



Comprehensive Engineering Statement – March 11, 2024

Penn-Jersey Educational Radio Corporation

This proposal is for a minor change to the construction permit 0000160326 for non-commercial educational FM station WPNJ that serves Harmony, New Jersey. The station proposes to reduce antenna height and compensate with a slight increase in ERP using equivalence with the 60 dBu service contours. No change to the geographic coordinates of the transmitter is proposed.

Geographic Coordinates: N. Lat. 40-46-14.30, W. Long. 75-03-50.60 (NAD 83)

Channel number: 214, 90.7 Mhz.

Proposed antenna center of radiation is 401 m AMSL, HAAT: 233.5 m. (8 cardinal radials, FCC 30-meter terrain data.)

Antenna height COR above ground, 26 m.

Base elevation at the site, 375 m.

Tower height above ground, 38 m, (existing tower.)

Antenna Type, SWR FMEV 1-bay

ERP, 0.056 kW V, 0.001 kW H

Pages #2 and #3 are contour-to-contour channel studies using our FMCommander program. These studies employ the highly accurate FCC 30-meter terrain elevation database to show that the existing CP and the proposed modification produce essentially identical protected and interference signal contours. Page #4 is a contour-to-contour map showing the continuation of the protections to WHYY-FM in Philadelphia. The continued protection to WPVI-TV, also in Philadelphia, is unchanged.

Page #5 is a coverage map showing the 60 dBu city service contour of the proposed facilities. Both the extant CP and the proposed 60 dBu service contour occupy the same space resulting in the appearance of a single contour on the map. The city of Harmony continues to be fully covered by the proposed change.

Page #6 shows the proposed azimuth pattern and table of fields and power along ten-degree azimuths. These remain unchanged from the CP.

The proposed antenna produces a power density well below the Commission's maximum for this uncontrolled area. Using the standard OET 65 formulas without adjustment for the vertical elevation field, with the calculation at head-height from the antenna at 26 meters above ground, a total of 3.306 $\mu\text{W}/\text{cm}^2$ is predicted which is 1.65 percent of the maximum of 200 $\mu\text{W}/\text{cm}^2$ for the uncontrolled area. The tower site is also the location of translator W222BV transmitting with an ERP of 0.01 kW H&V. This facility produces 0.794 $\mu\text{W}/\text{cm}^2$ at head level that is 0.397 percent of the maximum. Together both facilities produce 2.05% of the maximum. The applicant proposes to use an existing tower that has not been the target of environmental objections. There will be no changes to the tower height or other changes that may call for a detailed environmental analysis. The applicant will reduce power or terminate transmissions as necessary to protect the public and workers on the tower. Other than the two mentioned broadcast facilities, there are no others producing such radio energy on the tower.

Page #7 is an exhibit stating the qualifications of the preparer.

Doug Vernier Telecommunications Consultants

Proposed Contour-to-Contour Study											
Penn-Jersey Educational Radio											
REFERENCE	CH#	214A	-	90.7	MHz, Pwr= 0.056 kW	DA, HAAT= 233.5 M,	COR= 401 M	DISPLAY DATES			
40 46 14.30 N.	Average Protected F(50-50)= 13.59 km						DATA 03-10-24				
75 03 50.60 W.	Standard Directional						SEARCH 03-10-24				
CH	CALL	TYPE	ANT	AZI	DIST	LAT	PWR (kW)	INT (km)	PRO (km)	*IN*	*OUT*
CITY		STATE		<--	FILE #	LNG	HAAT (M)	COR (M)	LICENSEE	(Overlap	in km)
6	-- WPVI-TV-A	CHA	D_Y	190.6	82.33	40 02 33.40	34.000	2.3	0.0	2.3R	80.0M
Philadelphia		PA		10.5	DTVBL8616	75 14 31.66	330	395			
06 1C	WPVI-TV	LI	_CY	190.5	82.13	40 02 39.00	45.000	2.3	0.0	2.3R	79.8M
Philadelphia		PA		10.4	0000218393	75 14 25.01	342	409			
214A	WPNJ	CP	DEN	0.0	0.00	40 46 14.30	0.051		---Reference---		
Harmony Township		NJ		0.0	0000160326	75 03 50.60	246	412	Penn-Jersey Educational Ra		
213A	WPNJ	LIC	DEN	252.7	17.10	40 43 29.30	0.750		---Reference---		
Easton		PA		72.6	BLED20130104ABV	75 15 28.60	-16	136	Penn-Jersey Educational Ra		
215B	WHYY-FM	LIC	_CN	190.5	82.38	40 02 30.40	13.500	75.9	51.6	0.5	21.9
Philadelphia		PA		10.3	BMLED20040817AAX	75 14 22.60	280	347	Whyy, Inc.		
213A	WCVH	LIC	_CN	150.4	27.29	40 33 25.30	0.078	14.5	10.4	4.3	4.9
Flemington		NJ		330.5	BLED19900808KA	74 54 16.60	137	244	Hunterdon Central H. S. Bd		
214B	WFUV	LIC	DCN	82.7	100.57	40 52 48.40	47.000	81.7	28.0	6.0	29.8
New York		NY		263.4	BMLED20091214AEF	73 52 38.50	155	179	Fordham University		
212A	WESS	LIC	_CN	340.3	26.93	40 59 55.30	1.000	1.6	10.2	11.0	16.2
East Stroudsburg		PA		160.3	BLED20150828AAE	75 10 19.60	-42	189	East Stroudsburg Universit		
217A	WLVR-FM	CP	DEN	233.2	31.24	40 36 06.20	0.220	1.0	18.0	21.7	13.1
Bethlehem		PA		53.0	0000210023	75 21 37.00	170	302	Lehigh University		
214A	WCLH	LIC	_CN	305.0	81.16	41 11 11.30	0.205	53.3	16.7	13.8	17.8
Wilkes-Barre		PA		124.5	BMLED20131212BZN	75 51 31.70	296	686	Wilkes University		
216B1	WRTY	LIC	DCN	319.1	40.33	41 02 40.30	3.500	1.0	24.9	25.4	14.9
Jackson Township		PA		138.9	BLED19910814KE	75 22 43.60	264	674	Temple University Of The C		
217A	WLVR-FM	LIC	DEN	233.0	31.20	40 36 04.30	0.200	0.7	15.0	22.0	16.0
Bethlehem		PA		52.8	BLED20151027AFJ	75 21 32.60	170	305	Lehigh University		
213A	WJSV	LIC	_CN	81.4	49.26	40 50 06.30	0.125	8.5	6.0	27.9	24.1
Morristown		NJ		261.8	BLED20150204AAN	74 29 05.50	5	159	Morris School District		
211B	WRTI	LIC	DCN	190.2	82.34	40 02 30.00	7.700	4.8	52.0	71.6	30.2
Philadelphia		PA		10.1	BLED20100927AHC	75 14 10.10	371	435	Temple University Of The C		
212A	WLHI	LIC	_CN	255.5	47.64	40 39 43.30	0.420	1.4	15.7	34.7	31.6
Schnecksville		PA		75.1	BLED19931227KF	75 36 39.60	70	240	Four Rivers Community Broa		

Terrain database is FCC 30 meter , R= 73.215 qualifying spacings or FCC minimum Spacings in KM, M= Margin in KM
 Contour distances are on direct line to and from reference station. Reference zone= - ZN1, Co to 3rd adjacent.
 All separation margins (if shown) include rounding.

Ant Column: (D= DA Standard, Z= DA 73.215, N= Not DA 73.215, _= Omni), Polarization (C,H,V,E), Beamtilt (Y,N,X)
 "*"affixed to 'IN' or 'OUT' values = site inside restricted contour.

< = Station meets FCC minimum distance spacing for its class.

Doug Vernier Telecommunications Consultants

Existing WPNJ C.P. Contour-to-Contour Study
 Penn-Jersey Educational Radio
 CH# 214A - 90.7 MHz, Pwr= 0.051 kW DA, HAAT= 244.5 M, COR= 412 M
 Average Protected F(50-50)= 13.59 km
 Standard Directional

REFERENCE
 40 46 14.30 N.
 75 03 50.60 W.

DISPLAY DATES
 DATA 03-10-24
 SEARCH 03-10-24

CH CITY	CALL	TYPE STATE	ANT	AZI <--	DIST FILE #	LAT LNG	PWR (kW) HAAT (M)	INT (km) COR (M)	PRO (km) LICENSEE	*IN* (Overlap	*OUT* in km)
6	-- WPVI-TV-A Philadelphia	CHA D_Y PA		190.6 10.5	82.33 DTVBL8616	40 02 33.40 75 14 31.66	34.000 330	2.3 395	0.0	2.3R	80.1M
06 1C	WPVI-TV Philadelphia	LI _CY PA		190.5 10.4	82.13 0000218393	40 02 39.00 75 14 25.01	45.000 342	2.3 409	0.0	2.3R	79.9M
214A	WPNJ Harmony Township	CP DEN NJ		0.0 0.0	0.00 0000160326	40 46 14.30 75 03 50.60	0.051 246	412	---Reference---		Penn-Jersey Educational Ra
213A	WPNJ Easton	LIC DEN PA		252.7 72.6	17.10 BLED20130104ABV	40 43 29.30 75 15 28.60	0.750 -16	136	---Reference---		Penn-Jersey Educational Ra
215B	WHYY-FM Philadelphia	LIC _CN PA		190.5 10.3	82.38 BMLED20040817AAX	40 02 30.40 75 14 22.60	13.500 280	75.9 347	51.6 Whyy, Inc.	0.6	21.9
213A	WCVH Flemington	LIC _CN NJ		150.4 330.5	27.29 BLED19900808KA	40 33 25.30 74 54 16.60	0.078 137	14.5 244	10.4 Hunterdon Central H.	4.3 S.	5.0 Bd
214B	WFUV New York	LIC DCN NY		82.7 263.4	100.57 BMLED20091214AEF	40 52 48.40 73 52 38.50	47.000 155	81.7 179	28.0 Fordham University	6.0	29.6
212A	WESS East Stroudsburg	LIC _CN PA		340.3 160.3	26.93 BLED20150828AAE	40 59 55.30 75 10 19.60	1.000 -42	1.6 189	10.2 East Stroudsburg Universit	11.0	16.3
217A	WLVR-FM Bethlehem	CP DEN PA		233.2 53.0	31.24 0000210023	40 36 06.20 75 21 37.00	0.220 170	1.0 302	18.0 Lehigh University	21.7	13.1
214A	WCLH Wilkes-Barre	LIC _CN PA		305.0 124.5	81.16 BMLED20131212BZN	41 11 11.30 75 51 31.70	0.205 296	53.3 686	16.7 Wilkes University	13.9	17.8
216B1	WRTY Jackson Township	LIC DCN PA		319.1 138.9	40.33 BLED19910814KE	41 02 40.30 75 22 43.60	3.500 264	1.0 674	24.9 Temple University Of The C	25.4	14.9
217A	WLVR-FM Bethlehem	LIC DEN PA		233.0 52.8	31.20 BLED20151027AFJ	40 36 04.30 75 21 32.60	0.200 170	0.7 305	15.0 Lehigh University	22.0	16.0
213A	WJSV Morristown	LIC _CN NJ		81.4 261.8	49.26 BLED20150204AAN	40 50 06.30 74 29 05.50	0.125 5	8.5 159	6.0 Morris School District	27.9	24.0
211B	WRTI Philadelphia	LIC DCN PA		190.2 10.1	82.34 BLED20100927AHC	40 02 30.00 75 14 10.10	7.700 371	4.8 435	52.0 Temple University Of The C	71.6	30.2
212A	WLHI Schnecksville	LIC _CN PA		255.5 75.1	47.64 BLED19931227KF	40 39 43.30 75 36 39.60	0.420 70	1.4 240	15.7 Four Rivers Community Broa	34.7	31.6

Terrain database is FCC 30 meter , R= 73.215 qualifying spacings or FCC minimum Spacings in KM, M= Margin in KM
 Contour distances are on direct line to and from reference station. Reference zone= - ZN1, Co to 3rd adjacent.
 All separation margins (if shown) include rounding.

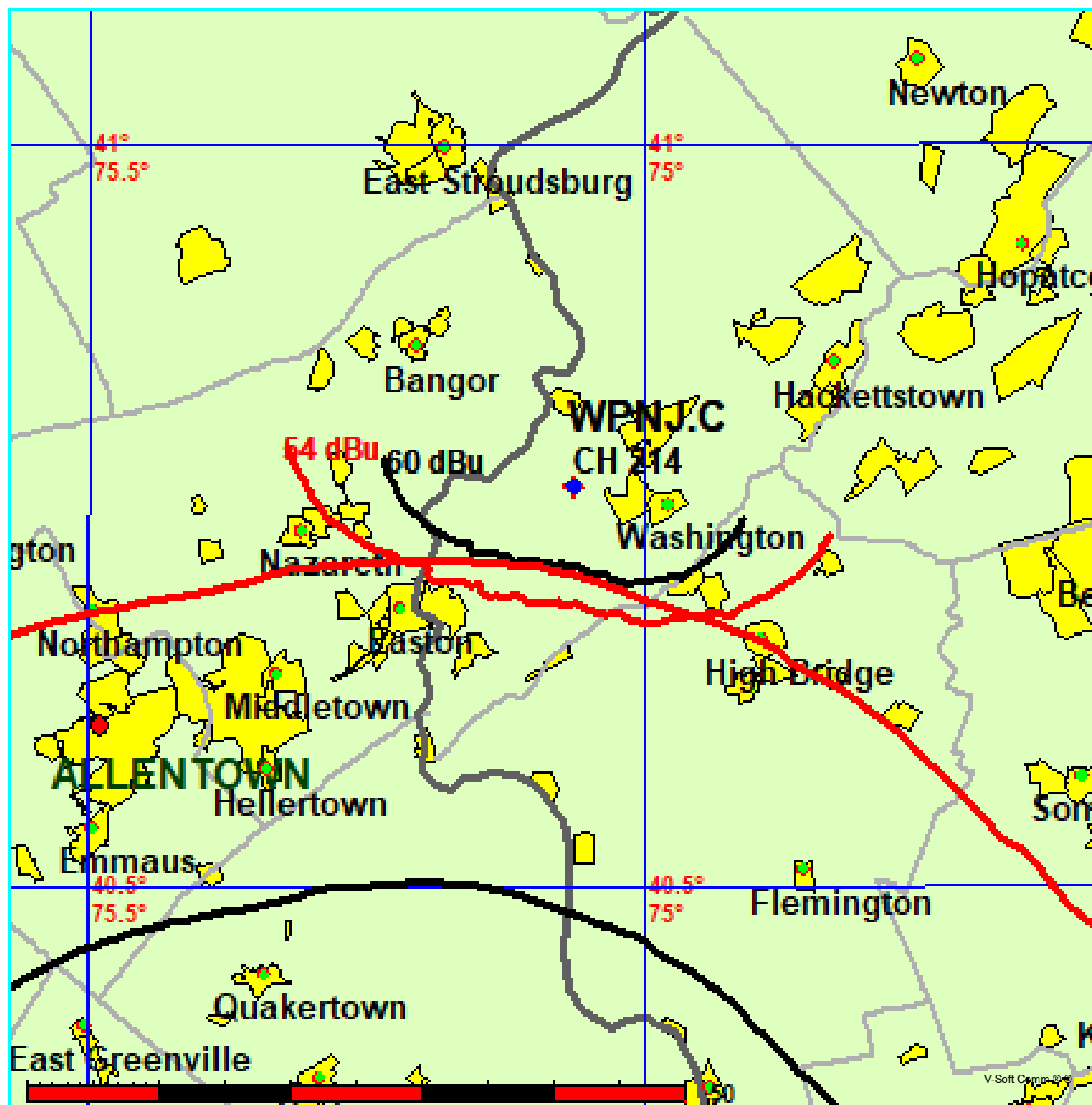
Ant Column: (D= DA Standard, Z= DA 73.215, N= Not DA 73.215, _= Omni), Polarization (C,H,V,E), Beamtilt (Y,N,X)
 ***affixed to 'IN' or 'OUT' values = site inside restricted contour.

« = Station meets FCC minimum distance spacing for its class.

FMCommander Single Allocation Study - 03-10-2024 - FCC 30 meter
WPNJ.C's Overlaps (In= 0.55 km, Out= 21.91 km)

WPNJ.C CH 214 A DA
Lat= 40 46 14.30, Lng= 75 03 50.60
0.056 kW 233.5 m HAAT, 401 m COR
Prot.= 60 dBu, Intef.= 54 dBu

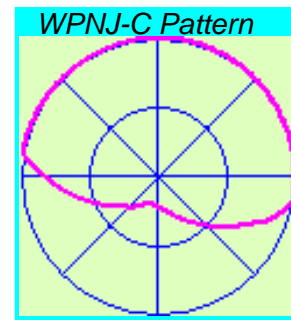
WHYY-FM CH 215 B BMLED20040817AAX
Lat= 40 02 30.40, Lng= 75 14 22.60
13.5 kW 280 m HAAT, 347 m COR
Prot.= 60 dBu, Intef.= 54 dBu



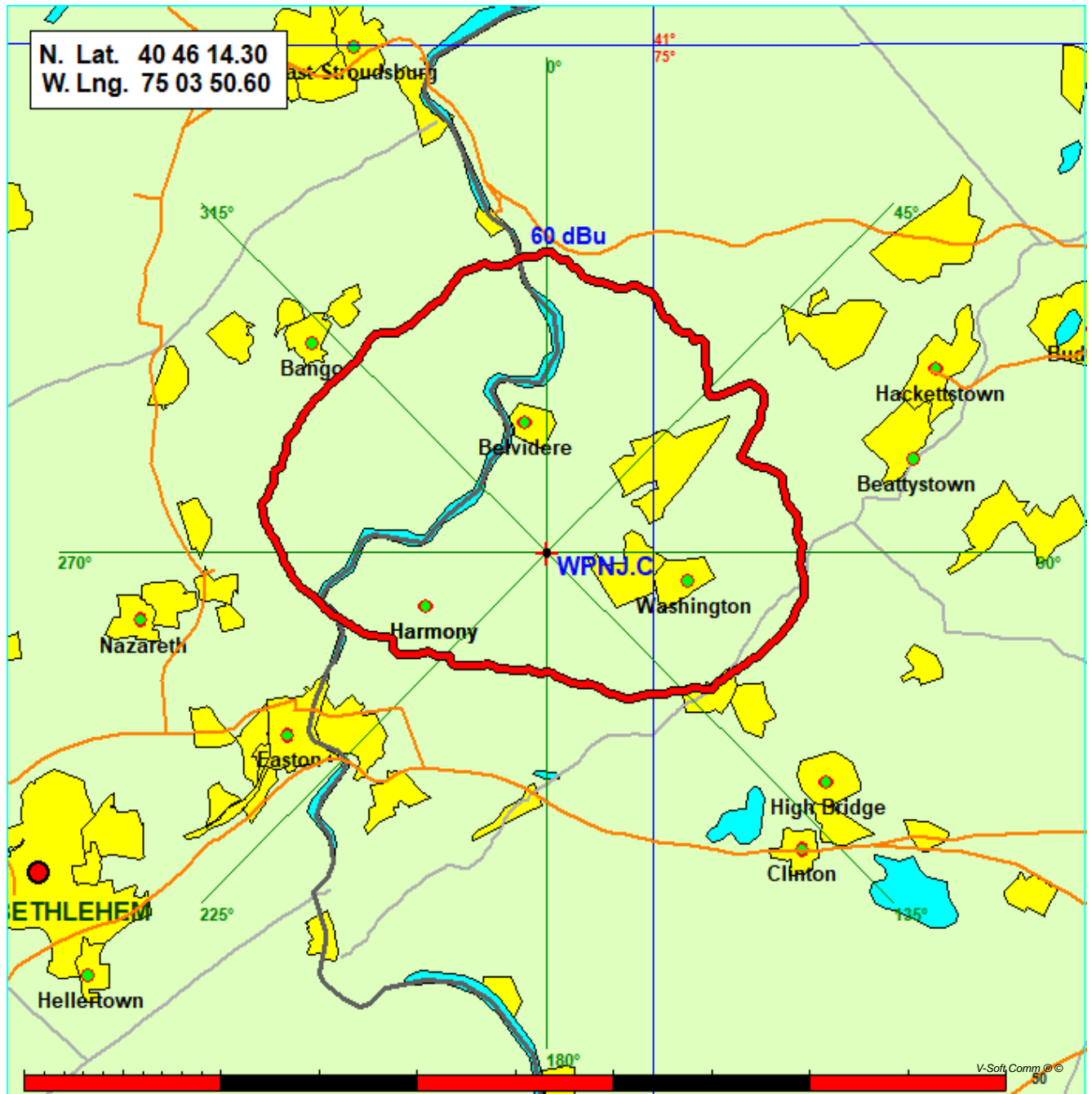
Map Shows 60 dBu of Both the CP and Proposal, Superimposed
Penn-Jersey Educational Radio

Coverage Study - FCC 30 meter
03-11-2024

WPNJ-C CH214 A , 0.056 kW, 233.5m HAAT, 401.0m COR AMSL
Service Contour = 60 dBu.



Page #5



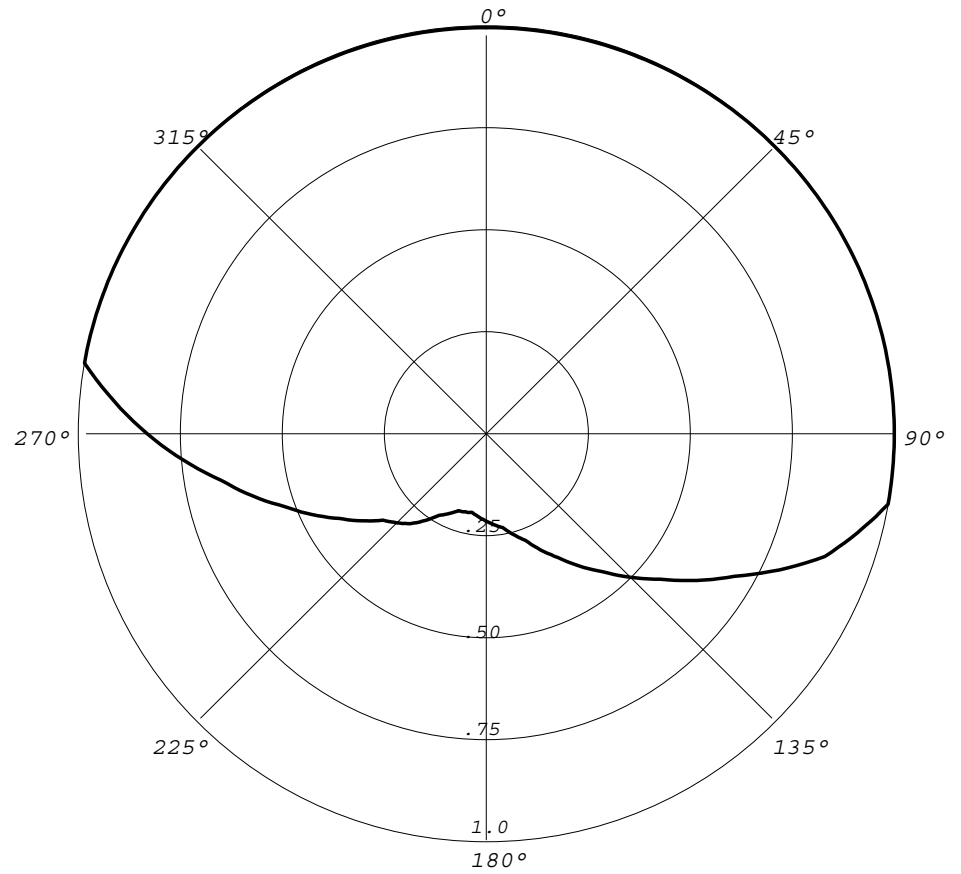
WPNJ.C

03-10-2024

RMS (V) = .798

Graph is Relative Field

<u>Azi</u>	<u>Field</u>	<u>dBk</u>	<u>kW</u>
000	1.000	-12.518	0.056
010	1.000	-12.518	0.056
020	1.000	-12.518	0.056
030	1.000	-12.518	0.056
040	1.000	-12.518	0.056
050	1.000	-12.518	0.056
060	1.000	-12.518	0.056
070	1.000	-12.518	0.056
080	1.000	-12.518	0.056
090	1.000	-12.518	0.056
100	1.000	-12.518	0.056
110	0.883	-13.599	0.044
120	0.702	-15.591	0.028
130	0.557	-17.601	0.017
140	0.443	-19.590	0.011
150	0.352	-21.587	0.007
160	0.279	-23.606	0.004
170	0.235	-25.097	0.003
180	0.215	-25.869	0.003
190	0.197	-26.629	0.002
200	0.202	-26.411	0.002
210	0.232	-25.208	0.003
220	0.289	-23.300	0.005
230	0.331	-22.122	0.006
240	0.417	-20.115	0.010
250	0.525	-18.115	0.015
260	0.660	-16.127	0.024
270	0.831	-14.126	0.039
280	1.000	-12.518	0.056
290	1.000	-12.518	0.056
300	1.000	-12.518	0.056
310	1.000	-12.518	0.056
320	1.000	-12.518	0.056
330	1.000	-12.518	0.056
340	1.000	-12.518	0.056
350	1.000	-12.518	0.056



**Declaration and
Statement of Qualifications**

I, Douglas L. Vernier, declare that I have received training as an engineer from the University of Michigan School of Engineering. That, I have received degrees from the University in the field of Broadcast Telecommunications. That, I have been active in broadcast consulting for over 40 years;

That, I have held a Federal Communications Commission First Class Radiotelephone License continually since 1964. In 1985, this license was reissued by the Commission as a lifetime General Radiotelephone license no. PG-16-16464;

That, I am certified as a Professional Broadcast Engineer (#50258) by the Society of Broadcast Engineers, Indianapolis, Indiana. (Life-time Certification received in 2010);

That, my qualifications are a matter of record with the Federal Communications Commission;

That, I have been retained by Penn-Jersey Educational Radio Corporation to prepare the engineering showing appended hereto;

That, I have prepared this broadcast engineering showing, the technical information contained in same and the facts stated within are true of my knowledge;

That, under penalty of perjury, I declare that the foregoing is correct.

Douglas L. Vernier

A handwritten signature in blue ink, appearing to read "Doug Vernier", with a large, stylized initial "D" and a horizontal line extending from the end of the signature.

Executed on March 11, 2024