

ENGINEERING STATEMENT
AUTHORIZATION TO CONSTRUCT REPACKED FACILITIES
PURSUANT TO DA 17-314
ON BEHALF OF
WLEX COMMUNICATIONS, LLC.
WLEX-DT, LEXINGTON, KENTUCKY
CHANNEL 28 379 KW (H) 113.7 KW (V) ERP MAX
286 METERS HAAT
JUNE 2017

COHEN, DIPPELL AND EVERIST, P.C.
CONSULTING ENGINEERS
RADIO AND TELEVISION
WASHINGTON, D.C.

COHEN, DIPPELL AND EVERIST, P. C.

City of Washington)
) ss
District of Columbia)

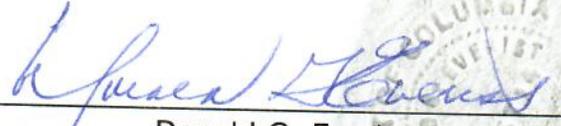
Donald G. Everist, being duly sworn upon his oath, deposes and states that:

He is a graduate electrical engineer, a Registered Professional Engineer in the District of Columbia, and is President, Secretary and Treasurer of Cohen, Dippell and Everist, P.C., Consulting Engineers, Radio - Television, with offices at 1420 N Street, N.W., Suite One, Washington, D.C. 20005;

That his qualifications are a matter of record in the Federal Communications Commission;

That the attached engineering report was prepared by him or under his supervision and direction and

That the facts stated herein are true of his own knowledge, except such facts as are stated to be on information and belief, and as to such facts he believes them to be true.



Donald G. Everist
District of Columbia
Professional Engineer
Registration No. 5714

Subscribed and sworn to before me this 30th day of June, 2017.



Notary Public

My Commission Expires: 2/28/2018



This engineering statement has been prepared on behalf of WLEX Communications, LLC, licensee of WLEX-DT, Lexington, Kentucky. The purpose of this engineering statement is to accompany its application for authorization to construct repacked digital television ("DTV") facilities.

WLEX-DT is licensed to operate on DTV television Channel 39 with a maximum visual effective radiated power ("ERP") of 475 kW (horizontal polarization) and height above average terrain ("HAAT") of 286 meters (938.5 feet). WLEX-DT has been assigned DTV Channel 28 with facilities of 379 kW ERP (maximum directional) and HAAT of 286 meters (938.3 feet). WLEX-DT requests authorization to construct DTV facilities for Channel 28 (554-560 MHz) of 379 kW (elliptical polarization) with HAAT of 286.0 meters at the existing licensed site. There are no other changes proposed.

The proposed antenna will be a panel system and will be side-mounted on an existing tower. Exhibit E-1 shows a tower sketch and the antenna arrangement on the tower.

According to the FCC engineering data base as of June 16, 2017, there are no AM stations located within 3.2 km of the existing WLEX-DT tower site and there are no FM stations within 100 meters. The tower also currently supports the licensed operation of WTVQ-TV, Channel 40, Lexington, Kentucky. WTVQ-TV will also operate from the proposed antenna on a new channel, Channel 27.

The existing transmitter site is located at 6940 Man-O-War Boulevard, Lexington, Kentucky. The tower registration number is 1044034.

The geographic coordinates of the existing tower are:

North Latitude: 38° 02' 03"

West Longitude: 84° 23' 39"

NAD 27

North Latitude: 38° 02' 03"

West Longitude: 84° 23' 39"

NAD 83

Equipment Data

Antenna: Dielectric, Type TFU-30DSC/VP-R 3S180 (or equivalent) elliptically polarized directional antenna with 0.75° electrical beam tilt. The azimuth and vertical plane patterns and other exhibits required by Section 73.625(c) are included in Exhibit E-2.

Transmission Line: 980 feet (298.7 m) of Dielectric, rigid 6-1/8", 75 ohm digit (or equivalent)

Power Data

Transmitter output ("TPO"):	15.2 kW	11.82 dBk
At filter output		

Transmission Line Efficiency/(Loss):	77.1%	(1.13 dB)
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Input power to the antenna:	11.7 kW	10.69 dB
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Antenna power gain maximum:	Horizontal 32.35	15.10 dB
	Vertical 9.70	9.87 dB

Effective Radiated Power (ERP)

Maximum, Main Lobe:	Horizontal 379 kW	25.79 dBk
	Vertical 113.7 kW	20.56 dBk

Elevation Data

Vertical dimension of Channel 28 side-mounted antenna	18 meters 59.1 feet
Elevation of site above mean sea level	305 meters 1000.7 feet
Overall height above ground of existing tower structure and appurtenances (including lightning protection)	303 meters 994.1 feet
Overall height above mean sea level of existing tower and appurtenances (including lightning protection)	608 meters 1994.8 feet
Center of radiation of Channel 28 antenna above ground	273.3 meters 896.7 feet
Center of radiation of Channel 28 antenna above mean sea level	578.3 meters 1897.3 feet
Antenna height above average terrain	286 meters 938.3 feet

NOTE: Slight height differences result due to conversion to metric.

Coverage

Utilizing the formula in Section 73.625(b)(2) of the Rules for the effective heights, it is found that the depression angle, A_h , varies from 0.46 to 0.48 degrees. Since the relative vertical field is greater than 90% of the maximum at these depression angles, the maximum power was used in determining the distance to the DTV contour.

Table 1 includes the distances to the 48 and 40.14 dBu F(50,90) coverage contour, the average elevation 3.2 to 16.1 km, and the antenna height above average terrain for each ten degrees

in azimuth commencing with N 0 ° E, T. Exhibit E-3 shows the 48 dBu and 40.14 dBu contours and the city of license. The predicted 48 dBu F(50,90) contour covers the city of license.

Other Licensed and Broadcast Facilities

No adverse technical effect is anticipated by the proposed DTV operation to any other FCC licensed facility. If required, the licensee will install filters or take other measures as necessary to resolve the problem.

FCC Rule, Section 1.1307

The proposed 379 kW operation will utilize the Dielectric, Type TFU-30DSC/VP-R 3S180 antenna (or equivalent) described above with a center of radiation above ground of 273.3 meters. The proposed antenna will be side-mounted on the existing guyed steel lattice tower with an overall height of 303 meters above ground.

As previously indicated, there are no AM stations located within 3.2 km of the proposed tower site. According to the FCC data base (June 16, 2017), the only station located within 100 meters is WTVQ-TV on the same tower. WTVQ-DT will diplex its operation from the same antenna and is included in the RFF calculations below. According to the owner, access to the tower property is prevented by an eight foot security fence with a locked gate.

The proposed operation based upon the current OET Bulletin No. 65, Edition 97-01 dated August 1997 and Supplement A meets the provisions of the FCC radio frequency field ("RFF") guidelines, and thus, complies with Section 1.1307 of the FCC Rules.

The RFF contribution of each station will be calculated using the following formula:

$$S = \frac{33.4(F^2) \text{ Total ERP}}{R^2}$$

where:

S = power density in $\mu\text{W}/\text{cm}^2$

F = relative field factor

Total ERP = ERP Horizontal Polarization + ERP Vertical Polarization

R = RCAGL - 2 meters

ERP = RMS ERP in watts for DTV Stations

The elevation pattern for the Dielectric, Type TFU-30DSC/VP-R 3S180 antenna in Exhibit E-2 shows a maximum relative field of less than 0.115 toward the ground (10° to 90° below the horizontal). Calculation according to OET Bulletin 65 predicts a maximum RFF power density of less than $2.27 \mu\text{W}/\text{cm}^2$, 2 meters above ground or less than two percent of the uncontrolled (general public) Maximum Permissible Exposure (“MPE”) guideline of $381 \mu\text{W}/\text{cm}^2$.

The repacked Channel 27 for WTVQ-DT from the diplexed antenna predicts an RFF contribution of WTVQ-DT of less than one percent the uncontrolled MPE guidelines. The total predicted RFF contribution (2 meters AGL) of the two stations expected to operate for the existing tower (WLEX-TV and WTVQ-DT) is less than five percent (5%) of the uncontrolled (general public) MPE guidelines.

According to the licensee, RFF safety will be coordinated with the site owner.

Authorized personnel and rigging contractors will be alerted to the potential zone of high field levels on the tower, and if necessary, the station will operate with reduced power or terminate the operation of the transmitter as appropriate when it is necessary for authorized personnel or contractors to

perform work on or near the tower. Workers and the general public, therefore, will not be subjected to RFF levels in excess of the current FCC guidelines.

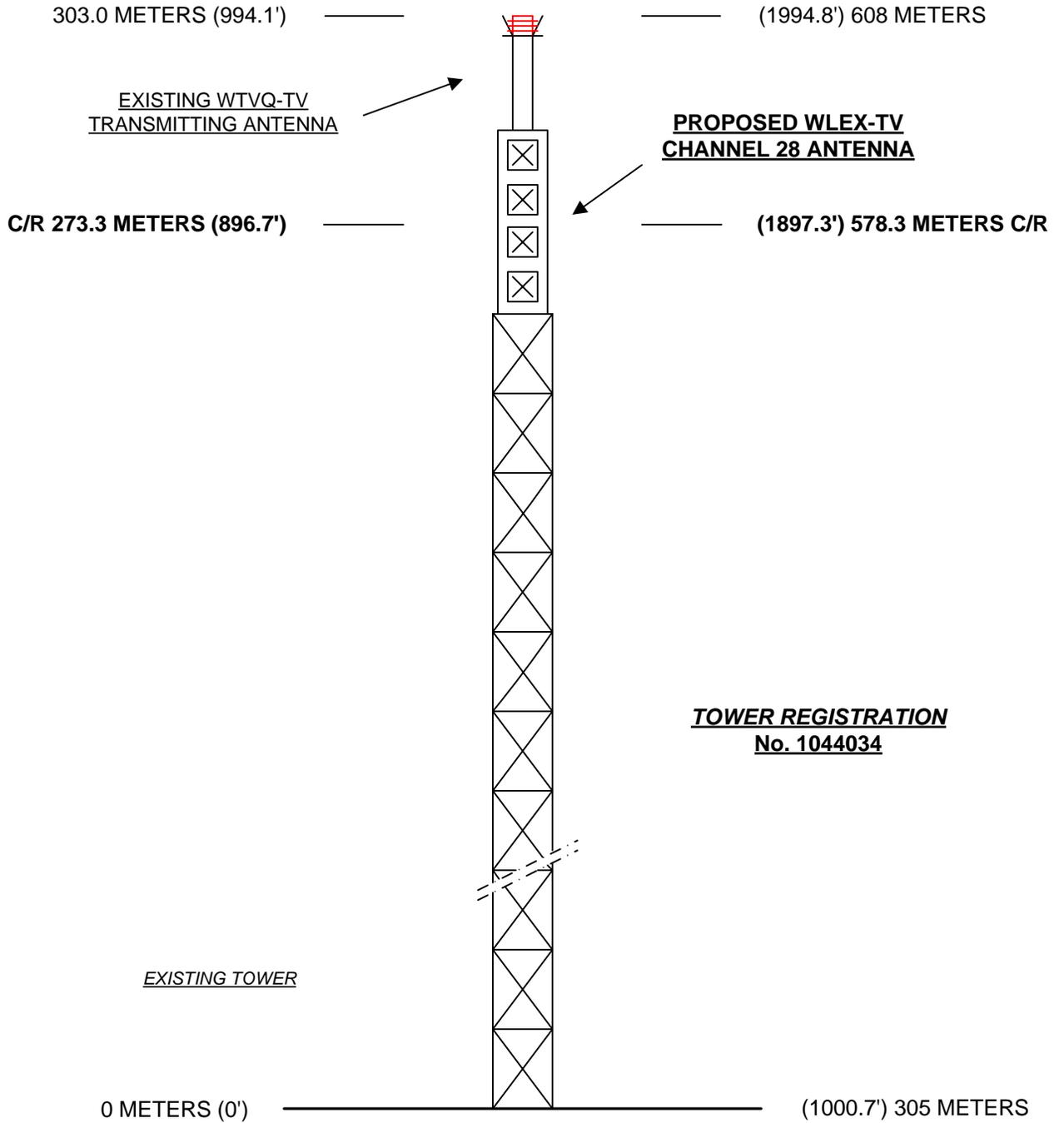
An environmental assessment (“EA”) is categorically excluded under Section 1.1306 of the FCC Rules and Regulations since the licensee indicates that:

- (a)(1) The proposed facilities mounted on an existing tower are not located in an officially designated wilderness area.
- (a)(2) The proposed facilities mounted on an existing tower are not located in an officially designated wildlife preserve.
- (a)(3) The proposed facilities mounted on an existing tower will not affect any listed threatened or endangered species or habitats.
- (a)(3)(ii) The proposed facilities mounted on an existing tower will not jeopardize the continued existence of any proposed endangered or threatened species and are not likely to result in the destruction or adverse modification of proposed critical habitats.
- (a)(4) The proposed facilities located on an existing tower will not affect any known districts, sites, buildings, structures, or objects significant in American history, architecture, archaeology, engineering, or culture.
- (a)(5) The existing tower is not located near any known Indian religious sites.
- (a)(6) The existing tower is not located in a flood plain.
- (a)(7) The installation of the DTV facilities on a tower at an existing site will not involve a significant change in surface features of the ground in the vicinity of the tower.
- (a)(8) It is not proposed to equip the tower with high intensity white lights unless required by the FAA.

- (b) Workers and the general public will not be subjected to RFF levels in excess of the current FCC guidelines. Authorized personnel will be alerted to areas unauthorized on the tower where potential radiation levels are in excess of the FCC guidelines. A security fence with a locked gate restricts unauthorized access to the tower site.

ABOVE GROUND

ABOVE MEAN SEA LEVEL



NOT TO SCALE

EXHIBIT E - 1
VERTICAL SKETCH
FOR THE PROPOSED DTV OPERATION OF
WLEX-TV, LEXINGTON, KENTUCKY
JUNE 2017

EXHIBIT E-2

ANTENNA MANUFACTURER DATA



TFU-30DSC/VP-R 3S180 DC

Proposal Number: C-70121
Date: 17-Feb-17
Customer: Cordillera
Location: Lexington, KY

Electrical Specifications

Polarization	Elliptical				
Azimuth Pattern	Directional				
Antenna Input	6-1/8" 75	75 Ohm	EIA/DCA		
VSWR	Channel	1.08 : 1		Band	1.08 : 1
Bandwidth	12 MHz				
Rated Input Power	40 kW	(16.02 dBk)	Maximum combined average power		

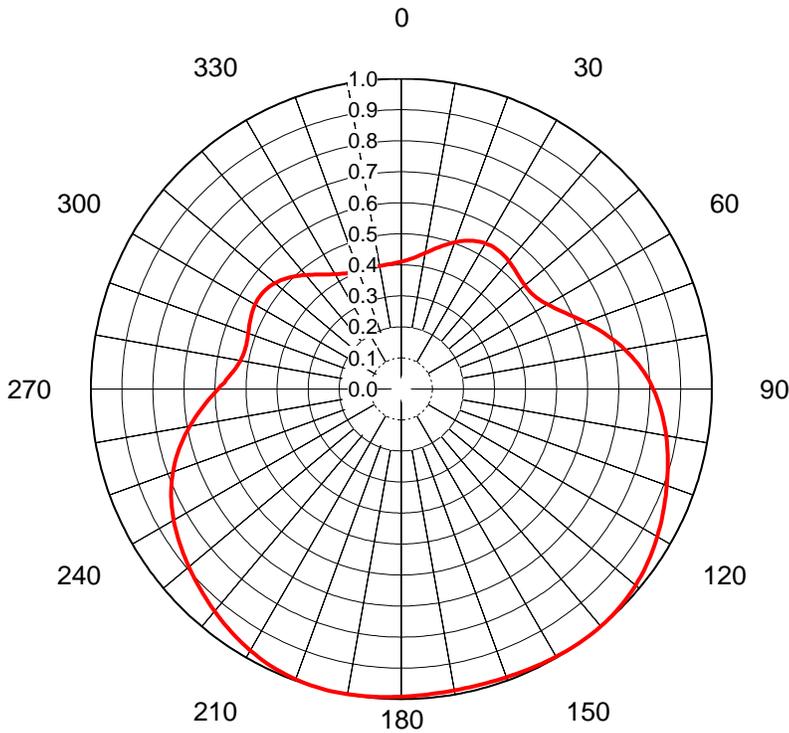
Mechanical Specifications

Mounting	Side Mounted			
Environmental Protection	Full Radome			
Height	59.1 ft (18m)			
Weight	2200 lb (1t)			
Effective Projected Area	57 ft ² (5.3m ²)	TIA-222-G	Basic Wind Speed	89 m/h (143.2 km/h)

Channel Specifications

	Call	CH	Freq	Hpol ERP	Vpol ERP	TPO	Peak Main Lobe Hpol Gain	Peak Main Lobe Vpol Gain	Peak at Horizontal Hpol Gain	Peak at Horizontal Vpol Gain
1	WTVQ	27	551 MHz	487.0 kW (26.88 dBk)	146.1 kW (21.65 dBk)	19.5 kW (12.91 dBk)	32.28 (15.09dB)	9.68 (9.86dB)	20.61 (13.14dB)	6.18 (7.91dB)
2	WLEX	28	557 MHz	379.0 kW (25.79 dBk)	113.7 kW (20.56 dBk)	15.2 kW (11.82 dBk)	32.35 (15.10dB)	9.70 (9.87dB)	20.65 (13.15dB)	6.19 (7.92dB)

AZIMUTH PATTERN Horizontal Polarization



Proposal No. **C-70121**
 Date **17-Feb-17**
 Call Letters **WTVQ 27**
 Frequency **551 MHz**
 Antenna Type **TFU-30DSC/VP-R 3S180DC**

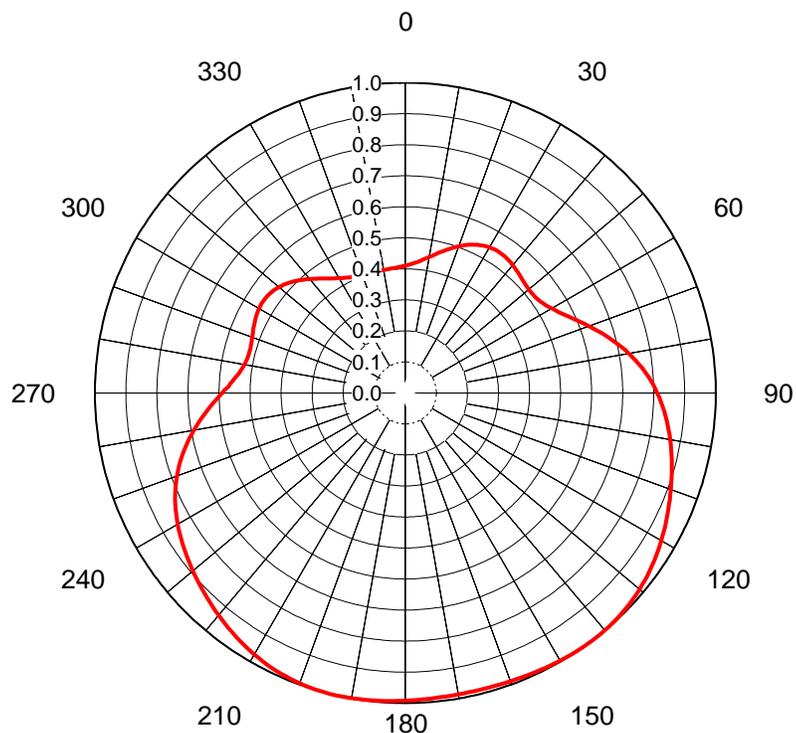
 Gain **1.77 (2.47dB)**
Calculated

 Directional
 Drawing # **TFU-4S180-39**

Deg	Value																		
0	0.410	36	0.544	72	0.650	108	0.902	144	1.000	180	0.992	216	0.952	252	0.767	288	0.521	324	0.456
1	0.412	37	0.543	73	0.660	109	0.906	145	1.000	181	0.993	217	0.948	253	0.758	289	0.523	325	0.450
2	0.414	38	0.542	74	0.671	110	0.910	146	0.999	182	0.994	218	0.944	254	0.750	290	0.525	326	0.445
3	0.417	39	0.540	75	0.681	111	0.914	147	0.999	183	0.995	219	0.940	255	0.740	291	0.527	327	0.440
4	0.420	40	0.538	76	0.692	112	0.919	148	0.998	184	0.995	220	0.936	256	0.731	292	0.529	328	0.435
5	0.423	41	0.536	77	0.702	113	0.923	149	0.998	185	0.996	221	0.931	257	0.721	293	0.532	329	0.431
6	0.427	42	0.534	78	0.712	114	0.927	150	0.997	186	0.997	222	0.927	258	0.712	294	0.534	330	0.427
7	0.431	43	0.532	79	0.721	115	0.931	151	0.996	187	0.998	223	0.923	259	0.702	295	0.536	331	0.423
8	0.435	44	0.529	80	0.731	116	0.936	152	0.995	188	0.998	224	0.919	260	0.692	296	0.538	332	0.420
9	0.440	45	0.527	81	0.740	117	0.940	153	0.995	189	0.999	225	0.914	261	0.681	297	0.540	333	0.417
10	0.445	46	0.525	82	0.750	118	0.944	154	0.994	190	0.999	226	0.910	262	0.671	298	0.542	334	0.414
11	0.450	47	0.523	83	0.758	119	0.948	155	0.993	191	1.000	227	0.906	263	0.660	299	0.543	335	0.412
12	0.456	48	0.521	84	0.767	120	0.952	156	0.992	192	1.000	228	0.902	264	0.650	300	0.544	336	0.410
13	0.462	49	0.520	85	0.775	121	0.956	157	0.991	193	1.000	229	0.897	265	0.640	301	0.545	337	0.408
14	0.467	50	0.519	86	0.783	122	0.960	158	0.990	194	1.000	230	0.893	266	0.629	302	0.545	338	0.407
15	0.473	51	0.519	87	0.790	123	0.963	159	0.990	195	1.000	231	0.889	267	0.619	303	0.545	339	0.406
16	0.479	52	0.519	88	0.798	124	0.967	160	0.989	196	0.999	232	0.884	268	0.609	304	0.545	340	0.405
17	0.485	53	0.520	89	0.805	125	0.970	161	0.988	197	0.999	233	0.880	269	0.600	305	0.543	341	0.404
18	0.491	54	0.521	90	0.812	126	0.974	162	0.988	198	0.998	234	0.875	270	0.590	306	0.542	342	0.404
19	0.497	55	0.523	91	0.818	127	0.977	163	0.987	199	0.997	235	0.871	271	0.581	307	0.540	343	0.403
20	0.503	56	0.526	92	0.824	128	0.980	164	0.987	200	0.996	236	0.866	272	0.570	308	0.537	344	0.403
21	0.508	57	0.530	93	0.830	129	0.982	165	0.987	201	0.995	237	0.862	273	0.565	309	0.534	345	0.403
22	0.514	58	0.534	94	0.836	130	0.985	166	0.986	202	0.993	238	0.857	274	0.557	310	0.531	346	0.403
23	0.518	59	0.539	95	0.841	131	0.987	167	0.986	203	0.991	239	0.852	275	0.551	311	0.527	347	0.403
24	0.523	60	0.544	96	0.847	132	0.989	168	0.986	204	0.989	240	0.847	276	0.544	312	0.523	348	0.403
25	0.527	61	0.551	97	0.852	133	0.991	169	0.986	205	0.987	241	0.841	277	0.539	313	0.518	349	0.403
26	0.531	62	0.557	98	0.857	134	0.993	170	0.986	206	0.985	242	0.836	278	0.534	314	0.514	350	0.403
27	0.534	63	0.565	99	0.862	135	0.995	171	0.987	207	0.982	243	0.830	279	0.530	315	0.508	351	0.403
28	0.537	64	0.573	100	0.866	136	0.996	172	0.987	208	0.980	244	0.824	280	0.526	316	0.503	352	0.403
29	0.540	65	0.581	101	0.871	137	0.997	173	0.987	209	0.977	245	0.818	281	0.523	317	0.497	353	0.403
30	0.542	66	0.590	102	0.875	138	0.998	174	0.988	210	0.974	246	0.812	282	0.521	318	0.491	354	0.404
31	0.543	67	0.600	103	0.880	139	0.999	175	0.988	211	0.970	247	0.805	283	0.520	319	0.485	355	0.404
32	0.545	68	0.609	104	0.884	140	0.999	176	0.989	212	0.967	248	0.798	284	0.519	320	0.479	356	0.405
33	0.545	69	0.619	105	0.889	141	1.000	177	0.990	213	0.963	249	0.790	285	0.519	321	0.473	357	0.406
34	0.545	70	0.629	106	0.893	142	1.000	178	0.990	214	0.960	250	0.783	286	0.519	322	0.467	358	0.407
35	0.545	71	0.640	107	0.897	143	1.000	179	0.991	215	0.956	251	0.775	287	0.520	323	0.462	359	0.408

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AZIMUTH PATTERN Horizontal Polarization



Proposal No. **C-70121**
 Date **17-Feb-17**
 Call Letters **WLEX 28**
 Frequency **557 MHz**
 Antenna Type **TFU-30DSC/VP-R 3S180DC**

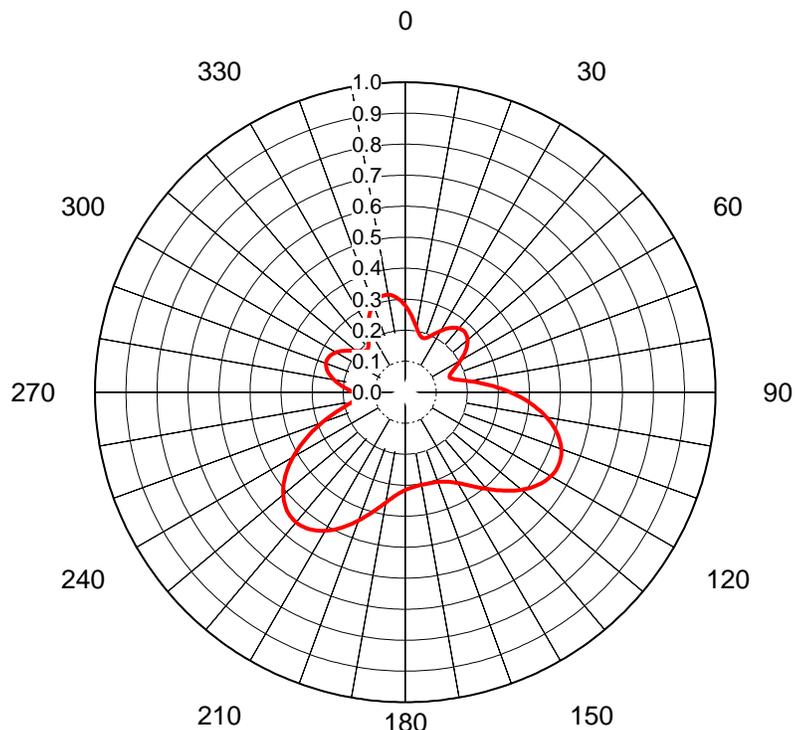
 Gain **1.77 (2.47dB)**
Calculated

 Directional
 Drawing # **TFU-4S180-40**

Deg	Value																		
0	0.410	36	0.544	72	0.650	108	0.902	144	1.000	180	0.992	216	0.952	252	0.767	288	0.521	324	0.456
1	0.412	37	0.543	73	0.660	109	0.906	145	1.000	181	0.993	217	0.948	253	0.758	289	0.523	325	0.450
2	0.414	38	0.542	74	0.671	110	0.910	146	0.999	182	0.994	218	0.944	254	0.750	290	0.525	326	0.445
3	0.417	39	0.540	75	0.681	111	0.914	147	0.999	183	0.995	219	0.940	255	0.740	291	0.527	327	0.440
4	0.420	40	0.538	76	0.692	112	0.919	148	0.998	184	0.995	220	0.936	256	0.731	292	0.529	328	0.435
5	0.423	41	0.536	77	0.702	113	0.923	149	0.998	185	0.996	221	0.931	257	0.721	293	0.532	329	0.431
6	0.427	42	0.534	78	0.712	114	0.927	150	0.997	186	0.997	222	0.927	258	0.712	294	0.534	330	0.427
7	0.431	43	0.532	79	0.721	115	0.931	151	0.996	187	0.998	223	0.923	259	0.702	295	0.536	331	0.423
8	0.435	44	0.529	80	0.731	116	0.936	152	0.995	188	0.998	224	0.919	260	0.692	296	0.538	332	0.420
9	0.440	45	0.527	81	0.740	117	0.940	153	0.995	189	0.999	225	0.914	261	0.681	297	0.540	333	0.417
10	0.445	46	0.525	82	0.750	118	0.944	154	0.994	190	0.999	226	0.910	262	0.671	298	0.542	334	0.414
11	0.450	47	0.523	83	0.758	119	0.948	155	0.993	191	1.000	227	0.906	263	0.660	299	0.543	335	0.412
12	0.456	48	0.521	84	0.767	120	0.952	156	0.992	192	1.000	228	0.902	264	0.650	300	0.544	336	0.410
13	0.462	49	0.520	85	0.775	121	0.956	157	0.991	193	1.000	229	0.897	265	0.640	301	0.545	337	0.408
14	0.467	50	0.519	86	0.783	122	0.960	158	0.990	194	1.000	230	0.893	266	0.629	302	0.545	338	0.407
15	0.473	51	0.519	87	0.790	123	0.963	159	0.990	195	1.000	231	0.889	267	0.619	303	0.545	339	0.406
16	0.479	52	0.519	88	0.798	124	0.967	160	0.989	196	0.999	232	0.884	268	0.609	304	0.545	340	0.405
17	0.485	53	0.520	89	0.805	125	0.970	161	0.988	197	0.999	233	0.880	269	0.600	305	0.543	341	0.404
18	0.491	54	0.521	90	0.812	126	0.974	162	0.988	198	0.998	234	0.875	270	0.590	306	0.542	342	0.404
19	0.497	55	0.523	91	0.818	127	0.977	163	0.987	199	0.997	235	0.871	271	0.581	307	0.540	343	0.403
20	0.503	56	0.526	92	0.824	128	0.980	164	0.987	200	0.996	236	0.866	272	0.570	308	0.537	344	0.403
21	0.508	57	0.530	93	0.830	129	0.982	165	0.987	201	0.995	237	0.862	273	0.565	309	0.534	345	0.403
22	0.514	58	0.534	94	0.836	130	0.985	166	0.986	202	0.993	238	0.857	274	0.557	310	0.531	346	0.403
23	0.518	59	0.539	95	0.841	131	0.987	167	0.986	203	0.991	239	0.852	275	0.551	311	0.527	347	0.403
24	0.523	60	0.544	96	0.847	132	0.989	168	0.986	204	0.989	240	0.847	276	0.544	312	0.523	348	0.403
25	0.527	61	0.551	97	0.852	133	0.991	169	0.986	205	0.987	241	0.841	277	0.539	313	0.518	349	0.403
26	0.531	62	0.557	98	0.857	134	0.993	170	0.986	206	0.985	242	0.836	278	0.534	314	0.514	350	0.403
27	0.534	63	0.565	99	0.862	135	0.995	171	0.987	207	0.982	243	0.830	279	0.530	315	0.508	351	0.403
28	0.537	64	0.573	100	0.866	136	0.996	172	0.987	208	0.980	244	0.824	280	0.526	316	0.503	352	0.403
29	0.540	65	0.581	101	0.871	137	0.997	173	0.987	209	0.977	245	0.818	281	0.523	317	0.497	353	0.403
30	0.542	66	0.590	102	0.875	138	0.998	174	0.988	210	0.974	246	0.812	282	0.521	318	0.491	354	0.404
31	0.543	67	0.600	103	0.880	139	0.999	175	0.988	211	0.970	247	0.805	283	0.520	319	0.485	355	0.404
32	0.545	68	0.609	104	0.884	140	0.999	176	0.989	212	0.967	248	0.798	284	0.519	320	0.479	356	0.405
33	0.545	69	0.619	105	0.889	141	1.000	177	0.990	213	0.963	249	0.790	285	0.519	321	0.473	357	0.406
34	0.545	70	0.629	106	0.893	142	1.000	178	0.990	214	0.960	250	0.783	286	0.519	322	0.467	358	0.407
35	0.545	71	0.640	107	0.897	143	1.000	179	0.991	215	0.956	251	0.775	287	0.520	323	0.462	359	0.408

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AZIMUTH PATTERN Vertical Polarization



Proposal No. **C-70121**
 Date **17-Feb-17**
 Call Letters **WTVQ 27**
 Frequency **551 MHz**
 Antenna Type **TFU-30DSC/VP-R 3S180DC**

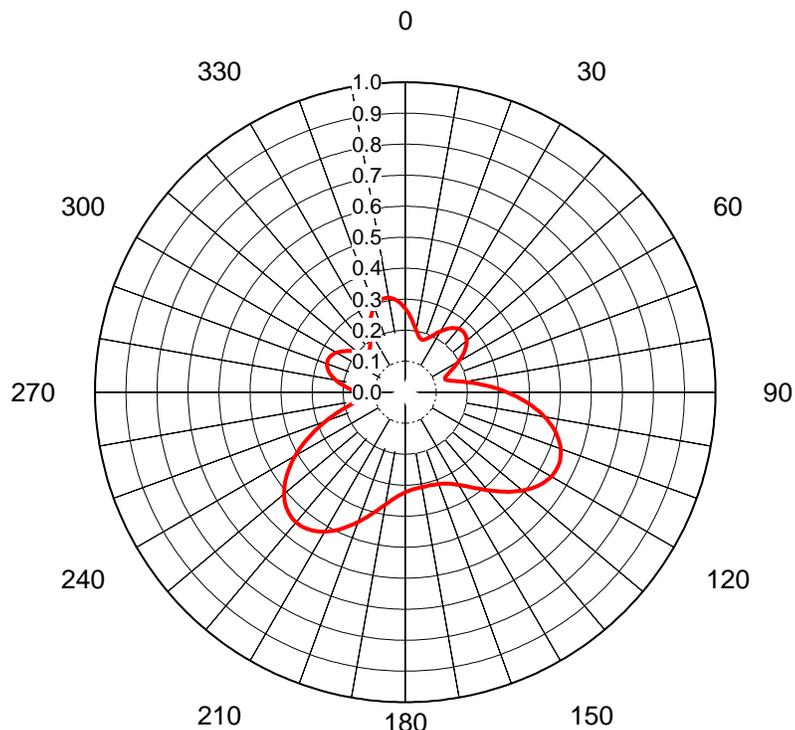
 Gain **2.6 (4.14dB)**
Calculated

 Directional
 Drawing # **TFU-4S180-V-27**

Deg	Value																		
0	0.280	36	0.257	72	0.152	108	0.526	144	0.375	180	0.316	216	0.542	252	0.257	288	0.268	324	0.200
1	0.273	37	0.261	73	0.154	109	0.531	145	0.368	181	0.319	217	0.545	253	0.244	289	0.270	325	0.206
2	0.267	38	0.264	74	0.158	110	0.535	146	0.362	182	0.322	218	0.546	254	0.231	290	0.272	326	0.212
3	0.260	39	0.267	75	0.163	111	0.539	147	0.355	183	0.325	219	0.547	255	0.219	291	0.272	327	0.218
4	0.253	40	0.269	76	0.170	112	0.542	148	0.349	184	0.329	220	0.548	256	0.207	292	0.273	328	0.225
5	0.246	41	0.271	77	0.177	113	0.545	149	0.343	185	0.333	221	0.547	257	0.197	293	0.273	329	0.231
6	0.239	42	0.272	78	0.187	114	0.546	150	0.338	186	0.338	222	0.546	258	0.187	294	0.272	330	0.239
7	0.231	43	0.273	79	0.197	115	0.547	151	0.333	187	0.343	223	0.545	259	0.177	295	0.271	331	0.246
8	0.225	44	0.273	80	0.207	116	0.548	152	0.329	188	0.349	224	0.542	260	0.170	296	0.269	332	0.253
9	0.218	45	0.272	81	0.219	117	0.547	153	0.325	189	0.355	225	0.539	261	0.163	297	0.267	333	0.260
10	0.212	46	0.272	82	0.231	118	0.546	154	0.322	190	0.362	226	0.535	262	0.158	298	0.264	334	0.267
11	0.206	47	0.270	83	0.244	119	0.545	155	0.319	191	0.368	227	0.531	263	0.154	299	0.261	335	0.273
12	0.200	48	0.268	84	0.257	120	0.542	156	0.316	192	0.375	228	0.526	264	0.152	300	0.257	336	0.280
13	0.196	49	0.265	85	0.270	121	0.539	157	0.313	193	0.383	229	0.520	265	0.151	301	0.253	337	0.286
14	0.192	50	0.262	86	0.284	122	0.536	158	0.311	194	0.391	230	0.514	266	0.152	302	0.249	338	0.291
15	0.188	51	0.259	87	0.298	123	0.532	159	0.310	195	0.399	231	0.506	267	0.154	303	0.244	339	0.297
16	0.186	52	0.255	88	0.311	124	0.527	160	0.308	196	0.407	232	0.499	268	0.157	304	0.239	340	0.301
17	0.185	53	0.250	89	0.325	125	0.522	161	0.307	197	0.415	233	0.490	269	0.162	305	0.234	341	0.306
18	0.184	54	0.245	90	0.339	126	0.516	162	0.306	198	0.424	234	0.481	270	0.167	306	0.228	342	0.309
19	0.184	55	0.239	91	0.352	127	0.510	163	0.305	199	0.432	235	0.472	271	0.173	307	0.223	343	0.313
20	0.185	56	0.233	92	0.366	128	0.503	164	0.304	200	0.441	236	0.462	272	0.179	308	0.218	344	0.315
21	0.188	57	0.227	93	0.379	129	0.497	165	0.304	201	0.449	237	0.451	273	0.186	309	0.212	345	0.317
22	0.190	58	0.221	94	0.392	130	0.489	166	0.304	202	0.457	238	0.440	274	0.193	310	0.207	346	0.319
23	0.194	59	0.214	95	0.405	131	0.482	167	0.304	203	0.466	239	0.429	275	0.200	311	0.202	347	0.320
24	0.198	60	0.207	96	0.417	132	0.474	168	0.303	204	0.474	240	0.417	276	0.207	312	0.198	348	0.320
25	0.202	61	0.200	97	0.429	133	0.466	169	0.304	205	0.482	241	0.405	277	0.214	313	0.194	349	0.320
26	0.207	62	0.193	98	0.440	134	0.457	170	0.304	206	0.489	242	0.392	278	0.221	314	0.190	350	0.319
27	0.212	63	0.186	99	0.451	135	0.449	171	0.304	207	0.497	243	0.379	279	0.227	315	0.188	351	0.317
28	0.218	64	0.179	100	0.462	136	0.441	172	0.304	208	0.503	244	0.366	280	0.233	316	0.185	352	0.315
29	0.223	65	0.173	101	0.472	137	0.432	173	0.305	209	0.510	245	0.352	281	0.239	317	0.184	353	0.313
30	0.228	66	0.167	102	0.481	138	0.424	174	0.306	210	0.516	246	0.339	282	0.245	318	0.184	354	0.309
31	0.234	67	0.162	103	0.490	139	0.415	175	0.307	211	0.522	247	0.325	283	0.250	319	0.185	355	0.306
32	0.239	68	0.157	104	0.499	140	0.407	176	0.308	212	0.527	248	0.311	284	0.255	320	0.186	356	0.301
33	0.244	69	0.154	105	0.506	141	0.399	177	0.310	213	0.532	249	0.298	285	0.259	321	0.188	357	0.297
34	0.249	70	0.152	106	0.514	142	0.391	178	0.311	214	0.536	250	0.284	286	0.262	322	0.192	358	0.291
35	0.253	71	0.151	107	0.520	143	0.383	179	0.313	215	0.539	251	0.270	287	0.265	323	0.196	359	0.286

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AZIMUTH PATTERN Vertical Polarization



Proposal No. **C-70121**
 Date **17-Feb-17**
 Call Letters **WLEX 28**
 Frequency **557 MHz**
 Antenna Type **TFU-30DSC/VP-R 3S180DC**

 Gain **2.63 (4.2dB)**
Calculated

 Directional
 Drawing # **TFU-4S180-V-28**

Deg	Value																		
0	0.270	36	0.255	72	0.136	108	0.523	144	0.382	180	0.323	216	0.544	252	0.244	288	0.265	324	0.192
1	0.264	37	0.259	73	0.137	109	0.528	145	0.375	181	0.325	217	0.546	253	0.230	289	0.267	325	0.197
2	0.257	38	0.262	74	0.141	110	0.533	146	0.368	182	0.329	218	0.547	254	0.217	290	0.269	326	0.203
3	0.251	39	0.265	75	0.146	111	0.537	147	0.362	183	0.332	219	0.548	255	0.205	291	0.270	327	0.209
4	0.244	40	0.267	76	0.153	112	0.541	148	0.356	184	0.336	220	0.548	256	0.193	292	0.270	328	0.216
5	0.237	41	0.269	77	0.161	113	0.544	149	0.350	185	0.340	221	0.547	257	0.181	293	0.270	329	0.223
6	0.229	42	0.270	78	0.171	114	0.546	150	0.345	186	0.345	222	0.546	258	0.171	294	0.270	330	0.229
7	0.223	43	0.270	79	0.181	115	0.547	151	0.340	187	0.350	223	0.544	259	0.161	295	0.269	331	0.237
8	0.216	44	0.270	80	0.193	116	0.548	152	0.336	188	0.356	224	0.541	260	0.153	296	0.267	332	0.244
9	0.209	45	0.270	81	0.205	117	0.548	153	0.332	189	0.362	225	0.537	261	0.146	297	0.265	333	0.251
10	0.203	46	0.269	82	0.217	118	0.547	154	0.329	190	0.368	226	0.533	262	0.141	298	0.262	334	0.257
11	0.197	47	0.267	83	0.230	119	0.546	155	0.325	191	0.375	227	0.528	263	0.137	299	0.259	335	0.264
12	0.192	48	0.265	84	0.244	120	0.544	156	0.323	192	0.382	228	0.523	264	0.136	300	0.255	336	0.270
13	0.188	49	0.262	85	0.258	121	0.541	157	0.320	193	0.389	229	0.517	265	0.135	301	0.251	337	0.276
14	0.184	50	0.259	86	0.272	122	0.538	158	0.318	194	0.397	230	0.510	266	0.137	302	0.247	338	0.282
15	0.181	51	0.255	87	0.286	123	0.534	159	0.317	195	0.405	231	0.502	267	0.140	303	0.242	339	0.287
16	0.179	52	0.250	88	0.300	124	0.530	160	0.315	196	0.413	232	0.494	268	0.144	304	0.237	340	0.292
17	0.178	53	0.245	89	0.314	125	0.525	161	0.314	197	0.421	233	0.485	269	0.149	305	0.232	341	0.296
18	0.178	54	0.240	90	0.328	126	0.519	162	0.313	198	0.429	234	0.476	270	0.155	306	0.226	342	0.300
19	0.179	55	0.234	91	0.342	127	0.513	163	0.312	199	0.437	235	0.466	271	0.162	307	0.221	343	0.303
20	0.181	56	0.228	92	0.356	128	0.507	164	0.312	200	0.446	236	0.456	272	0.169	308	0.215	344	0.306
21	0.183	57	0.221	93	0.370	129	0.500	165	0.311	201	0.454	237	0.445	273	0.177	309	0.210	345	0.308
22	0.186	58	0.214	94	0.383	130	0.493	166	0.311	202	0.462	238	0.433	274	0.184	310	0.204	346	0.310
23	0.190	59	0.207	95	0.396	131	0.486	167	0.311	203	0.470	239	0.421	275	0.192	311	0.199	347	0.310
24	0.194	60	0.200	96	0.409	132	0.478	168	0.311	204	0.478	240	0.409	276	0.200	312	0.194	348	0.311
25	0.199	61	0.192	97	0.421	133	0.470	169	0.311	205	0.486	241	0.396	277	0.207	313	0.190	349	0.310
26	0.204	62	0.184	98	0.433	134	0.462	170	0.311	206	0.493	242	0.383	278	0.214	314	0.186	350	0.310
27	0.210	63	0.177	99	0.445	135	0.454	171	0.311	207	0.500	243	0.370	279	0.221	315	0.183	351	0.308
28	0.215	64	0.169	100	0.456	136	0.446	172	0.312	208	0.507	244	0.356	280	0.228	316	0.181	352	0.306
29	0.221	65	0.162	101	0.466	137	0.437	173	0.312	209	0.513	245	0.342	281	0.234	317	0.179	353	0.303
30	0.226	66	0.155	102	0.476	138	0.429	174	0.313	210	0.519	246	0.328	282	0.240	318	0.178	354	0.300
31	0.232	67	0.149	103	0.485	139	0.421	175	0.314	211	0.525	247	0.314	283	0.245	319	0.178	355	0.296
32	0.237	68	0.144	104	0.494	140	0.413	176	0.315	212	0.530	248	0.300	284	0.250	320	0.179	356	0.292
33	0.242	69	0.140	105	0.502	141	0.405	177	0.317	213	0.534	249	0.286	285	0.255	321	0.181	357	0.287
34	0.247	70	0.137	106	0.510	142	0.397	178	0.318	214	0.538	250	0.272	286	0.259	322	0.184	358	0.282
35	0.251	71	0.135	107	0.517	143	0.389	179	0.320	215	0.541	251	0.258	287	0.262	323	0.188	359	0.276

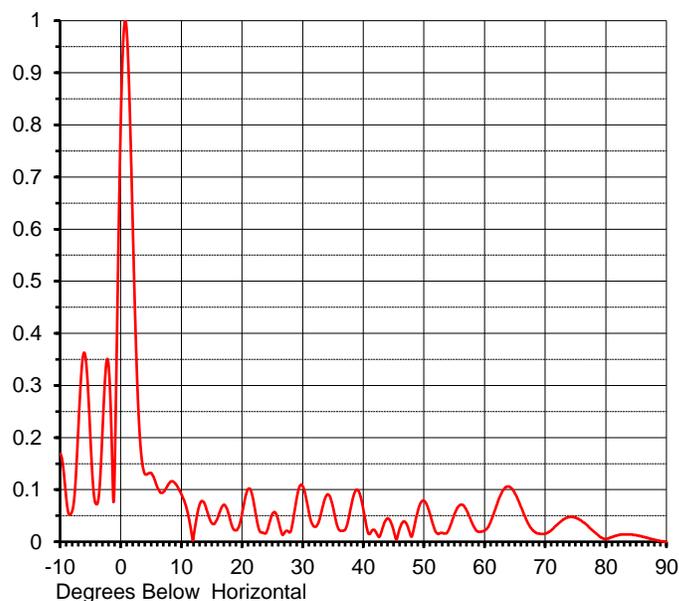
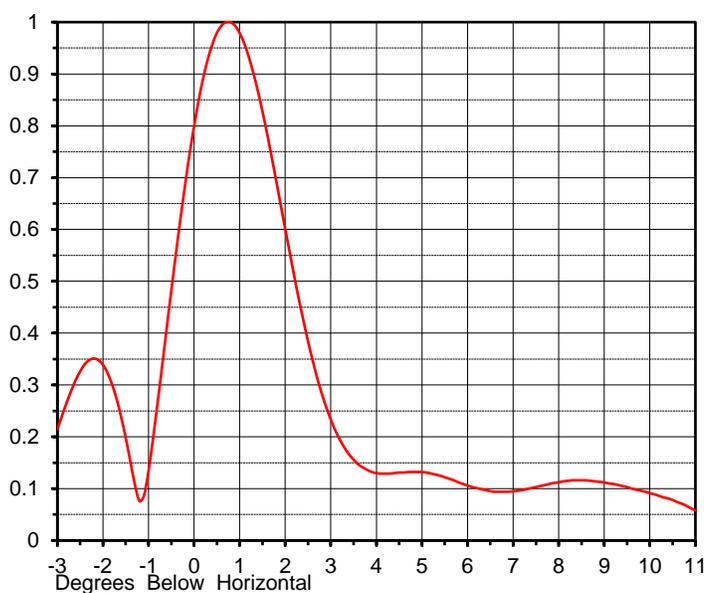
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ELEVATION PATTERN

Proposal No. **C-70121**
 Date **17-Feb-17**
 Call Letters **WTVQ 27**
 Frequency **551 MHz**
 Antenna Type **TFU-30DSC/VP-R 3S180D**

RMS Directivity at Main Lobe **22.00 (13.42 dB)**
 RMS Directivity at Horizontal **14.00 (11.46 dB)**
Calculated

Beam Tilt **0.75 deg**
 Drawing Number **20Q22075L075**



Angle	Field								
-10.0	0.168	10.0	0.091	30.0	0.107	50.0	0.079	70.0	0.016
-9.0	0.086	11.0	0.058	31.0	0.059	51.0	0.053	71.0	0.022
-8.0	0.059	12.0	0.008	32.0	0.029	52.0	0.018	72.0	0.033
-7.0	0.215	13.0	0.071	33.0	0.052	53.0	0.017	73.0	0.043
-6.0	0.363	14.0	0.068	34.0	0.090	54.0	0.021	74.0	0.047
-5.0	0.201	15.0	0.036	35.0	0.067	55.0	0.052	75.0	0.046
-4.0	0.072	16.0	0.046	36.0	0.023	56.0	0.071	76.0	0.040
-3.0	0.214	17.0	0.071	37.0	0.023	57.0	0.061	77.0	0.031
-2.0	0.339	18.0	0.045	38.0	0.068	58.0	0.035	78.0	0.020
-1.0	0.134	19.0	0.022	39.0	0.100	59.0	0.019	79.0	0.010
0.0	0.799	20.0	0.053	40.0	0.063	60.0	0.021	80.0	0.005
1.0	0.979	21.0	0.101	41.0	0.015	61.0	0.038	81.0	0.009
2.0	0.601	22.0	0.071	42.0	0.020	62.0	0.070	82.0	0.013
3.0	0.233	23.0	0.019	43.0	0.019	63.0	0.098	83.0	0.014
4.0	0.130	24.0	0.017	44.0	0.045	64.0	0.106	84.0	0.014
5.0	0.132	25.0	0.053	45.0	0.022	65.0	0.093	85.0	0.013
6.0	0.106	26.0	0.040	46.0	0.025	66.0	0.067	86.0	0.010
7.0	0.095	27.0	0.017	47.0	0.037	67.0	0.040	87.0	0.007
8.0	0.112	28.0	0.019	48.0	0.010	68.0	0.022	88.0	0.004
9.0	0.112	29.0	0.082	49.0	0.059	69.0	0.016	89.0	0.001
								90.0	0.000

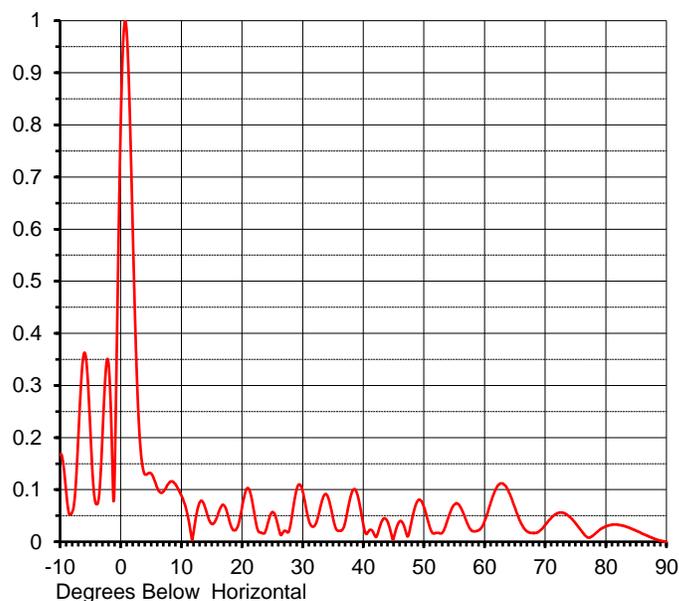
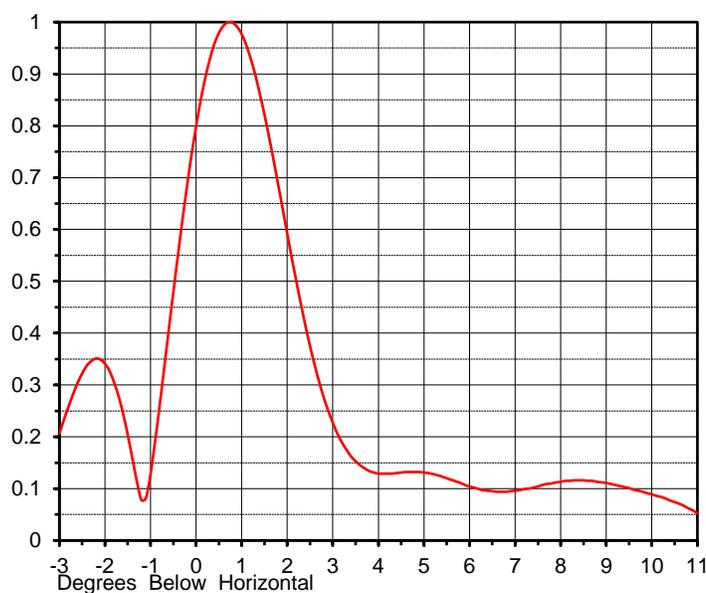
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ELEVATION PATTERN

Proposal No. **C-70121**
 Date **17-Feb-17**
 Call Letters **WLEX 28**
 Frequency **557 MHz**
 Antenna Type **TFU-30DSC/VP-R 3S180D**

RMS Directivity at Main Lobe **22.00 (13.42 dB)**
 RMS Directivity at Horizontal **14.00 (11.46 dB)**
Calculated

Beam Tilt **0.75 deg**
 Drawing Number **20Q22075H075**



<u>Angle Field</u>									
-10.0	0.167	10.0	0.089	30.0	0.097	50.0	0.067	70.0	0.032
-9.0	0.097	11.0	0.052	31.0	0.042	51.0	0.027	71.0	0.046
-8.0	0.057	12.0	0.017	32.0	0.031	52.0	0.017	72.0	0.055
-7.0	0.199	13.0	0.075	33.0	0.070	53.0	0.017	73.0	0.055
-6.0	0.363	14.0	0.063	34.0	0.090	54.0	0.045	74.0	0.048
-5.0	0.213	15.0	0.035	35.0	0.046	55.0	0.071	75.0	0.036
-4.0	0.072	16.0	0.051	36.0	0.021	56.0	0.067	76.0	0.021
-3.0	0.206	17.0	0.070	37.0	0.036	57.0	0.040	77.0	0.008
-2.0	0.341	18.0	0.037	38.0	0.090	58.0	0.021	78.0	0.013
-1.0	0.128	19.0	0.023	39.0	0.092	59.0	0.022	79.0	0.023
0.0	0.799	20.0	0.065	40.0	0.034	60.0	0.039	80.0	0.030
1.0	0.977	21.0	0.103	41.0	0.022	61.0	0.074	81.0	0.033
2.0	0.592	22.0	0.057	42.0	0.010	62.0	0.104	82.0	0.033
3.0	0.227	23.0	0.018	43.0	0.038	63.0	0.112	83.0	0.030
4.0	0.129	24.0	0.024	44.0	0.039	64.0	0.096	84.0	0.026
5.0	0.131	25.0	0.057	45.0	0.006	65.0	0.066	85.0	0.021
6.0	0.104	26.0	0.028	46.0	0.039	66.0	0.036	86.0	0.016
7.0	0.096	27.0	0.021	47.0	0.020	67.0	0.020	87.0	0.011
8.0	0.113	28.0	0.032	48.0	0.041	68.0	0.017	88.0	0.006
9.0	0.111	29.0	0.099	49.0	0.079	69.0	0.020	89.0	0.002
								90.0	0.000

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Summary

Proposal No.	C-70121
Date	17-Feb-17
Call Letters	WTVQ 27 DTV
Frequency	551 MHz
Antenna Type	TFU-30DSC/VP-R 3S180DC

Antenna

	Hpol		Vpol	
ERP:	487.0 kW	(26.88 dBk)	146.1 kW	(21.65 dBk)
Peak Gain*	32.28	(15.09 dB)	9.68	(9.86 dB)

Antenna Input Power **15.1 kW (11.79 dBk)**

Transmission Line

Type	Rigid	Attenuation	(1.12 dB)
Size	Size 6-1/8"	Efficiency	77.3%
Impedence	75 Ohm		
Length	980 ft	298.7 m	

Transmitter Output

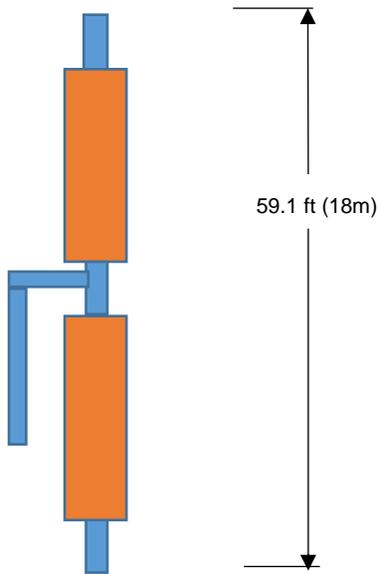
19.5 kW (12.91 dBk)

Transmitter filter losses not included

* Directivity and Gain are with respect to half wave dipole.

**Antenna Gain includes feed system losses

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Not to scale

MECHANICALS

Proposal No. **C-70121**
 Date **17-Feb-17**
 Call Letters **WTVQ** **27**
 Frequency **551 MHz**
 Antenna Type **TFU-30DSC/VP-R 3S180DC**

Preliminary Specifications

Side Mounted

Mechanical Specification without ice TIA-222-G

Height AGL(z) 900 ft (274.3 m)
 Basic Wind Speed 89 m/h (143.2 km/h)

Structure Class II
 Exposure Category C
 Topography Category 1

Mechanical Specifications with ice TIA-222-G

Design Ice 0.75 in $t_{iz} = 2.09$ in
 Wind Speed w/Ice 30 m/h (48.3 km/h)

Mechanical Specifications

		without ice	with ice
Height	H2	59.1 ft (18m)	
Height of Center of Radiation	H3	29.55 ft (9m)	
Effective Projected Area	(EPA) _A	57 ft ² (5.3m ²)	163.3 ft ² (15.2m ²)
Weight	W	2200 lb (1t)	6600 lb (3t)

Antenna designed in accordance with AISC specifications for design of structural steel as prescribed by TIA-222-G

Prepared by: CAB

Date: 17-Feb-17

ME:

EE:

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Summary

Proposal No.	C-70121
Date	17-Feb-17
Call Letters	WLEX 28
Frequency	557 MHz
Antenna Type	TFU-30DSC/VP-R 3S180DC

Antenna

	Hpol	Vpol
ERP:	379.0 kW (25.79 dBk)	113.7 kW (20.56 dBk)
Peak Gain*	32.35 (15.10 dB)	9.70 (9.87 dB)

Antenna Input Power 11.7 kW (10.69 dBk)

Transmission Line

Type	Rigid	Attenuation	(1.13 dB)
Size	Size 6-1/8"	Efficiency	77.2%
Impedence	75 Ohm		
Length	980 ft	298.7 m	

Transmitter Output

15.2 kW (11.82 dBk)

Transmitter filter losses not included

* Directivity and Gain are with respect to half wave dipole.

**Antenna Gain includes feed system losses

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TABLE I
COMPUTED COVERAGE DATA
FOR THE PROPOSED DTV OPERATION OF
WLEX-DT, LEXINGTON, KENTUCKY
CHANNEL 28 379 KW (MAX) ERP 286 METERS HAAT
JUNE 2017

<u>Radial</u> <u>Bearing</u> (N ° E, T)	<u>Average*</u>	<u>Effective</u> <u>Height</u> meters	<u>Depression</u> <u>Angle</u> degrees	<u>Effective</u> <u>Radiated</u> <u>Power</u> kW	<u>Distance to Contour F(50/90)</u>	
	<u>Elevation</u> <u>3.2 to 16.1 km</u> meters				<u>48 dBu</u> <u>City Grade</u> km	<u>40.14 dBu</u> <u>Noise-Limited</u> km
0	287.0	291.4	0.473	63.710	66.3	76.2
10	288.5	289.8	0.472	75.060	67.1	77.0
20	290.0	288.3	0.470	95.900	68.3	78.2
30	291.6	286.7	0.469	111.330	69.0	79.0
40	293.1	285.2	0.468	109.700	68.8	78.7
50	294.9	283.4	0.466	102.090	68.3	78.1
60	296.8	281.5	0.465	112.150	68.7	78.5
70	298.8	279.5	0.463	149.930	70.1	80.0
80	300.7	277.6	0.461	202.530	71.5	81.6
90	302.7	275.6	0.460	249.920	72.5	82.8
100	298.7	279.6	0.463	284.250	73.5	84.2
110	294.8	283.5	0.466	313.830	74.3	85.6
120	290.9	287.4	0.470	343.480	75.1	87.0
130	286.9	291.4	0.473	367.710	75.8	88.2
140	286.6	291.7	0.473	378.270	76.0	88.5
150	290.0	288.3	0.470	376.700	75.7	87.9
160	293.3	285.0	0.468	370.680	75.3	87.3
170	296.6	281.7	0.465	368.470	75.0	86.7
180	299.9	278.4	0.462	372.990	74.8	86.3
190	300.3	278.0	0.462	378.270	74.9	86.3
200	300.7	277.6	0.462	376.010	74.8	86.2
210	301.1	277.2	0.461	359.580	74.5	85.8
220	301.5	276.8	0.461	332.050	74.1	85.0
230	301.6	276.7	0.461	302.200	73.6	84.3
240	301.4	276.9	0.461	271.890	73.0	83.5
250	301.3	277.0	0.461	232.380	72.2	82.4
260	301.1	277.2	0.461	181.510	70.9	80.9
270	301.0	277.3	0.461	131.920	69.2	79.0

TABLE I
COMPUTED COVERAGE DATA
FOR THE PROPOSED DTV OPERATION OF
WLEX-DT, LEXINGTON, KENTUCKY
CHANNEL 28 379 KW (MAX) ERP 286 METERS HAAT
JUNE 2017

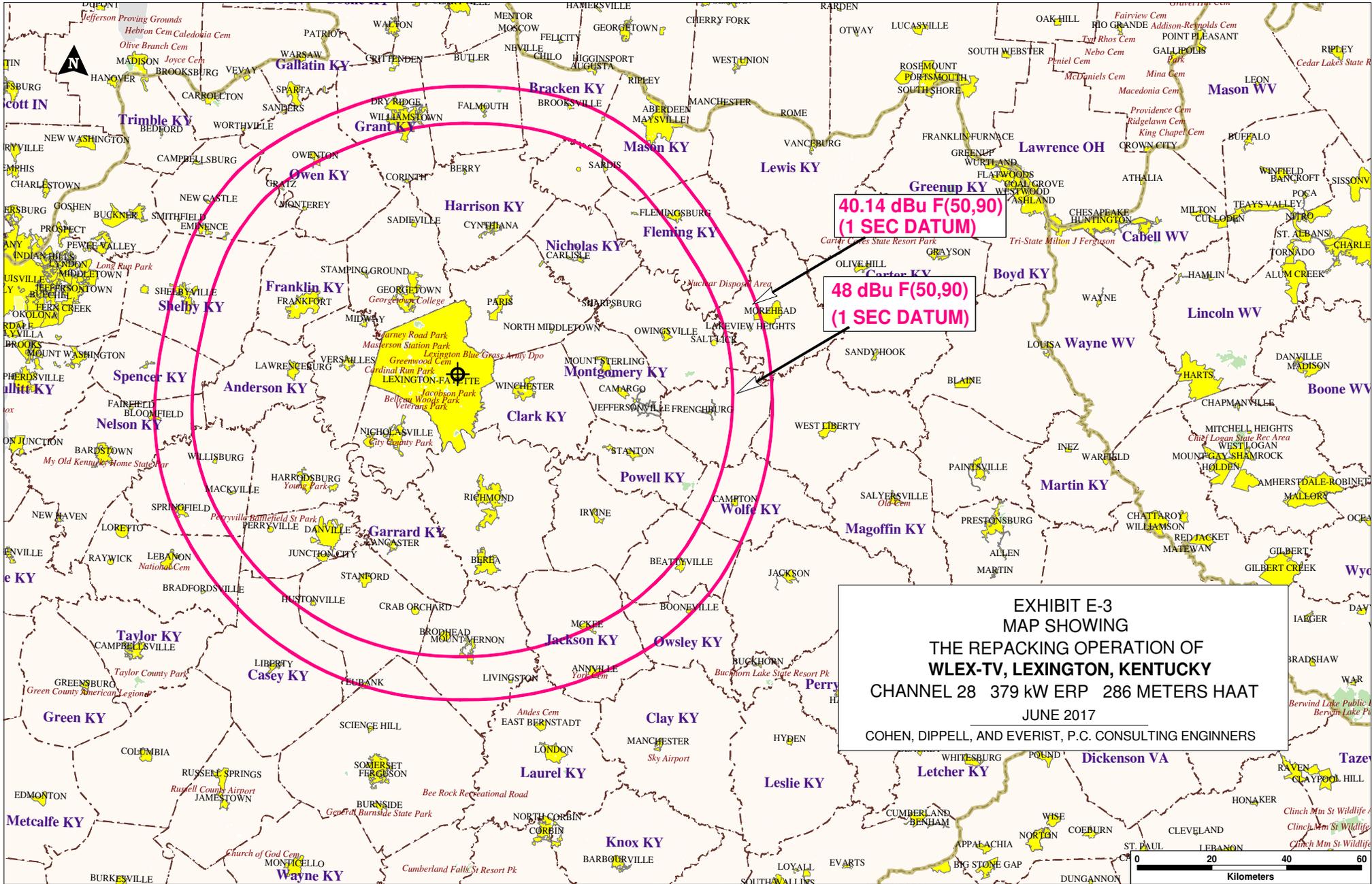
<u>Radial</u> <u>Bearing</u> (N ° E, T)	<u>Average*</u> <u>Elevation</u> <u>3.2 to 16.1 km</u> meters	<u>Effective</u> <u>Height</u> meters	<u>Depression</u> <u>Angle</u> degrees	<u>Effective</u> <u>Radiated</u> <u>Power</u> kW	<u>Distance to Contour F(50/90)</u>	
					<u>48 dBu</u> <u>City Grade</u> km	<u>40.14 dBu</u> <u>Noise-Limited</u> km
280	298.1	280.2	0.464	104.860	68.2	78.0
290	295.2	283.1	0.466	104.470	68.4	78.2
300	292.4	285.9	0.468	112.150	69.0	78.9
310	289.5	288.8	0.471	106.860	68.9	78.9
320	287.9	290.4	0.472	86.960	67.9	77.9
330	287.7	290.6	0.472	69.100	66.7	76.6
340	287.4	290.9	0.472	62.160	66.2	76.0
350	287.2	291.1	0.473	61.550	66.1	75.9

*Based on data from FCC one-second data base.

DTV Channel 28 (554-560 MHz)
Center of Radiation 578.3 meters AMSL
Antenna Height Above Average Terrain 286 meters
Effective Radiated Power 379 kW (25.79 dBk) Max.

North Latitude: 38° 02' 03"
West Longitude: 84° 23' 39"

(NAD-27)



**40.14 dBu F(50,90)
(1 SEC DATUM)**

**48 dBu F(50,90)
(1 SEC DATUM)**

**EXHIBIT E-3
MAP SHOWING
THE REPACKING OPERATION OF
WLEX-TV, LEXINGTON, KENTUCKY
CHANNEL 28 379 KW ERP 286 METERS HAAT
JUNE 2017
COHEN, DIPPELL, AND EVERIST, P.C. CONSULTING ENGINEERS**

