65 less ground wave attenuation.

Par guidance in interpretation of measurements of field intensities sear the tower line, calculations were made by the procedure berebefere described for numerous combinations of distance (0.5 to 86 miles), direction (on tower line and 10° off tower line), surpent ratio between redictors (equal, 15 high in nearer element and 25 high in further element), place difference between elements (save, 2° lead in nearer element, and 2° lead in further element), and ground wave attenuation (conductivity 2, 3, 4, and infinity times 10° 14° c. m. u.). The data derived in this manner showed only slight variations for those various assumptions close to the elements (within 5 miles), where the effect of the distance between

eight curves semputed in the manner described. These curves show distance in miles as abscissa and distance times field intensity in millipolts per moter as ordinate.

The assumptions used in drawing those curves are: Direction, distence, and ground wave conductivity as shows on the curves. Current ratio 1:1. Phase difference sere. The curves for the direction 80° (tower line) have an unattennated value of field times distance of 8.8 at an infinite distance. The curves for 70° (10° off the tower line) have an unattennated value of field times distance of sere at infinite distance.

The curves in Fig. 17 differ from these in Fig. 16 in that they may not be adjusted in magnitude (moved up and dawn on the legarithmic scale) when they are used to analyze the measured field intensity data. The mothed used in computing these curves would be invalid if it were assumed that some random cause scald make appreciable variations in the magnitude, since the most probable cause of such variation is error in an assumed constant in the computation. The most suitable use of the curves in Fig. 17 is to compare with the deviations between measured points and assumed values for unattermated and distance-corrected field intensity in Figs. 5, 6, 7, 11, 12, and 15.

Pig. 18 is a polar diagram showing the unattennated field inteneity at one mile, and Fig. 19 is a similar curve on an expanded scale. These curves indicate that the RMS unattennated field intensity at one mile is 190 millivelts per meter, that the unattenuated field intensity at one mile in the direction of WGW is 6 millivelts per meter, and that the unattennated field intensity st one mile in the direction of STMI is 10 millivelts per meter. Fig. 80 is a map showing the 88, 10 and 8 millivelt per meter contours. In order to verify that the directional array was properly adjusted, before the final measurements of field intensity just described were unde, measurements of the ratio of directional to nondirectional field intensity were unde around an approximate elsele. This data is tabulated in Table 14 and shown in polar diagrams in Figs. 81 and 88.

have been smitiplied by 175 to correspond to an assumed unattennated RMS field intensity of 175 millivolts per meter for the non-directional entenna. These curves indicate as unattenuated field intensity of 2 millivolts per meter at one mile in the direction of WGW, 2 millivolts per meter at one mile in the direction of WGW, and an RMS unabtenuated field intensity at one mile of 165 millivolts per meter.

Tables AV and EVI show the measurements of posistance and reactence made at various frequencies for directional and nondirectional operation respectively. Pigs. 23 and 24 are curves
of resistance versus frequency for directional and nondirectional
equation respectively. Per directional operation, Pig.23 indiquies that the resistance at 800 kilocycles is 70.3 chms. In
accordance with F. G. G. rules, allowance for power lost in phasing and coupling equipment and transmission line is made by assuming the operation antenna resistance to be 0.025 times the
measured antenna posistance, or 65.0 chms. The normal antenna
current for 1000 matte is 5.08 amperes.

For mondirectional operation, Fig. 86 indicates that the resistance at 800 kilocycles is 15.88 chms, and that the correct antenna current for 1006 watts is 8.80 amperes.

5. Methods of Measurement and Calibration of Instruments.

The field intensity measurements tabulated in Table II to XIII inclusive were made with Federal Telegraph Company Field Intensity Motor type 181-8, serial number 50784. The procedure for measurework consisted in selection of suitable measuring location (freedom from measby wires or other likely sources of disturbance), and balibration and measurement by the standard procedure prescribed in the instructions supplied with this instrument. The instrumont was eperated on a weeden triped, at pafficient distance from as automobile body to prevent appreciable disturbance of the field intensity by the automobile body. The field intensity meter was purchased new from Federal Telegraph Company on Junuary 30, 1940. The manufacturer's enliberation was used. In relief to enliberation of this instrument, the manufacturer states: "We have a motor which was calibrated by the National Buyong of Standards and we use this as a standard against which all meture are checked prior to shipment. Your motor was checked against this standard on the date prior to shipment and was femal to be within \$5 of absolute es compared with the Europe of Standards calibration. Federal Telegraph Company, (signed) A. W. Rhinew.

The field intensity measurements tabulated in Table XIV were made with a special radio receiver designed for engineering use and formerly used as one component in a field intensity meter. This receiver has no AVE, was used with an automobile whip antenna, and is provided with a seter especially scaled to read proportional to field intensity. Relative measurements only were taken with this meter. The automas system was guitahed between directional and nonlineational every few seconds while these measurements were

being made, in order that observations of the relative field in the two positions might be made. During those measurements, the imput impedance to the phasing unit was identical for directional and for mondirectional operation. The transmitter input was constant and approximately narual during those measurements. These mengurements therefore do not show and difference which may be present due to actual lesses in the phasing and coupling equipmost and transmission line in the directional and the nendirectional position, and do not allow the increase in power permitted in the directional position to allow for such less. The same padio receiver was used during measurement of antenna recistance, The amester used for determination of power in directional operation (in the input to the phasing unit) is Westen Westrical Instrument Corporation, model 808, serial number 146, range 0 - 8 emperes, reled accuracy 85 of full scale. This motor was purchaged now from Westen Wastrical Instrument Corporation on or about January 1, 1940.

The antenna ammeter used for nondirectional operation is a Westen Miestrical Instrument Corporation model 805, serial number 169, 9 - 28 empere scale, rated accuracy 25 of full scale. This meter was purchased new from Westen Miestrical Instrument Corporation on apont Pebruary 25, 1940.

Antenna resistance measurements were made with a radio frequency bridge. The direct method of measurement was used, with the addition of a ceries condenser in the unknown leg. The points marked "X" in Fig. 1 are the points at which antenna resistance was measured.

The General India Company bridge type \$18-6, serial number 465 bas a rated accuracy of measurement of \$5. This bridge was pur-

The Richek Tiestrical Instrument Company on or about October 1, 1990. The Richek Tiestrical Instrument Company signal generator type 180% is provided with a frequency scale which may be read to 1 kilocycle at the frequencies measured. It contains an internal standard of frequency consisting of a piece-lectric oscillator producing standard frequencies every 100 kilocycles. The accuracy of frequency determination in these measurements was within plus or name 1 kilocycle.

The capacity and resistance of the fixed sice condenser used in the unknown leg of the bridge is measured and compensated for in the method of measurement used.

. Qualifications of the Engineer.

Victor J. Andrew, 6130 South Lavergne Avenue, Chicago, Illineis, who made those measurements, completed his education at the University of Chicago, and was granted the degree of Dector of Philosophy by that institution. He has been actively engaged in radio engineering for twenty years, and particularly in breadenet station entenns engineering for the last six years, during which period he has presented engineering testimony to the Pederal Communications Commission in hearings or in affidavits on numerous eccassions.

Dated this Sord day of February, 1940.

Victor J. Andrew

WKZO Requests 5.0 kW Daytime Power May??, 1940

Back in 1940, it sure didn't take much of an engineering report to get a power increase. Only 7 pages, if you include the report cover. The report is not dated so this must have been a preliminary or courtesy copy. Also, it looks like WKZO never used the same consulting engineer twice in a row. Interesting that they did the two tower nighttime array first. I'll bet that they used the non-directional proof measurements to show the power increase would work. Yes, check out the footnote on the conductivities table.

ENGINEERING AFFIDAVIT WKZO, KALAMAZOO, MICHIGAN 590 KC APPLICATION FOF 5 KW DAY May 1940

Mc NARY AND CHAMBERS
RADIO ENGINEERS
NATIONAL PRESS BUILDING
WASHINGTON, D. C.

WASHINGTON.D.C

ENGINEERING AFFIDAVII WKZO, KALAMAZOO, MICHIGAN 590 KC.

APPLICATION FOR 5 KW. DAY

City of Washington

ss s

District of Columbia :

Joseph A. Chambers, being duly sworn on his oath, states that he is an experienced and qualified radio engineer, and a nember of the firm of McMary and Chambers, Radio Engineers, Washington, D. C., which firm has been retained for certain engineering services by the licensee of WEZO, Kalamasoo, Michigan.

WKZO now operates on 590 KC with a power of 1 KW, unlimited time, using a directional antenna at night only. WKZO proposes to increase day power to 5 KW.

Attached hareto are two maps showing the present 1 KW contours, and the calculated contours with 5 KW, as proposed. Since the application involves day operation only, operation will be non-directional.

Attached is a tabulation of the earth conductivities used in calculating the location of the contours. These values of conductivity (and the distance to many of the contours) were indicated by field measurements taken during the test of the site, and the proof of performance of the WKZO antenna, and are believed to truly represent the average earth conductivity to the various contours.

No interference is expected within the normally protected 0.5 mv/m contour.

No change in site or antenna is proposed by WKZO.

Details of the present WKZO site and antenna are on file with the Commission.

Measurements of the WEZO antenna (during the proof of performance measurements) indicate that it produces 190 sw/m at one mile, unattenuated, for 1 KW power. This would produce 425 mw/m at one mile for 5 KW. These values were used in calculating the location of the contours.

shown on the attached tebulation. These populations were determined by applying the contours, as shown, to United States Census
Bureau maps of Minor Civil Divisions, and referring to the Report
of the Fifteenth Census of the United States (1730). Cities and
towns not receiving sufficient signal to provide satisfactory service
(as defined by the FCC Standards of Good Angineering Practice) were
deducted. The population estimates were made in accordance with the
precedure set forth in the FCC Standards of Good Angineering Practice.

Affiant states that the foregoing statements are true of his own knowledge, except such portions of it as are on information and belief, and as to such portions, he believes them to be true.

	Josey	h A. Chambers
Sworn to before me this_	day of May, 1940.	
	Notar	y Public
ty Commission expires		

TABULATION OF MARTH CONDUCTIVITIES AND

DISTANCES TO CONTOURS

WEZO - 1 and 5 KW. DAY 590 MC

CONTOUR, Dist. an			50 T	D	25	D.	5	2 D	σ	0. D	5
North	1 KW 5 KW	.76 1.55	15 10	5.7 11.5	3.5 5	20 34.5	5	35 50	5 5	67 100	5 5.5
Mm	1 KW 5 KW	.76 1.55	15 10	5.8	4.5	19 29.5	4.5	31.5 48	4.5	62 90	4.5
West	l gw 5 km	.75 1.55	15 10	6.0	4.2	17 26	3.5 3	26 40	3	50 74	3 3•2
34	1 KW 5 KW	.71 1.5	15	1.9 8.5	3 2.5	14 21.1	2.5	22 33	2.5	41 60	2 2.5
South	1 gw 5 gw	.76 1.56	15	5.8	4.5	19 29.5	4.5	32 48	4.5 4.5	63 90	4.5
S72	1 EW 5 RW	1.66	15	5.8	4	17.3 26	4.5 3.2	27.5 40	3.2 3	52 75	3.2 3.2
East	1 gw 5 gw	.75 1.52	15	8.4	2.5	15.1 22	3 2.5	24 33	2.5	41 60	2.5
NE	1 KW 5 KW	.76 1.6	15	6.0	5 4.5	18.7 29.5	4.5	32 48	4.5	62 90	4.5

D = Distance in miles to contours. T = Conductivity (x 10-14 e.m.u.)

everage to contour. Minor adjustments in D were made for local conditions,

as indicated by R vs D curves resulting from measurements during site tests

and proof of Directional Antenna verfor ance (Curves filed with FCC).

TABULATION OF POPULATION WITHIN VARIOUS CONTAURS OF WEST OPERATING SITH 1 KW DAY AND MITH 5 KM DAY

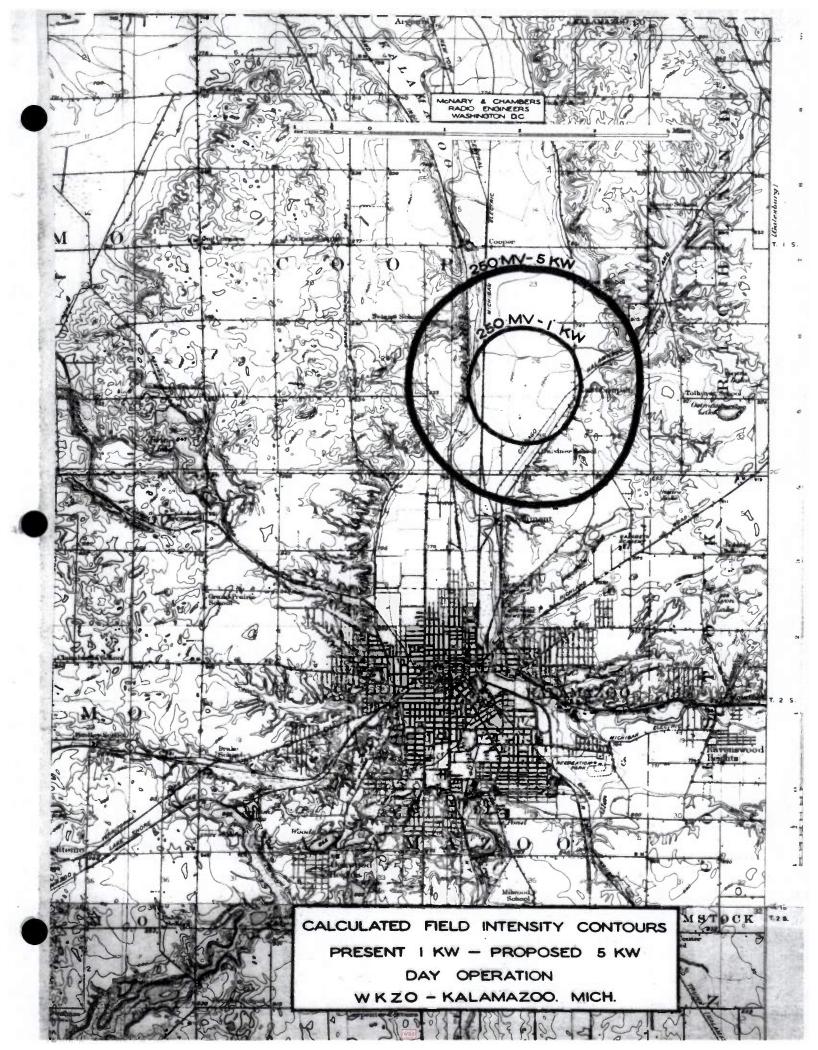
Contour, sv/m	Persons Area	Persons Area		
250	44	200		
25	68,373	87,944		
5	111,793	205,832		
2	214,057	578,997		
0.5	685,537 9700	1,202,822 17,650		

Portions of cities and towns not receiving signals of sufficient signal to provide satisfactory service (as defined by FCC Standards of Good Engineering Practice) not included in above population rightes.

TABULATION OF POPULATION WITHIN VARIOUS CONTOURS OF WKZO OPERATING WITH 1 KW DAY AND WITH 5 KW DAY

Contour, mv/m	1 KW	5 KW
250	44	200
25	68,373	87,944
5	111,793	216,730
2	235,844	597,068
0.5	764,056	1,505,770

We deductions have been made for cities, outside of the 25 mv/m contour, which do not receive signals of sufficient intensity to provide satisfactory service.



FCC Form 303-B

License Application for 5 kW Nighttime operation <u>July 26, 1944</u>

The proof for the 4 tower directional array is missing but I found the license application to cover the construction permit. There is some good stuff here. When WKZO went to 5 kW they installed an RCA 5DX. The RCA 5DX was a huge behemoth of a transmitter build on the floor with a walk-in cage on the backside. When I worked at KARN in Little Rock, AR, there was one in the transmitter building as a back up. We never ran it, we were afraid of it. The caged back of the transmitter also had the open panel phasor built on the back wall. To adjust the phasor required the operator to be inside the cage when the transmitter was operational and reach over the modulation transformer. The open-air modulation transformer was on the floor under the phasor panel with about 8500 volts of B+ supply on it. Four wire open transmission line fed the two-tower array. No, I never took any pictures of it, sorry

to say, wish I had. But, somebody may have and I'll try to get a copy of it, if one exists.

The WKZO license has the signatures of Fetzer and Lee and a July 26, 1944 date. Carl E. Lee was the Chief Engineer. The array used an RCA 300-A phase monitor. Three of the original Lehigh towers are still standing. One was replaced after it came down in a storm some time in the 60's, I think.

The guys here at the office all agree that the original 4-tower array must have been a handful to tune. Note that tower #1 and #3 are fed the same phase from a single T network in the phasor with no ratio adjustment between them and only L networks at the tower bases. I just have to believe that system didn't play well with beginners. There is no mention what company built the phasing equipment. I would guess Mr. Lee built it on site.

UNITED STATES: OF AMERICA F.C.C. FORM 303-B UNITED STATES OF AMERICA Form Approved (Adopted May 1944) FEDERAL COMMUNICATIONS COMMISSION Budget Bureau No. 52-R099

Form Approved

CALL LETTERS WKZO

STATEMENT OF TECHNICAL INFORMATION CONCERNING STANDARD BROADCAST STATIONS USING DIRECTIONAL ANTENNAS1

TO THE FEDERAL COMMUNICATIONS COMMISSION:

Desc	ription of to	cansmitting app	aratu	S :				
(a)	MakeRCA	Type 1	No	5 DX	Serial N	o. BC	1800	
(b)	Oscillator:	Type of circu	RC	A Labs.	Type and Ma	nufactur	er	
	of tubes F	RCA 802	nagari garangan sabih	nariom de reggio di litti			***	
(c)	List buffer	and intermedia	te po	wer amplifier	s by number	and		
	type of tube	s in each stage	one	802, one 8	305, two 80	5's.		
(d)	Last radio s	tage: Number,	manu	facturer and	type of tube	s_One		
	RCA 892 R	Norma	al da	ytime operati	on: Plate			
	current per tube 0.56 amp. plate voltage 9.0 KV.							
	Normal night	time operation:	Pla	ate current p	er tube 0	.6 amp.		
	Plate voltag	e9.0 KV.			4		-	
Mete	rs in last ra	dio stage		_	* *			
		Make Type	Ran	_{ge} 2	Normal Re			
Plate	Voltmeter	Weston 741	0 -	-12 KV.	9 KV.	9 KV.		
Plate	Ammeter	Weston 741	0 -	.1.5 amps.	0.56 amp	s. 0.6	amps	
Plate	Ammeter		0 -	•				
Desci	ribe fully th	e method and pr	ocedu	ure of reduci	ng power at	suns•t		
-			· · · · · · · · · · · · · · · · · · ·					
						· · · · · · · · · · · · · · · · · · ·		
-								

Trile in triplicate. (Swear to one)
2 Specify volts, amperes or milliamperes as appropriate.

(e)	Modulator or last audio stage: Number, manufacturer and type
	of tube: Two RCA 891 R Class of operation ("A", "A" prime, or
	"B") "B" actual plate current per tube (85% modulation)
	400 M.A. plate voltage 9.0 KV.
(f)	Which stage is modulated? Final
(g)	What system of modulation is employed (high-level, low-level, grid
	bias in last radio stage or high efficiency grid bias in last radio
	stage, etc.) High-level
(h)	If low level modulation is employed, give for modulated radio stage:
	Number and type of tubes plate current per tube
	plate voltage
(i)	State make and type of modulation monitor General Radio Co. 731-A
(j)	Give F.C.C. approval number of modulation monitor 1551
(k)	Describe the plate power supply for last radio stage 3 phase full wave
	Rating: Current 1.6 amps. Voltage 10 KV.
(1)	Maximum rated carrier power of transmitter as determined by the
	Rules and Regulations of the Federal Communications Commission is
	5000 watts.
(m)	Are all operating values specified above regularly maintained?
	Yes If not, give full details
Desc	ription of automatic frequency control equipment:
(a)	Make RCA Type No. UL-4292
(b)	Give manufacturer's name, type of cut, and temperature coefficient
	in cycles per degree centigrade of the quartz crystal
	RCA V-Cut crystal
	Not more than 1.77 cycles per degree centrigrade.

. 2.

State num	ber of frequency control oscillators which are maintaine
constantl	y at correct operating temperature and frequency in heat
controlle	d chambers Two
Is provis	ion made for instantaneous connection of spare frequency
control u	nit or crystal? Yes
Manufactu	rer's name and type of automatic temperature control
RCA	type TMV-129 B
Descripti	on of frequency monitor:
(1)	Manufacturer's name RCA Type No. 311 AB
(2)	Serial No. 643 F.C.C. Approval No. 146
(3)	Describe method by which the accuracy or calibration of
	the frequency monitor is checked and periodicity of each
	check Compared with report of transmitter fre-
	quency by Peterkin Radio Laboratories, Detroit
	Michigan - monthly.
(4)	Give date of latest check July 5, 1944
(5)	Within how many cycles of the assigned frequency did the
	check reveal accuracy of the monitor to be? O cycles
(6)	If adjustments of the calibration of the monitor were
	made, within how many cycles of the standard was the fi
	quency of the monitor finally adjusted?

3. N	on-directional antema. 3 stops of some agreement of the some at the some of th
· · · (-	a) Type (Uniform cross-section, tapered, etc., triangular, square,
4 * ***	etc., guyed or self-supporting Tapered square, self-supporting
4.*,	
(1) Height of vertical lead (height above base insulator, or base if
	grounded)325 feet
(c	e) Give over-all height of element above groundlevel (in feet) 330 ft.
(d) Height (in feet) of building or substructure (distance from ground
	to base of tower) 5 feet a second of tower)
, (e) Make of tower Lehigh
(f) Attach sketch or photograph See Figure 1.
](g). Counterpoise (if used) type and dimensions = = = = = = = =
(h) Antenna ground (if used) - how obtained 120 radials 427 feet (Number and length of
a 45g. a s	long buried approximately six inches. radials, depth buried, etc.)
(i) Is tower painted and lighted in accordance with existing license?
	Yes.
(j)	Series
(k	If not fully described above, give complete details No. 4 tower used
(1)	
· :'/	Make Type Range (amps) Day Night
Ant	enna Ammeter Weston 425 0 25 15.11 7.25
Ren	note Antonna AmmeteWeston 425 0 - 25 15.11 7.25

If one element of a directional antenna is employed, specify the element and the operating condition of other element or elements (i.e., floating, grounded, detuned, etc.).

4.	Dayt	ytime directional antenna (if used).						
. •	(a)	Number of elements						
	(b)	Type of elements (Uniform cross-section, tapered, etc., triangular,						
		square, etc., gayed or self-supporting)						
•								
• /	(c)	Attach sketch of antenna system identifying each element by a						
		number_						
	(d)	Height of vertical leads:						
		Element No. 1 Element No. 2 Element No. 3						
		Element No. 4 Element No. 5 Element No. 6						
		(Height above base insulator or base if grounded)						
	(e)	Give over-all height of elements above ground level (in feet):						
		Element No. 1 Element No. 2 Element No. 3						
		Element No. 4 Element No. 5 Element No. 6						
	(f)	Height (in feet) of building or substructure (distance from ground						
		to base of towers):						
		Element No. 1 Element No. 2 Element No. 3						
		Element No. 4 Element No. 5 Element No. 6						
	(g)	Make of towers						
	(h)	Counterpoise (if used) - type and dimensions						
	(i)	Antenna ground (if used) - how obtained [Number and length of radial						
		(Number and length of radial						
		and depth buried, etc.)						
	(j)	How is antenna excited (shunt or series)?						
	(k)	Orientation of array with respect to true north						

(1)	Space phasing of elements (sp	ecify feet and degrees	:
	Element No. 1 to 2	ft.,	٥.
	Element No. 1 to 3		
	Element No. 1 to 4	ft.,	٥,
	Element No. 1 to 5		
	Element No. 1 to 6	ft.,	٥,
(m)	Time phasing of elements (Spe	cify degrees leading or	r lagging):
	Element No. 1 Element	No. 2 Elemen	nt No. 3
	Element No. 4 Element	No. 5Elemen	nt No. 6
(n)	Ratio of currents in each elem	ment at the base (or in	n the feed wire in
	operated grounded):		
	Element No. 1 Element	No. 2 Elemen	nt No. 3
	Element No. 4 Element	No. 5Elemen	nt No. 6
(0)	Are towers painted and lighted	in accordance with ex	cisting license?
	"Yes" or "No"	-	
(p)	If not fully described above,	giro complete details	
· (P)	ii noo laliy described above,	Sive combiere defails	
(p)	Antenna ammeters:		
	Make Type	Range (amps) Normal	Reading (amps)
Comm	on Point	0 ₩	reading (amps)
	te for Common Point	0 ==	
	ent No. 1	0	
	te for Element No. 1	0	
	ent No. 2	0 -	
	te for Element No. 2		
~~~~	A TO MEDITOR NO.	0 -	,

(q) Antenna ammeters: (continued)

Make Type Range (amps) Normal Reading (amps) Element No. 3 0 -Remote for Element No.3 0 -Element No. 4 Remote for Element No.4 Element No. 5 Remote for Element No.5 Element No. 6 Remote for Element No.6 0 -(r) Phase monitor ( if used): Make____ Amplitude: Element No. 2 Element No. 3 Element No. 4 Element No. 5 Element No. 6 Phase: Element No. 1 _____Element No. 2 ____Element No. 3 _____ Element No. 4 _____Element No. 5 _____Element No. 6 ____ 5. Nighttime directional antenna (if used): (a) Number of elements Four (b) Type of elements (Uniform cross-section, tapered, etc., triangular, square, etc., guyed or self-supporting) Tapered square, selfsupporting (c) Attach sketch of antenna system identifying each element by a number See Figures 2 and 3 attached.

(d)	Height of vertical leads:				
	Element No. 1325 ft Element No. 2325 ft Element No. 3325 ft.				
	Element No. 4325 ft Element No. 5 Element No. 6				
	(Height above base insulator or base if grounded)				
(e)	Give over-all height of elements above ground level (in feet):				
	Element No. 1 330 ftElement No. 2330 ft Element No. 3 330 ft.				
	Element No. 4 330 ftElement No. 5 Element No. 6				
(f)	Height (in feet) of building or substructure (distance from ground				
	to base of towers):				
	Element No. 1 5 ft. Element No. 2 5 ft. Element No. 3 5 ft.				
	Element No. 45 ft. Element No. 5 Element No. 6				
(g)	Make of towers Lehigh				
(h)	Counterpoise (if used) - type and dimensions				
(i)	Antenna ground (if used) - how obtained 120 radials 427 feet (Number and length of radials				
	long under each tower buried approximately 6 inches and depth buried, etc.)				
(j)	How is antenna excited (shunt or series)? Series				
(k)	No. 1 to No. 3 on line bearing 92° Orientation of array with respect to true north No. 2 to No. 4 on line bear-				
	ing 176° Space phasing of elements (specify feet and degrees)				
	Element No. 1 to 2 453½ ft., 97.8 °.				
•	Element No. 1 to 3 867 ft., 187 °.				
	Element No. 1 to 4 491 1/3 ft., 106 .				
• ··	Element No. 1 to 5ft.,o.				
	Element No. 1 to 6 ft.,				

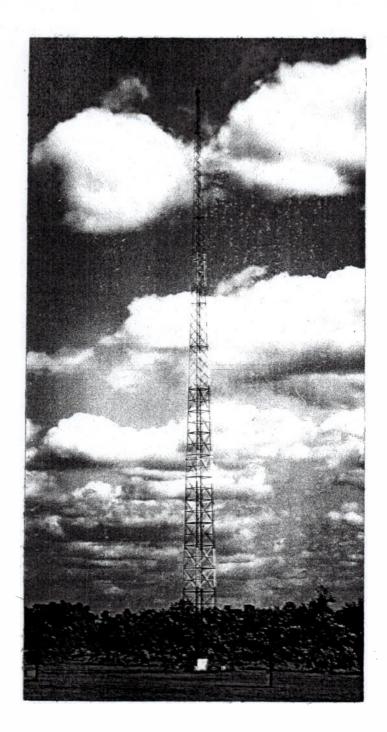
m) Time phasing of elements (Specify degrees leading or lagging):			
Element No. 1 0° Element	No. 2 -900 Element No. 3 00		
Element No. 4 +90° Element	No. 5Element No. 6		
(n) Ratio of currents in each eleme	ent at the base (or in the feed wire		
if operated grounded):			
Element No. 1 1.0 Element	t No. 2 0.747 Element No. 3 0.96		
Element No. 4 0.72 Element	No. 5 Element No. 6		
(o) Are towers painted and lighted	in accordance with existing license?		
Yes			
(p) If not fully described above, g	give complete details		
(q) Antenna ammeters:			
Make Type	Range (amps) Normal Reading (amps)		
Common Point Weston 425	0 - 15 7.9		
Remote for Common Point Weston 425	0 - 15 7.9		
Element No. 1 Weston 733	0 - 15 10.25		
Remote for Element No.1 Weston 425	0 - 15 10.25		
Element No. 2 Weston 733	0 - 15 7.5		
Remote for Element No.2 Weston 425	0 - 15 7.5		
Element No. 3 Weston 733	0 - 15 . 9.5		
Remote for Element No.3 Weston 425	0 - 15 9.5		
Element No. 4 Weston 733	7.25		
Remote for Element No.4 Weston 425	7.25		
Element No. 5	0 -		
Remote for Element No.5	0		
Element No. 6	0 -		
Remote for Element No.6	0 -		

٠.	- Amplitude:	
	Element No. 1 Element No.	2 Element No. 3
	Element No. 4 Element No.	
	Phase:	. 1
		2 97 50 57
	Element No. 1 +235° Element No.	
	Element No. 4 0° Element No.	5Element No. 6
(a)	In what respect, if any, does the	apparatus, antenna, or operation
	differ from that described in the	last application for license or
	renewal of licenseNon	10
	(Iî no	ne, so state)
	No. of the second	
	ment affecting the schematic diagr	am heretofore filed with the Com-
	ment affecting the schematic diagramission, the applicant represents	am heretofore filed with the Com- that there is attached an accurate
There the ]	ment affecting the schematic diagr mission, the applicant represents  corrected diagram  Non  (If non  e are listed below the names of all preparation of the information reque	am heretofore filed with the Com- that there is attached an accurate e. e. so state)  parties who prepared or assisted ested by this questionnaire:  Name, address and official title
the j	ment affecting the schematic diagr mission, the applicant represents  corrected diagram  Non  (If non  e are listed below the names of all preparation of the information reque	am heretofore filed with the Com- that there is attached an accurate e, so state)  parties who prepared or assisted ested by this questionnaire:  Name, address and official title of person who prepared or assist
I tem	ment affecting the schematic diagr mission, the applicant represents corrected diagram  Non  (If non  e are listed below the names of all preparation of the information requestion of Description of Information	am heretofore filed with the Com- that there is attached an accurate  e, so state)  parties who prepared or assisted ested by this questionnaire:  Name, address and official title of person who prepared or assist in preparing the Item or Exhibit
I tem	ment affecting the schematic diagr mission, the applicant represents  corrected diagram Non  (If non  e are listed below the names of all preparation of the information requestry  or Description of Information	that there is attached an accurate  e, so state)  parties who prepared or assisted
I tem	ment affecting the schematic diagr mission, the applicant represents corrected diagram  Non  (If non e are listed below the names of all preparation of the information requestry or Description of Information	am heretofore filed with the Com- that there is attached an accurate  e, so state)  parties who prepared or assisted ested by this questionnaire:  Name, address and official title of person who prepared or assist in preparing the Item or Exhibit
I tem	ment affecting the schematic diagr mission, the applicant represents  corrected diagram Non  (If non  e are listed below the names of all preparation of the information requestry  or Description of Information	am heretofore filed with the Com- that there is attached an accurate  e, so state)  parties who prepared or assisted ested by this questionnaire:  Name, address and official title of person who prepared or assist in preparing the Item or Exhibit
I tem	ment affecting the schematic diagr mission, the applicant represents corrected diagram  Non  (If non e are listed below the names of all preparation of the information requestry or bit  Description of Information	am heretofore filed with the Com- that there is attached an accurate  e, so state)  parties who prepared or assisted ested by this questionnaire:  Name, address and official title of person who prepared or assist in preparing the Item or Exhibit

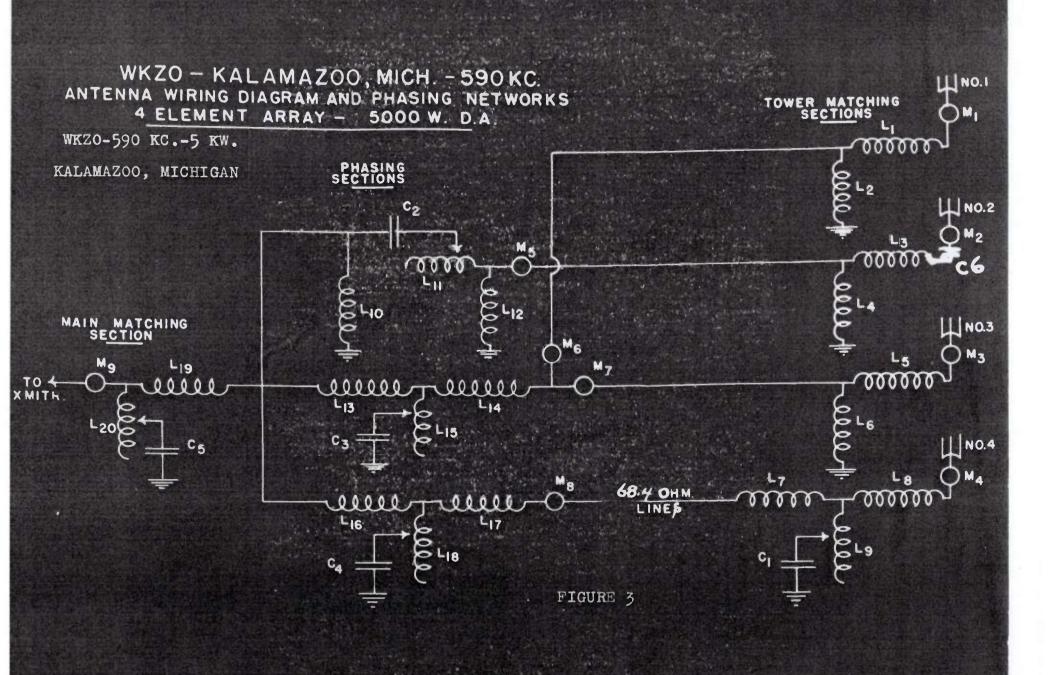
Dated this 26th day of July	, 194.
	Potzer prosecution Company Name of Licensee
	By John E. Felger
	Official Official
Subscribed and sworn to before me th	is 266m day of July , 1914
	is 26th day of July , 1914.  Wilms R. Beertema  Notary Public
STATE OF 10 / Lording	
COUNTY OF SALL 2000	
licensee of Radio Station 1620; th	being first duly sworn, deposes and says chief engineer for 1912 of 1900 of the hat he examined the within and foregoing and knows the contents thereof and that the true of his own knowledge.  Technical Director or Chief Engineer
Subscribed and sworn to before me this	
SEAL 5	Wilma R. Beertema Notary Public
My commission expires	
<u>/                                      </u>	
Must be subscribed and sworn to by I in the name of the partnership, by o	licensee if an individual; if a partnership, one member; if a corporation or association,

Must be subscribed and sworn to by licensee if an individual; if a partnership, in the name of the partnership, by one member; if a corporation or association, by an officer or by attorney for licensee which must be fully explained under the provisions of Section 1.121 of the Rules of Practice and Procedure.

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



WKZO - 590 KC - 5 KW NON-DIRECTIONAL ANTENNA Figure 1



# <u>Audio Proof of Performance</u> <u>June 1950</u>

When this audio proof was done WKZO was still running the RCA 5DX Transmitter. The report lacks a certification page, signature and date. So we don't know what engineer or consultant conducted the measurements.

JUHZ 1950

# Equipment Performance Measurement Radio Station WKZO

The equipment used was an RCA type 68B audio oscillator, an RCA type 69B distortion and noise meter, a type 73lA General Radio modulation monitor, an RCA model 862 VU meter and a Hallicrafters SX-42 communications receiver.

In testing the audio response of the system a 1000 cycle signal from the audio oscillator was fed into a microphone input circuit of the main studio program amplifier through a 48db loss pad. The amplitude of this signal was adjusted until one of the specified modulation percentages was read on the modulation monitor. The VU meter was connected across the amplifier input and the reading noted. The frequency of the oscillator was varied in regular steps from 30 to 7500 CPS. At each step the input signal was adjusted, if necessary, to get the specified modulation percentage on the modulation monitor. The change in DB's at the input from the reading at 1000 CPS was given by the VU meter. This procedure was repeated for the other specified modulation percentages to ob-

tain the data for the audio frequency response curves. Since modulating the RCA 5DX transmitter 100% with a sine wave for an appreciable time subjects the power supply circuits to dangerous strains, data was collected for 95% modulation, instead of 100%.

Since operation of the type 69B distortion meter requires a sample of the signal direct from the audio oscillator as well as one from the amplifier it was not practical to measure the distortion of the entire system in one step.

In the first step both the 68B oscillator and distortion meter were at the studios and the overall distortion of the studio equipment at the specified frequencies was measured in the regular way. In the next two steps the oscillator and distortion meter were at the transmitter. The regular and spare program loops were patched together at the studios and an oscillator signal was fed into one loop. The distortion present at the transmitter end of the other was then measured by the distortion meter. In the third step the overall distortion of the transmitting equipment was measured by feeding a signal into the audio input of the transmitter and measuring the distortion in the RF output fed back from a sampling loop

at antenna #4. The distortion readings obtained in each of the three steps were added to give the overall distortion.

The data showing percentage carrier shift was obtained by use of the modulation monitor. The carrier level meter of this instrument was first carefully adjusted to read 100 with no modulation. The transmitter was then modulated by 400 CPS output from the oscillator so that the percentage modulation meter read 25%. The change in carrier amplibude was read from the carrier level meter. This was repeated for the other modulation percentages.

To measure hum and extraneous noise a signal from the audio oscillator was applied to a microphone of the main studio amplifier. The distortion and noise meter input was connected to RF output from the sampling loop at antenna #4. The audio signal was adjusted to produce 100% modulation as read by the mcdulation monitor. The noise meter was calibrated to read .0 db. The input to the studio amplifier was removed and the residual hum and noise was measured by the noise meter.

To check on spurious radiations a Hallicrafters Model SX-42 communications receiver was set up at a point one mile from the transmitting antenna. This receiver was

connected to a suitable antenna such that the carrier level meter on the receiver read 36 db. above S9 when the receiver was tuned to 590 KC. Without changing the sensitivity of the receiver or the antenna the spectrum from 590 KC. to 8,890 KC. was checked for radiation from the transmitter. Except for the 5 points noted in the table below the response was negligible.

Frequency in KC.	Carrier Meter Reading
590	36 db. above S9
1180	S3.5
1770	\$4.5
2360	\$4.5
2950	S2

#### Audio Frequency Response

CPS	25%	50%	85%	95%
30	-0.8	-0.4	-0.2	-0.2
100	-1.0	-1.0	-1.0	-1.0
300	-0.6	-0.8	-1.2	-0,8
500	-0.5	-0.1	-0.1	-0.1
1000	0	0	0	0
2000	+0.8	+0.3	+0.5	+0.5
3000	+0.2	+0.4	+0,6	+0.5
4000	+0.2	+0.4	+0.5	+0.5
5000	<b>†</b> 0.1	+0.2	<b>†0.</b> 6	<b>‡</b> 0.7
6000	0	-0.1	-0.2	0
7500	-1.5	-1	-1.2	-1

#### Percentage Carrier Shift

Modulation	25%	50%	85%	100%
Carrier Shift	1%	2.5%	5%	5%

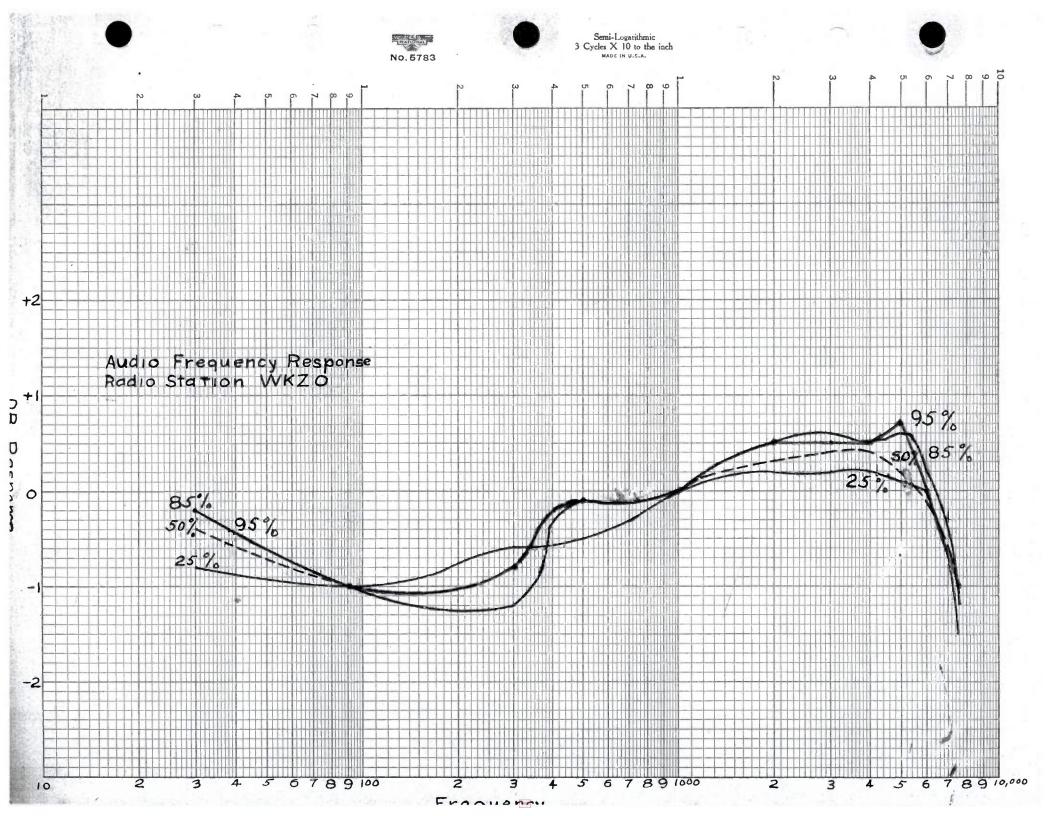
Carrier Hum and Extraneous Noise

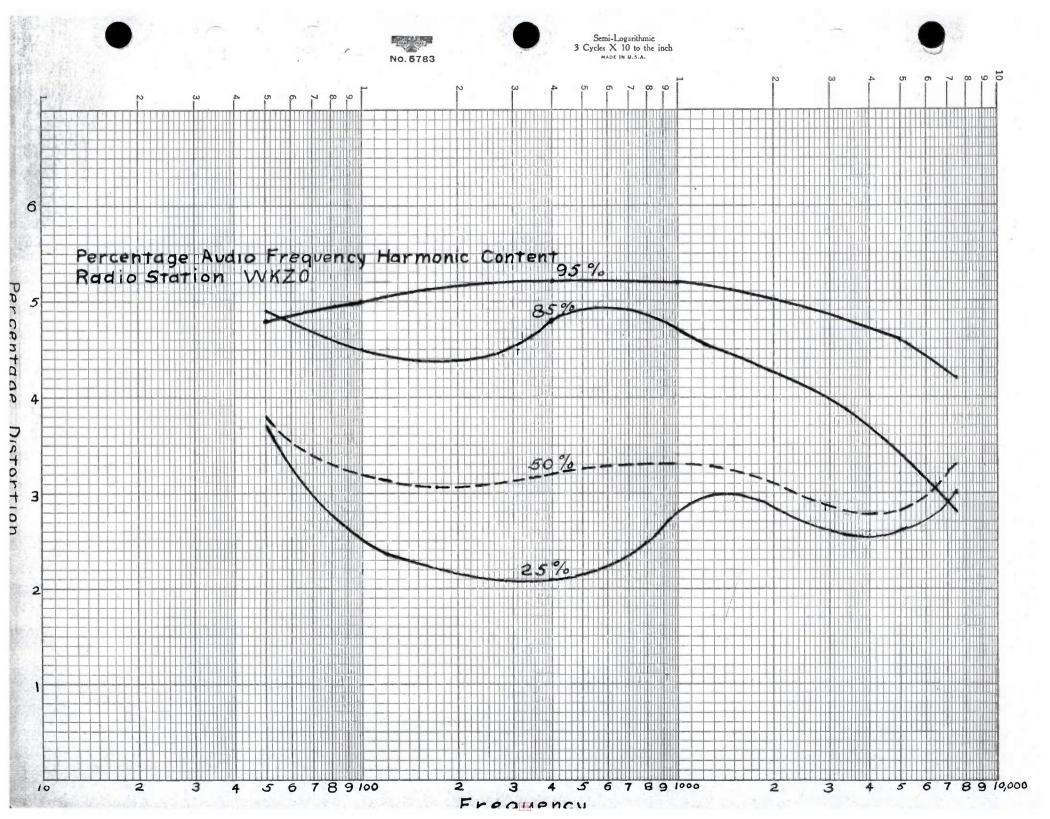
58.5 DB below 100% modulation

#### Percentage Audio Frequency Harmonic Content

#### 25% Modulation

	50 CPS	100	400	1000	5000	7500
Studio Amplifier Phone Loop Transmitting	1.4 0.2 2.1	0.8 0.2 1.5	0.7 0.2 1.2	1.0 0.2 1.6	0.7 0.2 1.7	0.8
Equipment Total	3.7	2.5	2.1	2.8	2.6	3.0
	50%	Modulati	on			
	50 CPS	100	400	1000	5000	7500
Studio Amplifier Phone Loop Transmitting	1.4 0.2 2.2	0.7 0.2 2.3	0.7 0.2 2.3	0.9 0.2 2.2	0.8 0.2 1.8	0.8 0.2 2.3
Equipment Total	3.8	3.2	3.2	3.3	2.8	3.3
	85%	Modulati	on			
	50 CPS	100	400	1000	5000	7500
Studio Amplifier Phone Loop Transmitting	1.5 0.2 3.2	0.8 0.2 3.5	0.8 0.2 3.8	1.0 0.2 3.5	0.7 0.2 2.5	0.8 0.2 1.8
Equipment Total	4.9	4.5	4.8	4.7	3.4	2.8
	0.5%	Moduloti	CM			
	•	Modulati 100		1000	5000	7500
Studio Amplifier Phone Loop Transmitting Equipment	95% 50 CPS 1.5 0.2 3.1	100 0.8 0.2 4.0	0.8 0.2 4.2	1.0 0.2 4.0	5000 0.8 0.2 3.6	7500 0.8 0.2 3.2

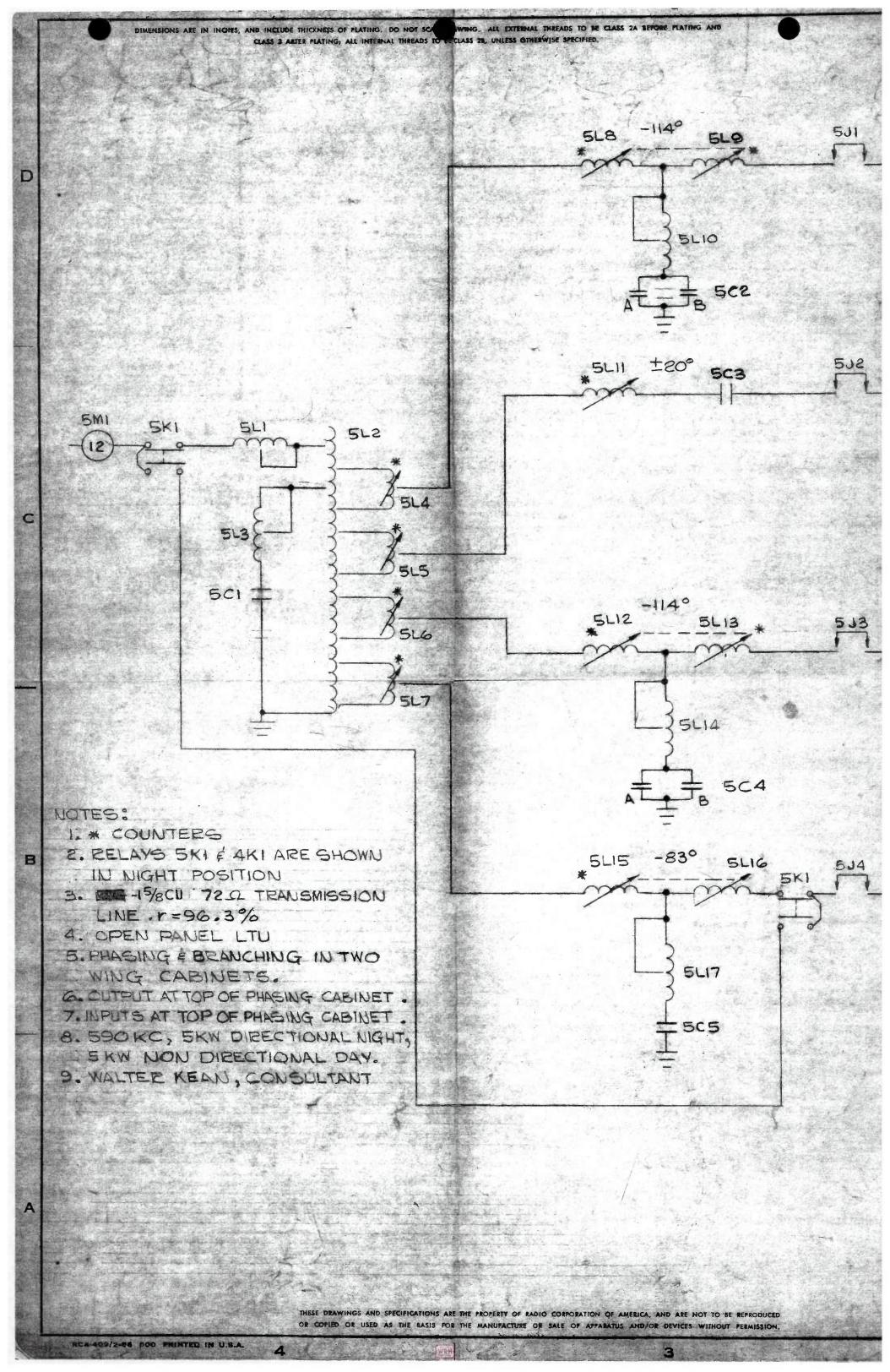


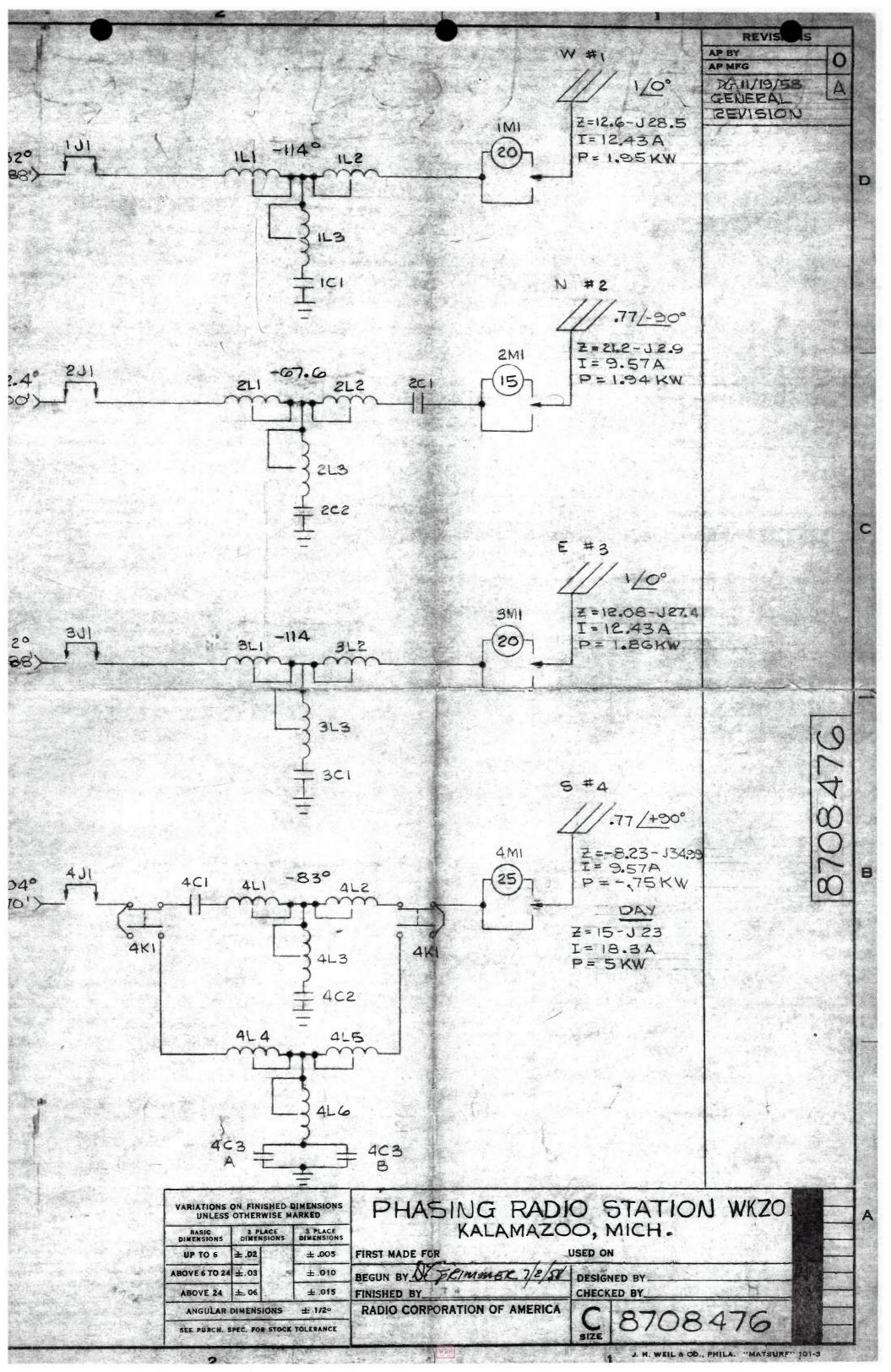


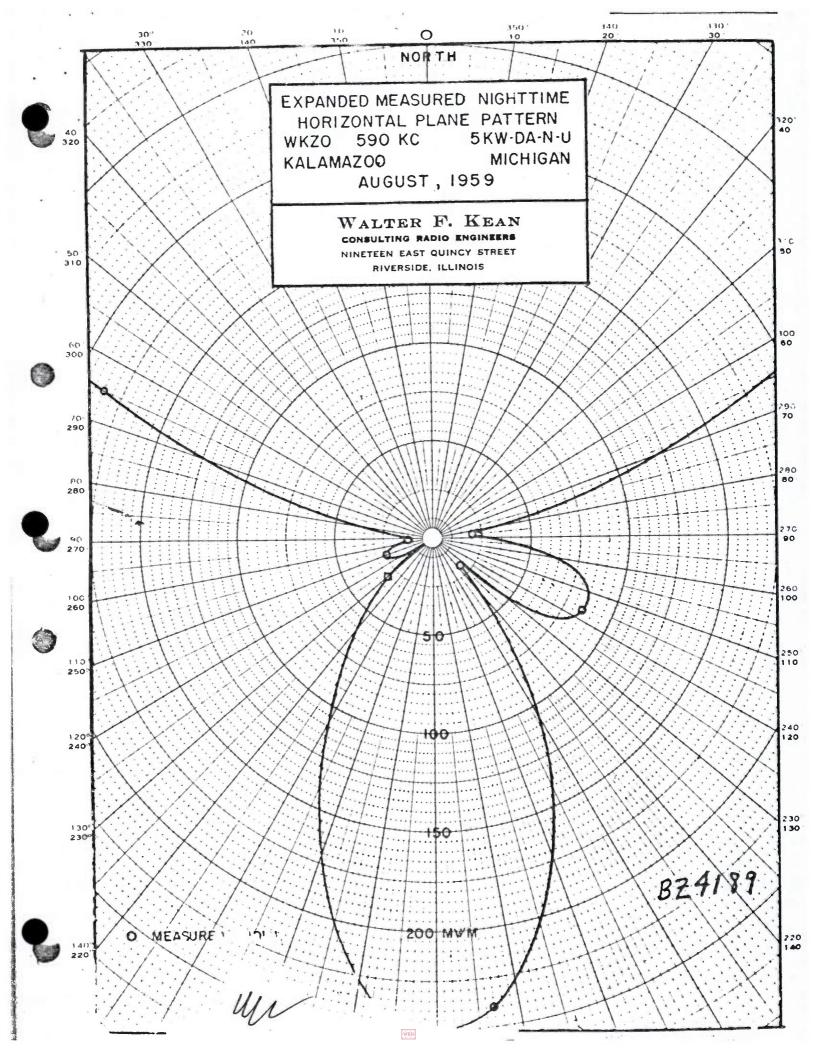
# WKZO Phasor and Transmitter Replacement Sometime near or after July 1958

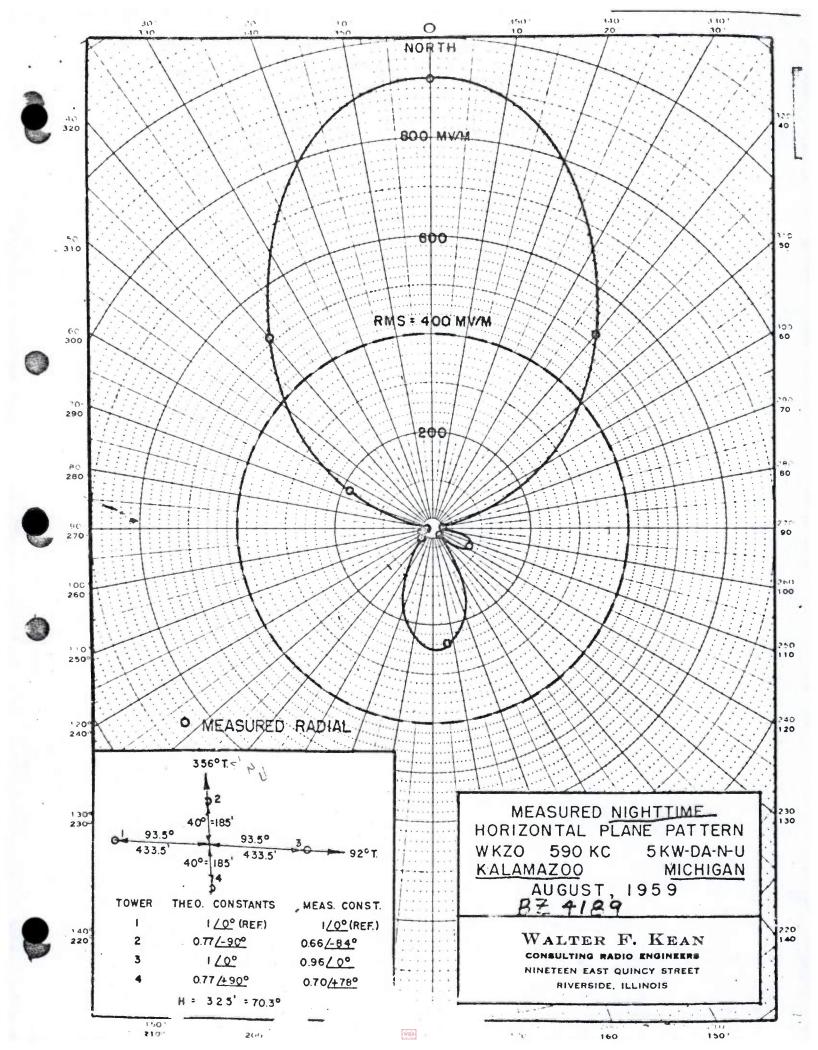
Sometime near the end of 1958 WKZO replaced the phasing and coupling equipment. The phasor was designed by RCA and is the phasor in use at WKZO currently. I have no proof but have to believe that the RCA 5DX was retired to backup service at the same time and a new RCA transmitter was purchased as the main. About this time the FCC allowed stations to run super-modulation with 125% positive peaks. The old RCA 5DX was not capable of anything close to that and if pushed the smoke would leak out of the modulation transformer. A new transmitter was required to stay competitive. The RCA phasor in question is the phasor in the photograph of the 5L Ampliphase I sent you earlier via e-mail.

A new directional antenna proof was conducted by Walter F. Kean a consultant from XXX and is the last full proof on record at the FCC.









#### **Miscellaneous Stuff**

The following pile of stuff is the FCC record with some corrections. Fairfield was not the applicant for every action since the FCC started putting that data on the FCC website.

Also, there are several pages of data from some Michigan Radio websites that mentioned Fetzer. Accuracy of the information is open to interpretation, but I thought you might find some of the data interesting.

We can't talk about Fetzer without saying something about WJEF-FM, the highest powered FM station in country.

**Application Details** Page 1 of 1



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# **Application Search Details** LAST PAOSE

File Number:

BL-

Call Sign:

**WKZO** 

Facility Id:

54485

FRN:

**Applicant Name:** 

Frequency:

590

Channel:

**Community of** 

License:

KALAMAZOO, MI

fATZEL

**Application Type:** 

LICENSE TO COVER

Status:

**GRANTED** 

**Status Date:** 

**Expiration Date:** 

**Tolling Code:** 

**Application** 

AM

Service:

Disposed Date:

**Accepted Date:** 

**Last Public Notice:** 

**Last Report** 

Number:

**Authorization** 

Authorization not available

**Legal Actions** 

View Legal Actions

**PN Comment** 

**Public Notice Comment** 

URONU



Help | Home

### **Application Search Details**

File Number:

BR-19790524YJ

Call Sign:

**WKZO** 

Facility Id:

54485

FRN:

**Applicant Name:** 

FAIRFIELD BROADCASTING COMPANY

FATEZA

Frequency:

590

Channel:

**Community of** 

KALAMAZOO, MI

License:

**Application Type:** 

RENEWAL

Status:

GRANTED

Status Date:

09/21/1979

**Expiration Date:** 

**Tolling Code:** 

**Application** 

**AM** 

Service:

**Disposed Date:** 

09/21/1979

**Accepted Date:** 

05/24/1979

**Last Public Notice:** 

10/16/1979

Last Report

40077

Number:

**Authorization** 

Authorization not available

**Legal Actions** 

View Legal Actions

**PN Comment** 

**Public Notice Comment** 

Application Details Page 1 of 1



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J. Roal

#### **Application Search Details**

File Number: BR-19820526WD

Call Sign: WKZO Facility Id: 54485

FRN:

Applicant Name: FAIRFIELD BROADCASTING COMPANY

FATEZL

Frequency: 590

Channel:

**Community of** 

License:

KALAMAZOO, MI

Application Type: RENEWAL Status: GRANTED 09/15/1982

**Expiration Date:** 

**Tolling Code:** 

**Application** AM

Service:

 Disposed Date:
 09/15/1982

 Accepted Date:
 05/26/1982

 Last Public Notice:
 09/21/1982

Last Report

Number:

40587

Authorization Authorization not available

Legal Actions View Legal Actions

PN Comment Public Notice Comment

Wholing

FRITZLA BENT CO.

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#### **Application Search Details**

**File Number:** 

BAL-19841207HD

Call Sign:

**WKZO** 

Facility Id:

54485

FRN:

**Applicant Name:** 

FAIRFIELD BROADCASTING COMPANY

Frequency:

590

Channel:

**Community of** 

KALAMAZOO, MI

License:

**ASSIGNMENT OF LICENSE** 

Status:

GRANTED

Consummation

**Application Type:** 

07/09/1985

Date:

Status Date:

12/13/1984

**Expiration Date:** 

**Tolling Code:** 

**Application** 

**AM** 

Service:

**Disposed Date:** 

12/13/1984

**Accepted Date:** 

12/11/1984

**Last Public Notice:** 

12/14/1984

**Last Report** 

41107

Number:

**Authorization** 

**View Authorization** 

**Legal Actions** 

View Legal Actions

**Positional Interest** 

Info

View Positional Interest Info

**PN Comment** 

**Public Notice Comment** 

#### UNITED STATES OF AMERICA FEDERAL COMMUNICATIONS COMMISSION WASHINGTON, D.C. 20554

	(FOR CHIEF, AUDIO DIVISION, MEDIA BUREAU)  DATE: 12/13/1984		
X CONSENT TO ASSIGNMENT:  CONSENT TO TRANSFER:		FROM:	
		TO:	
Licensee/Permittee: (for transfer only)			

AUXILIARY STATIONS

ALL CURRENTLY AUTHORIZED AUXILIARY STATIONS

Under authority of the Communications Act of 1934, as amended, the consent of the Federal Communications Commission is hereby granted to the transaction indicated above.

The Commission's consent to the above is based on the representations made by the applicants that the statements contained in, or made in connection with, the application are true and that the undertakings of the parties upon which this transaction is authorized will be carried out in good faith.

The actual consummation of voluntary transactions shall be completed within 90 days from the date hereof, and notice in letter form thereof shall promptly be furnished to the Commission by the buyer showing the date the acts necessary to effect the transaction were completed. Upon furnishing the Commission with such written notice, this transaction will be considered completed for all purposes related to the above described station(s).

FCC Form 323, Ownership Report, must be filed within 30 days after consummation, by the licensee/permittee or assignee.

ADDITIONAL REQUIREMENTS FOR ASSIGNMENTS ONLY:

Upon consummation the assignor must deliver the permit/license, including any modifications thereof to the assignee.

It is hereby directed that, upon consummation, a copy of this consent be posted with the station authorization(s) as required by the Commission's Rules and Regulations.

The assignee is not authorized to construct nor operate said station(s) unless and until notification of consummation in letter form has been forwarded to the Commission.

Public Notice Comment Page 1 of 1



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#### **Public Notice Comment**

BAL- VOL AL FROM FETZER BCNG CO. TO FETZER BROADCASTING

19841207HD SERVICE,

INC. FORM 316 AUX ATTY: EARL R. STANLEY

ASSIGNEE'S ADDRESS: 590 WEST MAPLE ST, KALAMAZOO, MI 49008



Help | Home

## **Application Search Details**

File Number:

BTC-19850731HP

Call Sign:

**WKZO** 

Facility Id:

54485

FRN:

**Applicant Name:** 

FAIRFIELD BROADCASTING COMPAN

Frequency:

590

Channel:

**Community of** 

License:

KALAMAZOO, MI

**Application Type:** 

TRANSFER OF CONTROL

Status:

GRANTED

Consummation

12/12/1985

Date:

**Status Date:** 

09/18/1985

**Expiration Date:** 

**Tolling Code:** 

**Application** 

**AM** 

Service:

**Disposed Date:** 

09/18/1985

**Accepted Date:** 

08/01/1985

**Last Public Notice:** 

09/19/1985

**Last Report** 

Number:

41289

**Authorization** 

**View Authorization** 

**Legal Actions** 

**View Legal Actions** 

**Positional Interest** 

View Positional Interest Info

Info

**PN Comment** 

**Public Notice Comment** 

frizal to lis

March

#### UNITED STATES OF AMERICA FEDERAL COMMUNICATIONS COMMISSION WASHINGTON, D.C. 20554

	(FOR CHIEF	, AUDIO DIVISION, MEDIA BUREAU)
CONSENT TO ASSIGNMENT:		FROM:
		TO:
Licensee/Permittee: FAIRFIELD BROADCASTING COMPANY (for transfer only)		

AUXILIARY STATIONS

ALL CURRENTLY AUTHORIZED AUXILIARY STATIONS

Under authority of the Communications Act of 1934, as amended, the consent of the Federal Communications Commission is hereby granted to the transaction indicated above.

The Commission's consent to the above is based on the representations made by the applicants that the statements contained in, or made in connection with, the application are true and that the undertakings of the parties upon which this transaction is authorized will be carried out in good faith.

The actual consummation of voluntary transactions shall be completed within 90 days from the date hereof, and notice in letter form thereof shall promptly be furnished to the Commission by the buyer showing the date the acts necessary to effect the transaction were completed. Upon furnishing the Commission with such written notice, this transaction will be considered completed for all purposes related to the above described station(s).

Public Notice Comment Page 1 of 1

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## **Public Notice Comment**

BTC-19850731HP VOL TC FROM FETZER BROADCASTING COMPANY TO CARL E. LEE FORM 315 ATTY: EARL R. STANLEY

Application Details Page 1 of 1



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LAK

#### **Application Search Details**

File Number: BR-19890524UE

Call Sign: WKZO Facility Id: 54485

FRN:

Applicant Name: FAIRFIELD BROADCASTING COMPANY

Frequency: 590

Channel:

**Community of** 

License:

KALAMAZOO, MI

Application Type: RENEWAL
Status: GRANTED
Status Date: 09/28/1989

**Expiration Date:** 

**Tolling Code:** 

**Application** AM

Service:

 Disposed Date:
 09/28/1989

 Accepted Date:
 05/24/1989

 Last Public Notice:
 09/28/1989

Last Report

Number:

42200

Authorization Authorization not available

Legal Actions View Legal Actions

PN Comment Public Notice Comment



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## **Application Search Details**

File Number:

BAL-19920225HC

Call Sign:

**WKZO** 

Facility Id:

54485

FRN:

**Applicant Name:** 

FAIRFIELD BROADCASTING COMPANY

1,42

Frequency:

590

Channel:

**Community of** License:

KALAMAZOO, MI

**Application Type:** 

ASSIGNMENT OF LICENSE

GRANTED

RADIO ASSO GO MICH.

Status:

Consummation

06/01/1992

Date:

Status Date:

04/15/1992

**Expiration Date:** 

**Tolling Code:** 

**Application** 

**AM** 

Service:

**Disposed Date:** 04/15/1992

**Accepted Date:** 

02/25/1992

**Last Public Notice:** 

04/22/1992

**Last Report** 

42802

Number:

**Authorization** 

**View Authorization** 

**Legal Actions** 

View Legal Actions

**Positional Interest** 

View Positional Interest Info

Info

**PN Comment Public Notice Comment** 

#### UNITED STATES OF AMERICA FEDERAL COMMUNICATIONS COMMISSION WASHINGTON, D.C. 20554

	OR CHIEF	, AUDIO DIVISION, MEDIA BUREAU) 5/1992
X CONSENT TO ASSIGNMENT:  CONSENT TO TRANSFER:		FROM:
		TO:
Licensee/Permittee: (for transfer only)		

AUXILIARY STATIONS

ALL CURRENTLY AUTHORIZED AUXILIARY STATIONS

Under authority of the Communications Act of 1934, as amended, the consent of the Federal Communications Commission is hereby granted to the transaction indicated above.

The Commission's consent to the above is based on the representations made by the applicants that the statements contained in, or made in connection with, the application are true and that the undertakings of the parties upon which this transaction is authorized will be carried out in good faith.

The actual consummation of voluntary transactions shall be completed within 90 days from the date hereof, and notice in letter form thereof shall promptly be furnished to the Commission by the buyer showing the date the acts necessary to effect the transaction were completed. Upon furnishing the Commission with such written notice, this transaction will be considered completed for all purposes related to the above described station(s).

FCC Form 323, Ownership Report, must be filed within 30 days after consummation, by the licensee/permittee or assignee.

ADDITIONAL REQUIREMENTS FOR ASSIGNMENTS ONLY:

Upon consummation the assignor must deliver the permit/license, including any modifications thereof to the assignee.

It is hereby directed that, upon consummation, a copy of this consent be posted with the station authorization(s) as required by the Commission's Rules and Regulations.

The assignee is not authorized to construct nor operate said station(s) unless and until notification of consummation in letter form has been forwarded to the Commission.

Public Notice Comment Page 1 of 1



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#### **Public Notice Comment**

BAL-19920225HC VOL AL FROM FETZER BROADCASTING SERVICE, INC. TO RADIO

ASSOCIATES OF MICHIGAN, INC. FORM 314

ATTY: EARL R. STANLEY ASNE ADDRESS: 3503 GREENLEAF

BLVD. SUITE 203, KALAMAZOO, MI. 49008

**Application Details** Page 1 of 1



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## **Application Search Details**

File Number: BTC-19950801EH

Call Sign: **WKZO** Facility Id: 54485

FRN:

KALAMAZOO, MI

TRANSFER OF CONTROL THE MILLENS

GRANTED

08/23/1905 **Applicant Name:** 

Frequency:

Channel:

Community of

License:

**Application Type:** 

Status:

Consummation

Date:

08/23/1995

Status Date: 08/23/1995

**Expiration Date:** 

**Tolling Code:** 

**Application** 

Service:

AM

08/23/1995 **Disposed Date: Accepted Date:** 08/01/1995 Last Public Notice: 08/23/1995

Last Report

43580

Number:

**Authorization View Authorization** Legal Actions View Legal Actions

**Positional Interest** 

Info

View Positional Interest Info

**PN Comment Public Notice Comment** 

### UNITED STATES OF AMERICA FEDERAL COMMUNICATIONS COMMISSION WASHINGTON, D.C. 20554

	(FOR CHIEF	, AUDIO DIVISION, MEDIA BUREAU)
CONSENT TO AS		FROM:
		TO:
Licensee/Permittee: FAIRFIELD BROADCASTING COMPANY (for transfer only)		

AUXILIARY STATIONS

ALL CURRENTLY AUTHORIZED AUXILIARY STATIONS

Under authority of the Communications Act of 1934, as amended, the consent of the Federal Communications Commission is hereby granted to the transaction indicated above.

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Public Notice Comment Page 1 of 1



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## **Public Notice Comment**

BTC-19950801EH VOLTC OF RADIO ASSOCIATES OF MICHIGAN, INC. FROM ROBERT M.

SALMON, KENNETH V. MILLER AND JERRY L. MILLER TO KENNETH V. MILLER AND JERRY L. MILLER FORM 316 ATTY. DAVID TILLOTSON

70



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# **Application Search Details**

File Number:

BAL-19950905ED

Call Sign:

**WKZO** 

Facility Id:

54485

FRN:

**Applicant Name:** 

FAIRFIELD BROADCASTING COMPANY

Frequency:

590

**Channel:** 

**Community of** 

KALAMAZOO, MI

License:

**Application Type:** 

RATIO ASSO ; ASSIGNMENT OF LICENSE

Status:

GRANTED

Consummation

11/14/1995

Date:

Status Date:

11/08/1995

**Expiration Date:** 

**Tolling Code:** 

**Application** 

**AM** 

Service:

**Disposed Date:** 

11/08/1995

**Accepted Date:** 

09/05/1995

**Last Public Notice:** 

11/08/1995

**Last Report** 

43632

Number:

**Authorization** 

**View Authorization** 

**Legal Actions** 

View Legal Actions

**Positional Interest** 

Info

View Positional Interest Info

**PN Comment** 

**Public Notice Comment** 

## UNITED STATES OF AMERICA FEDERAL COMMUNICATIONS COMMISSION WASHINGTON, D.C. 20554

	(FOR CHIEF	08/1995
X CONSENT TO AS		FROM:
		TO:
Licensee/Permitt (for transfer or		

AUXILIARY STATIONS

ALL CURRENTLY AUTHORIZED AUXILIARY STATIONS

Under authority of the Communications Act of 1934, as amended, the consent of the Federal Communications Commission is hereby granted to the transaction indicated above.

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FCC Form 323, Ownership Report, must be filed within 30 days after consummation, by the licensee/permittee or assignee.

ADDITIONAL REQUIREMENTS FOR ASSIGNMENTS ONLY:

Upon consummation the assignor must deliver the permit/license, including any modifications thereof to the assignee.

It is hereby directed that, upon consummation, a copy of this consent be posted with the station authorization(s) as required by the Commission's Rules and Regulations.

The assignee is not authorized to construct nor operate said station(s) unless and until notification of consummation in letter form has been forwarded to the Commission.

Public Notice Comment Page 1 of 1



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## **Public Notice Comment**

BAL-19950905ED VOL. AL FROM RADIO ASSOCIATES OF MICHIGAN TO FAIRFIELD BROADCASTING COMPANY AUX. FORM 314 ATTY: DAVID TILLOTSON, (ASNE) ADDRESS: 4200 WEST MAIN STREET, KALAMAZOO, MI 49007

Application Details Page 1 of 1



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## **Application Search Details**

File Number: BR-19960530WM

Call Sign: WKZO Facility Id: 54485

FRN:

**Applicant Name:** FAIRFIELD BROADCASTING COMPANY

Frequency: 590

Channel:

Community of

KALAMAZOO, MI

License:

Application Type: RENEWAL
Status: GRANTED
Status Date: 11/06/1996

**Expiration Date:** 

**Tolling Code:** 

**Application** AM

Service:

 Disposed Date:
 11/06/1996

 Accepted Date:
 05/30/1996

 Last Public Notice:
 11/06/1996

Last Report

43865

Number:

Authorization <u>View Authorization</u>

Legal Actions <u>View Legal Actions</u>

PN Comment Public Notice Comment

### LICENSE RENEWAL AUTHORIZATION

THIS IS TO NOTIFY YOU THAT YOUR APPLICATION FOR RENEWAL OF LICENSE, BR-19960530WM, WAS GRANTED ON 11/06/1996 FOR A TERM EXPIRING ON 10/01/2004.

THIS IS YOUR LICENSE RENEWAL AUTHORIZATION FOR STATION WKZO.

FACILITY ID: 54485

LOCATION: KALAMAZOO, MI

THIS CARD MUST BE POSTED WITH THE STATION'S LICENSE CERTIFICATE AND ANY SUBSEQUENT MODIFICATIONS.

FAIRFIELD BROADCASTING COMPANY 4200 W. MAIN ST KALAMAZOO, MI 49006

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# **Legal Action Information**

File Number:

BR-19960530WM

**Legal Comments** 

**Comments:** 

09/03/1996 FHODGE: PETITION TO DENY: PETITION TO DENY

FLD BY: NATIONAL RAINBOW COALITION

10/03/1996 EROBINSO: RESPONSIVE PLEADING: OPPOSITION

TO PETITION TO DENY FILED BY "CV RADIO"

**Legal Actions** 

(none)

Public Notice Comment Page 1 of 1



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## **Public Notice Comment**

BR-19960530WM RENEWAL OF LICENSE; PET. TO DENY FLD ON: 9/3/96

PETITION TO DENY DISMISSED BY LETTER 1800C2-KB 9/19/96

Application Details Page 1 of 1



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## **Application Search Details**

File Number:

BR-20040528ASB

Call Sign:

**WKZO** 

Facility Id:

54485

FRN:

0009035759

**Applicant Name:** 

FAIRFIELD BROADCASTING COMPANY

Frequency:

590

Channel:

**Community of** 

License:

KALAMAZOO, MI

License:

Application Type:

RENEWAL

Status:

**GRANTED** 

**Status Date:** 

09/20/2004

**Expiration Date:** 

**Tolling Code:** 

**Application** 

AM

Service:

**Disposed Date:** 

09/20/2004

**Accepted Date:** 

06/01/2004

**Last Public Notice:** 

09/23/2004

Last Report

45826

Number:

**Authorization** 

**View Authorization** 

**Legal Actions** 

View Legal Actions

**PN Comment** 

**Public Notice Comment** 

#### LICENSE RENEWAL AUTHORIZATION

THIS IS TO NOTIFY YOU THAT YOUR APPLICATION FOR RENEWAL OF LICENSE, BR-20040528ASB, WAS GRANTED ON 09/20/2004 FOR A TERM EXPIRING ON 10/01/2012.

THIS IS YOUR LICENSE RENEWAL AUTHORIZATION FOR STATION WKZO.

FACILITY ID: 54485

LOCATION: KALAMAZOO, MI

THIS CARD MUST BE POSTED WITH THE STATION'S LICENSE CERTIFICATE AND ANY SUBSEQUENT MODIFICATIONS.

FAIRFIELD BROADCASTING COMPANY 4200 W. MAIN ST KALAMAZOO, MI 49006

Federal Communications Commission Washington, D.C. 20554	Approved by OM 3060-0110 (July 2004	B FOR FCC USE ONLY
FCC 303-S	5	
APPLICATION FOR R BROADCAST STATIO		FOR COMMISSION USE ONLY FILE NO. BR - 20040528ASB
Read INSTRUCTIONS Before	Filling Out Form	

Legal Name of the Applicant FAIRFIELD BROADCASTING COMPANY					
Mailing Address 4200 WEST MAIN	Mailing Address				
City KALAMAZOO		State or Country (if foreign address) MI	ZIP Code 49006 -		
Telephone Number (include at 2693457121	Telephone Number (include area code) 2693457121		ss (if available)		
FCC Registration Number: 0009035759	Call Sign WKZO	Facility Identifier 54485			
Contact Representative (if other than Applicant) DAVID TILLOTSON		Firm or Company Name LAW OFFICE OF DAVID TILLOTSON			
	Mailing Address 4606 CHARLESTON TERRACE, N.W.				
City WASHINGTON	State or Country (if foreign address) DC	Zip Code 20007 -			
Telephone Number (include area code) 2026256241		E-Mail Address (if available) DTLAW@STARPOWER.NET			
3. If this application has been submitted without a fee, indicate reason for fee exemption (s 1.1114):  C Governmental Entity C Noncommercial Educational Licensee C Other		nption (see 47 C.F.R. Section			
4. Purpose of Application  • Renewal of license  • Amendment to pending renewal application					
			the [Exhibit 1]		
Facility Information: © Con	nmercial C Noncommercial Edu	ıcational			
Service and Community of L a. • AM • FM • TV • C • TV Translator • Low					

		Community of Licen	se /Area to be Served		
		City: KALAMAZOO	State : MI		
b.		Does this application include one or more FM translator station(s), or TV translator station(s), LPTV station(s), in addition to the station listed in Section I question 1? (The callsign(s) of any associated FM translators, TV translators or LPTVs will be requested in Section V).			C Yes © No
7.	01	her Authorizations. List call sign	s, facility identifiers and location	s) of any FM	[Exhibit 2]
	bo	oster or TV booster station(s) for v	which renewal of license is also re	quested.	

## **Section II - Legal - TO BE COMPLETED BY ALL APPLICANTS**

2	Certification. Licensee certifies that it has answered each question in this application based on its review of the application instructions and worksheets. Licensee further certifies that where it has made an affirmative certification below, this certification constitutes its representation that the application satisfies each of the pertinent standards and criteria set forth in the application, instructions and worksheets.  Character Issues. Licensee certifies that the neither the licensee nor any party to the application.	
۷.	had any interest in, or connection with:	opineation has of has
	a. any broadcast application in any proceeding where character issues were left unresolved or were resolved adversely against the applicant or party to the application; or	• Yes • No See Explanation in [Exhibit 3]
	b. any pending broadcast application in which character issues have been raised.	• Yes C No See Explanation in [Exhibit 4]
3.	Adverse Findings. Licensee certifies that, with respect to the licensee and each party to the application, no adverse finding has been made, nor has an adverse final action been taken by any court or administrative body in a civil or criminal proceeding brought under the provisons of any laws related to the following: any felony; mass media-related antitrust or unfair competition; fraudulent statements to another governmental unit; or discrimination.	Yes No See Explanation in [Exhibit 5]
4.	FCC Violations during the Preceding License Term. Licensee certifies that, with respect to the station(s) for which renewal is requested, there have been no violations by the licensee of the Communications Act of 1934, as amended, or the rules or regulations of the Commission during the preceding license term. If No, the licensee must submit an explanatory exhibit providing complete descriptions of all violations.	Yes No See Explanation in [Exhibit 6]
5.	Alien Ownership and Control. Licensee certifies that it complies with the provisions of Section 310 of the Communications Act of 1934, as amended, relating to interests of aliens and foreign governments.	Fee Explanation in [Exhibit 7]
6	Anti-Drug Abuse Act Certification. Licensee certifies that neither licensee nor any	© Yes C No
	party to the application is subject to denial of federal benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. Section 862.	103 140

I certify that the statements in this application are true, complete, and correct to the best of my knowledge and belief, and are made in good faith. I acknowledge that all certifications and attached Exhibits are considered material representations. I hereby waive any claim to the use of any particular frequency as against the regulatory power of the United States because of the previous use of the same, whether by license or otherwise,

CDBS Print Page 3 of 4

and request an authorization in accordance with this application. (See Section 304 of the Communications Act of 1934, as amended.)

Typed or Printed Name of Person Signing STEPHEN C. TRIVERS	Typed or Printed Title of Person Signing PRESIDENT
Signature	Date 05/28/2004

WILLFUL FALSE STATEMENTS ON THIS FORM ARE PUNISHABLE BY FINE AND/OR IMPRISONMENT (U.S. CODE, TITLE 18, SECTION 1001), AND/OR REVOCATION OF ANY STATION LICENSE OR CONSTRUCTION PERMIT (U.S. CODE, TITLE 47, SECTION 312(a)(1)), AND/OR FORFEITURE (U.S. CODE, TITLE 47, SECTION 503).

### FCC NOTICE TO INDIVIDUALS REQUIRED BY THE PRIVACY ACT AND THE PAPERWORK REDUCTION ACT

The FCC is authorized under the Communications Act of 1934, as amended, to collect the personal information we request in this report. We will use the information you provide to determine if the benefit requested is consistent with the public interest. If we believe there may be a violation or potential violation of a FCC statute, regulation, rule or order, your request may be referred to the Federal, state or local agency responsible for investigating, prosecuting, enforcing or implementing the statute, rule, regulation or order. In certain cases, the information in your request may be disclosed to the Department of Justice or a court or adjudicative body when (a) the FCC; or (b) any employee of the FCC; or (c) the United States Government, is a party to a proceeding before the body or has an interest in the proceeding. In addition, all information provided in this form will be available for public inspection. If you owe a past due debt to the federal government, any information you provide may also be disclosed to the Department of Treasury Financial Management Service, other federal agencies and/or your employer to offset your salary, IRS tax refund or other payments to collect that debt. The FCC may also provide this information to these agencies through the matching of computer records when authorized. If you do not provide the informtion requested on this report, the report may be returnd without action having been taken upon it or its processing may be delayed while a request is made to provide the missing information. Your response is required to obtain the requested authority. We have estimated that each response to this collection of information will average 3 hours. Our estimate includes the time to read the instructions, look through existing records, gather and maintain required data, and actually complete and review the form or response. If you have any comments on this estimate, or on how we can improve the collection and reduce the burden it causes you, please write the Federal Communications Commission, AMD-PERM, Paperwork Reduction Project (3060-0110), Washington, D. C. 20554. We will also accept your comments via the Internet if you send them to Leslie. Smith@fcc.gov, Remember - you are not required to respond to a collection of information sponsored by the Federal government, and the government may not conduct or sponsor this collection, unless it displays a currently valid OMB control number or if we fail to provide you with this notice. This collection has been assigned an OMB control number of 3060-0110.

THE FOREGOING NOTICE IS REQUIRED BY THE PRIVACY ACT OF 1974, P.L. 93-579, DECEMBER 31, 1974, 5 U.S.C. 552a(e)(3), AND THE PAPERWORK REDUCTION ACT OF 1995, P.L. 104-13, OCTOBER 1, 1995, 44 U.S.C. 3507.

#### Section III - TO BE COMPLETED BY AM and FM LICENSEES ONLY

1	F	Biennial Ownership Report: Licensee certifies that the station's Biennial Ownership Report (FCC Form 323 or 323-E) has been filed with the Commission as required by	∘ Yes C No
		7 C.F.R. Section 73.3615.	See Explanation in [Exhibit 8]
2	. I	EEO Program: Licensee certifies that:	
		The station's Broadcast EEO Program Report (FCC Form 396) has been filed with the Commission, as required by 47 C.F.R. Section 73.2080(f)(1).	© Yes C No
		Specify FCC Form 396 File Number: B396 - 20040528ARK	See Explanation in [Exhibit 9]
		The station has posted its most recent Broadcast EEO Public File Report on the station's website, as required by 47 C.F.R. Section 73.2080(c)(6).	© Yes C No C N/A
			See Explanation in

	[Exhibit 10]
3. Local Public File. Licensee certifies that the documentation, required by 47 C.F.R Section 73.3526 or 73.3527, as applicable, has been placed in the station's public	. • Yes C No
inspection file at the appropriate times.	See Explanation in [Exhibit 11]
4. <b>Discontinued Operations.</b> Licensee certifies that during the preceding license term the station has not been silent for any consecutive 12-month period.	n, e Yes C No
	See Explanation in [Exhibit 12]
5. Silent Station Licensee certifies that the station is currently on the air broadcasting programming intended to be received by the public.	Yes C No
6. Environmental Effects. Licensee certifies that the specified facility complies with the maximum permissible radiofrequency electromagnetic exposure limits for controlled and uncontrolled environments. Unless the licensee can determine compliance through the use of the RF worksheets in the Instructions to this Form, a Exhibit is required.	
By checking "Yes" above, the licensee also certifies that it, in coordination with other users of the site, will reduce power or cease operation as necessary to protect person having access to the site, tower, or antenna from radiofrequency electromagnetic exposure in excess of FCC guidelines.	

# Exhibits