

Engineering Exhibit

REPORT FOR AN EXPERIMENTAL AUTHORIZATION

prepared for

Detroit Free Press, Inc.
WUSA(TV) Washington, DC

Facility ID 65593
Ch. 9 52 kW 235 m

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prepared for

Detroit Free Press, Inc.
WUSA(TV) Washington, D.C.
Facility ID 65593
Ch. 9 (digital) 52 kW 235m

Detroit Free Press, Inc. (“DFP”) is the licensee of WUSA(TV), digital Channel 9, Facility ID 65593, Washington, D.C. On June 12, 2009, shortly after the station terminated pre-transition digital operation on UHF Channel 34 and commenced digital operation on high-band VHF Channel 9, viewers called to report that they could no longer receive the station. Station personnel counseled callers on the change in digital channel, rescanning of TV sets and converter boxes. In a few cases, reception of WUSA was restored. However, many were still unable to receive the station’s signal.

Information collected from viewers having difficulty in receiving WUSA’s digital Channel 9 signal, found that many employed indoor, “rabbit-ear” style antennas. Whereas, the 1000 kW digital Channel 34 signal was easily received indoors, the 12.6 kW digital Channel 9 signal was substantially less robust. One of the many possible corrective solutions under consideration was to increase the station’s power output, thus increasing the signal’s power density. DFP requested and received Commission approval to increase WUSA’s effective radiated power (“ERP”) from 12.6 kW to 52 kW¹ using the existing authorized non-directional Channel 9 antenna (see BDSTA-20091218ACS). The instant report documents the results of interference testing and supports a request for continued operation of WUSA at the elevated power level.

A conventional OET-69 interference study similar to that employed by Commission Staff determined that the increase in ERP by WUSA from 12.6 kW to 52 kW affected two stations. The affected stations are WGAL(TV), Channel 8, Facility ID 53930, Lancaster, PA and WBPH-TV, Channel 9, Facility ID 60850, Bethlehem, PA. Both affected stations agreed to the WUSA experimental test if measurements were made to determine the actual level of interference.

¹ 52 kW ERP was selected based on existing transmitter capacity.

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Thus, the experimental authorization had two measurement requirements. The first requirement was to determine, by measurement, if actual interference was caused to viewers of WGAL or WBPH-TV. The second was to measure and report on any changes to signal reception of WUSA. The undersigned participated in the interference measurements while station personnel performed the tests documenting the actual changes in reception.

The off-air interference measurements were performed in selected locations where the interference study software predicted interference would occur. A television news truck outfitted with a telescoping mast was fitted with a high gain VHF antenna, typical of those employed by homeowners in rural areas distant from the TV station. The antenna was elevated to a level of 30 feet above ground. The antenna was rotated in the direction of the station being studied (either the desired or undesired signal). The signal was then viewed on a spectrum analyzer and the results recorded. If a signal adequate for reception was available, its strength was measured using a field strength meter and calibrated antenna². The signal was also viewed using a converter box, digital TV set, or Triveni Stream Scope as appropriate.

In three out of five measurement locations where WBPH-TV was predicted to receive interference, it was found that there was little or no measurable signal from WBPH-TV as indicated on the spectrum analyzer. The antenna was then rotated towards WUSA with no signal observed from WUSA operating at 52 kW. The WUSA power was then lowered as needed to 12.6 kW if a useable signal from WBPH-TV was observed. Where the WBPH-TV signal was observed, no interference from WUSA at 52 kW was detected.

Only one of the four measurement locations where WGAL was predicted to receive interference had sufficient signal strength to perform observations. At this location, proper reception of WGAL was observed in the presence of the higher power WUSA and WJLA-TV, Ch. 7, Washington, D.C.³. At the remaining locations only the tip of the “pilot” signal was indicated on the spectrum analyzer. There was no actual signal that could be measured or one that could be decoded by a digital TV set or converter box.

² Field strength measurements such as these have been taken over a 100 foot long portion of a radial from the transmitter. The field truck employed for these tests has a safety feature that prevents moving the vehicle when the mast is extended. In the past, OET has agreed that single point measurements would be acceptable for this type of exercise.

³ WJLA-TV also has an experimental authorization to operate at 52 kW ERP, see BDTSA-20090827ABP
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Before the experimental authorization was approved, WUSA personnel took a standard “rabbit-ears” style antenna to locations within the station’s coverage area. Using a converter box, digital television set, and a Triveni Stream Scope at these locations, the signal from WUSA was measured at various locations and a determination as to the viability of the reception was performed. In most locations, repeating these measurements after the WUSA power was increased indicated some improvement in actual reception.

After the power was increased in late December 2009, reports were received from viewers who could now receive WUSA where they were previously unable.

The results of the measurements indicate that in this case the prediction method employed by the Commission to determine coverage may overstate actual coverage and interference levels. In many areas where coverage is predicted, no useable signal was found. In certain cases, the predicted WUSA interfering signal simply did not exist at the authorized and experimental power levels.

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Detroit Free Press, Inc. (“DFP”) is the licensee of WUSA(TV), digital Channel 9, Facility ID 65593, Washington, D.C. On June 12, 2009, shortly after the station terminated pre-transition digital operation on UHF Channel 34 and commenced digital operation on high-band VHF Channel 9, viewers called to report that they could no longer receive the station. WUSA(TV) is authorized in the construction permit, BMPCDT-20080425ABL, for an effective radiated power (“ERP”) of 12.6 kW on Channel 9. The maximum ERP for high-band Zone I VHF stations like WUSA(TV) is 30 kW. Even at this power level, reception has been shown to be problematic. This situation is not unique, especially in Television Zone I where it has been demonstrated numerous times that authorized digital television power levels are insufficient to overcome building attenuation and localized noise sources when indoor antennas are employed.

Callers to the station that complained of lost coverage were counseled on re-scanning of converter boxes and TV sets as well as re-orientation of the indoor antenna, typically “rabbit-ears” style units¹. After applying these remedies, a few were able to receive the new Channel 9 digital signal while many others were not. Numerous possible solutions were studied. Considering the instant loss of viewers, one of the more practical remedies that might provide a coverage improvement in the shortest amount of time was an increase in power. Considering the maximum transmitter power output, an ERP of 52 kW using the existing transmission line and antenna was deemed possible. Accordingly, an experimental authorization (see BDSTA-20091218ACS) was requested and granted. The instant report documents the results of testing to date and supports a request for continued operation of WUSA(TV) at the elevated power level of 52 kW ERP.

Interference studies in accordance the Commission’s Office of Science and Technology Bureau’s Bulletin No. 69 (“OET-69”) were performed considering an experimental WUSA(TV)

¹ It should be noted that some callers were using the UHF only indoor antennas readily available at local electronic stores.

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operation at 52 kW ERP using the existing non-directional VHF antenna. The interference study indicated interference increases in excess of the Commission's new 0.5% interference limit to two stations, WGAL² and WBPH-TV³.

WGAL and WBPH-TV both agreed to accept the predicted interference on the condition of testing to determine the actual conditions. Representatives of both stations were notified prior to commencement of the tests as required in the experimental authorization and were also invited to observe.

Thus, the experimental authorization requires two sets of measurements. The first set of measurements was designed to determine the impact to WGAL and WBPH-TV. These second set of measurements was to determine improvement in actual coverage for WUSA(TV) resulting from the increase in power.

Method

The Commission's planning factors for digital television have always assumed the use of an outdoor receiving antenna with 6 dB of gain mounted about 30 feet (10 m) above ground level⁴. For the interference measurements, a high gain VHF antenna⁵ was mounted to the telescoping mast and elevated to the proper height. One end of a 50 foot long RG-6 cable was attached to the antenna while the other was attached to the input of a spectrum analyzer⁶. The spectrum analyzer plot was recorded on a laptop computer. Alternatively, the RG-6 cable could be connected to a Zenith DTV converter box⁷ or a Digital Stream converter box⁸ which in turn was connected to the analog antenna input of a television set, directly into digital television set⁹,

² Digital Channel 8, Facility ID 53930, Lancaster, PA.

³ Digital Channel 9, Facility ID 60850, Bethlehem, PA.

⁴ A downlead loss of 2 dB is also assumed by OET-69 for high-band VHF frequencies.

⁵ The antenna employed for the interference measurements was an Antennacraft HBU33. The antenna has a stated high-band VHF gain of 7.6 dB with a 20.4 dB front-to-back ratio.

⁶ A 50 ft RG-6 downlead was employed. The loss in this cable is approximately 2.5 dB at 189 MHz.

⁷ Model No. DTT900, Serial No. 804SHYD182610

⁸ Model No. DTX9950, Serial No. V0021512

⁹ Dynex LCD TV, Model No. DX-L19-10A

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or a Triveni Stream Scope¹⁰. A block diagram of the off-air interference test setup is provided in the attached **Figure 1**.

At locations of sufficient signal strength, a Potomac Instruments FIM-71 field intensity meter¹¹ was employed with its calibrated antenna mounted atop the telescoping mast extended to 30 feet above ground level. The resulting data was recorded and later employed to calculate the signal strength in accordance with the procedures set forth by the field intensity meter manufacturer¹².

To determine the location of the measurement points, an implementation of the Commission's Office of Engineering and Technology Bulletin No. 69 ("OET-69") software was employed to determine the predicted impact to the two affected stations. Employing certain input parameters, the software program provides mapping data that describes the location where coverage and interference is predicted. Employing this data, a map was prepared that depicted the locations of those areas (or cells) where interference to the affected stations was predicted. Measurement points were selected in the predicted clustered interference areas at locations where the truck could be safely parked and the mast extended¹³.

Interference Test Results – WBPH-TV

The first station affected by the WUSA(TV) experimental operation was WBPH-TV. Using the method described above, the locations where new interference was predicted to WBPH-TV from the WUSA(TV) experimental operation were plotted on a map (see **Figure 2**). As shown therein, the predicted interference locations are located between the predicted WBPH-TV service contour and the WBPH-TV principal community contour.

¹⁰ Model No. MT40, SN AEP07L0004

¹¹ FIM-71, Serial No. 597, Antenna, ANT-71, Serial No. 275, calibrated September 15, 2009.

¹² See Measuring Digital Television Field Strength Using The Potomac Instruments FIM-71 And FIM-72 Field Strength Meters, by Mr. Cliff Hall, December 19, 1997.

¹³ The point measurement and point selection methodology was previously employed for similar interference measurements.

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A description of the locations and other pertinent data for the WBPH-TV interference measurements are provided in **Table I**. As shown, signals were observed at some locations from WBPH-TV. **Figure 3** provides point description data for WBPH-TV measurement point 1. **Figure 4** provides the observed spectrum around Channel 9 (186 MHz to 192 MHz) at measurement point 1. At WBPH-TV measurement point 1¹⁴ no signal, except for the pilot, was observed from WBPH-TV. The WBPH-TV signal was insufficient for decoding by either the TV set or converter box. No signal was observed from WUSA(TV) at 52 kW.

In the same manner **Figures 5** and **6** provide the location data and measured spectrum observed at WBPH-TV measurement point 2; **Figures 7** and **8** provide the location data and measured spectrum for WBPH-TV measurement point 3; **Figures 9** and **10** provide the location data and measured spectrum for WBPH-TV measurement point 4, and **Figures 11** and **12** provide the location data and measured spectrum for WBPH-TV measurement point 5.

With the exception of WBPH-TV measurement points 2 and 4, no signals were observed from either station. At WBPH-TV measurement point 2, sufficient signal from WBPH-TV was observed to decode a picture using the TV set and the Triveni Stream Scope. The TV set decoded an acceptable picture with some pixelization. The Stream Scope indicated a signal to noise ratio of 12.6 dB. While making this observation, the transmitter power for WUSA(TV) was lowered to achieve an ERP of 12.6 kW. No change in the WBPH-TV signal to noise level was noted on the Stream Scope.

At WBPH-TV measurement point 4, sufficient signal from WBPH-TV was observed. The TV set was able to decode the data and display a program. The Stream Scope indicated a signal to noise ratio of 7.8. Since no signal from WUSA(TV) was observed, the antenna was raised from 30 feet above ground level to 49.5 feet. The antenna orientation was adjusted as needed. As expected the WBPH-TV signal level improved with the Stream Scope displaying an improved signal to noise ratio of 12.5 dB. It should be noted that no other Philadelphia area

¹⁴ On January 21, 2010, Mr. Larry H. Will, P.E., consultant for WBPH-TV, observed the measurements at WBPH-TV measurement points 1 and 2. On January 25, 2010, Mr. Will and Mr. Daniel Huber from WBPH-TV observed measurements at WBPH-TV measurement points 4 and 5.

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stations were observed on the television set. In fact, several setup scans of the TV set only showed the WBPH-TV signal.

Interference Test Results – WGAL

The second station affected by the proposed WUSA(TV) experimental operation was WGAL. Using the same method described employed for WBPH-TV, the locations where new interference was predicted to WGAL from the WUSA(TV) experimental operation were plotted on a map (see **Figure 13**). As shown, most of the predicted interference locations are between the predicted WGAL service contour and the WGAL principal community contour. Some interference locations are predicted within the WGAL principal community contour.

A description of the locations and other pertinent data are provided in **Table II**. As shown, with the exception of WGAL measurement point 1, no useable signals were observed from WGAL. **Figure 14** provides point description data for WGAL measurement point 1. **Figure 15** provides the observed spectrum around Channel 8 (180 MHz to 186 MHz). At WGAL measurement point 1, a good signal was observed for WGAL. The signal level was sufficient to receive a usable signal from WGAL using the converter box, digital TV set and Stream Scope. The TV set displayed a good signal (picture and sound). The Zenith converter box displayed a good picture with a 50% signal level indicated. The Digital Stream converter box did not fare as well indicating a 30% signal level and displaying an intermittent signal. These observations were made with WUSA(TV) and WJLA-TV, Channel 7, Facility ID 1051, Washington, D.C. both operating at 52 kW ERP¹⁵.

In the same manner **Figures 16** and **17** provide the location data and measured spectrum observed at WGAL measurement point 2; **Figures 18** and **19** provide the location data and measured spectrum for WGAL measurement point 3, and **Figures 20** and **21** provide the location data and measured spectrum for WGAL measurement point 4. At WGAL measurement points 2, 3, and 4 only the WGAL pilot signal was visible.

¹⁵ WJLA-TV is also authorized to operate at 52 kW ERP, see BDSTA-20090827ABP.

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At WGAL measurement point 2, we noted that the TV set was able to receive an adequate signal from WUSA(TV) using a “rabbit-ears” style antenna. Even with WUSA(TV) operating at 52 kW ERP, the picture would go in and out of lock.

WUSA(TV) Signal Measurements

With WUSA(TV) operating as authorized at 12.6 kW ERP, a series of locations were randomly selected and visited by station staff. The test equipment employed for these reception tests included only “rabbit-ears” style antenna connected to a digital TV set (the typical home viewing setup). The “rabbit-ears” style antenna was also employed with the Triveni Stream Scope. The antenna was positioned approximately 8 feet above ground level atop one of the station’s vans. Reception of WUSA(TV) was attempted at each point.

After the WUSA(TV) power was increased to 52 kW ERP, the same locations, as well as some additional sites, were visited with the same reception test setup. Of those locations visited where a signal was previously received, an improvement in signal to noise ratio was observed, see **Table III**. The measurement locations are depicted in **Figure 22**.

Most notable, are reports from viewers and observations made by the undersigned. From the first floor of a private home located approximately 7.8 miles from the WUSA(TV) transmitter site, observations were performed before and after the power increase. Using the same Zenith converter box employed for the interference measurements along with a “rabbit-ears” style antenna, there was insufficient signal from WUSA(TV) at 12.6 kW ERP for the converter box to recognize the signal during a scan. After the power increase, the same test setup was employed and easily scanned WUSA(TV) and displayed a clear program.

From an adjacent home, an unsolicited report was received. That home employed a digital television set located in the first floor kitchen using a “rabbit-ears” style antenna. Prior to

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the power increase, WUSA(TV) could not be received. After the power increase, the same receiver/antenna combination had no difficulty in receiving WUSA(TV)¹⁶.

The station also provided reports from viewers. One viewer in Oakton, Virginia (about 12 miles from the transmitter) was unable to receive WUSA(TV) after the digital transition in June 2009. After the power increase, the viewer reported that they could receive WUSA(TV) without any problems.

Another viewer in the Oakton area using an antenna mounted in their attic reported that they were unable to receive Channel 9 after the digital transition date in 2009. After WUSA(TV) increase its power in December 2009, the same viewer reports they can now receive Channel 9 with solid signal.

An unsolicited report was received by WUSA(TV) from a viewer in Chambersburg, PA which reported newly found reception of Channel 9's digital signal after the power increase where there was previously no reception.

Conclusions

It appears that in this case the Commission's method for evaluating digital television coverage tends to overstate the actual conditions. The OET-69 software program employs the station's service contour as the study boundary. It is believed that the actual coverage area achieved is much less than expected using presently employed prediction criteria and planning factors.

Throughout the digital television transition, the Commission has routinely employed the standard propagation method ("curves") to determine and compare coverage. The method of signal prediction considers only the average terrain within a two to ten mile annulus from the transmitter site with an assumption of terrain roughness of 50 meters. Terrain obstacles outside this distance limitation are ignored. For example, where the terrain is flat, the coverage is

¹⁶ It should also be noted that WJLA-TV operating at 30 kW ERP could not be received until the station increased its power to 52 kW.

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predicted to extend great distances even past the radio horizon¹⁷. While this method may have proved adequate for placement of analog transmitter sites, it may be overstating the area where actual digital reception by the public is possible due to the “cliff-effect” nature of the ATSC system.

For example, OET-69 predicted the existence of coverage with a signal level of 42.7 dBμ at WBPH-TV measurement point 1 which is located 57.0 km from the WBPH-TV transmitter site and well past the radio horizon. Earth curvature plays a role in propagation at this distance and frequency. Further, if the software calculations are to be believed, a signal level in excess of 28 dBμ should have been present from WUSA(TV) for the locations (cells) to be tagged as receiving interference. However, no actual signal from WUSA(TV) was observed. WUSA(TV) is 173 km from WBPH-TV measurement point 1 and well past the radio horizon.

Likewise, the measurements for WGAL indicated signal levels well below that predicted by the OET-69 software. In fact, where OET-69 predicts a signal level of 45.47 dBμ at WGAL measurement point 2, the actual signal level was sufficiently low to be almost unreadable on the spectrum analyzer. The signal was insufficient for recognition by a DTV converter box with a high-gain antenna 30 feet above ground level. WGAL measurement point 2 is located 93.7 km from the WGAL transmitter site. Here again, earth curvature is believed to play a role.

It appears from the collected data that overstatement of coverage contained in the coverage/interference prediction model may have led to lower power levels for many stations, especially those in TV Zone I. Add in the impact of building structures and foliage that attenuate the signals further combined with electrical noise from other equipment and indoor reception becomes difficult if not impossible.

As shown in **Figure 22** and **Table III**, increasing WUSA(TV)’s ERP from 12.6 kW (well below the maximum permitted in TV Zone 1) to 52 kW provided a substantial improvement in actual reception of the WUSA(TV) digital signal. This was indicated by the station’s tests using an inefficient “rabbit-ears” style antenna close to the ground. Additionally, reports from

¹⁷ The radio horizon is the location where the direct signal from the antenna becomes tangential to the surface of the Earth.

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viewers were received indicating that they are now able to view WUSA(TV)'s programming where they were unable to before the power increase.

It is believed that continued operation of WUSA(TV) at 52 kW ERP is warranted due to the substantial increase in reception of the station's digital signal. Additional power may be required to restore off-air viewing to those viewers who are still unable to receive WUSA(TV)'s digital signal. Further, the measurements documented herein demonstrated that the stations predicted to receive interference by the Commission's OET-69 software are clearly not harmed. In fact, both stations predicted to receive interference had limited reception due to low desired station signal levels or no measurable signals at all within the predicted coverage areas.

Certification

The undersigned hereby certifies that the foregoing statement and exhibits were prepared by him or under his direction, and that it is true and correct to the best of his knowledge and belief. Mr. Mertz is a principal in the firm of *Cavell, Mertz & Associates, Inc.*, holds a Bachelor of Science degree from Oglethorpe University, and has submitted numerous engineering exhibits to the Federal Communications Commission. His qualifications are a matter of record with that agency.



Richard H. Mertz
June 4, 2010

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FIGURE 2
MEASUREMENT LOCATIONS
AND WBPH-TV (LIC) PREDICTED
DIGITAL INTERFERENCE ATTRIBUTABLE TO
EXPERIMENTAL WUSA(TV) FACILITY

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Cavell, Mertz & Associates, Inc.
Manassas, Virginia

WBPH-TV Lic
(BLCDT-20060609AAH)
Ch. 9 3.2 kW (MAX-DA) 284 m
Service Contour
Principal Community Contour

Predicted area of new digital interference from WUSA(TV) experimental facility

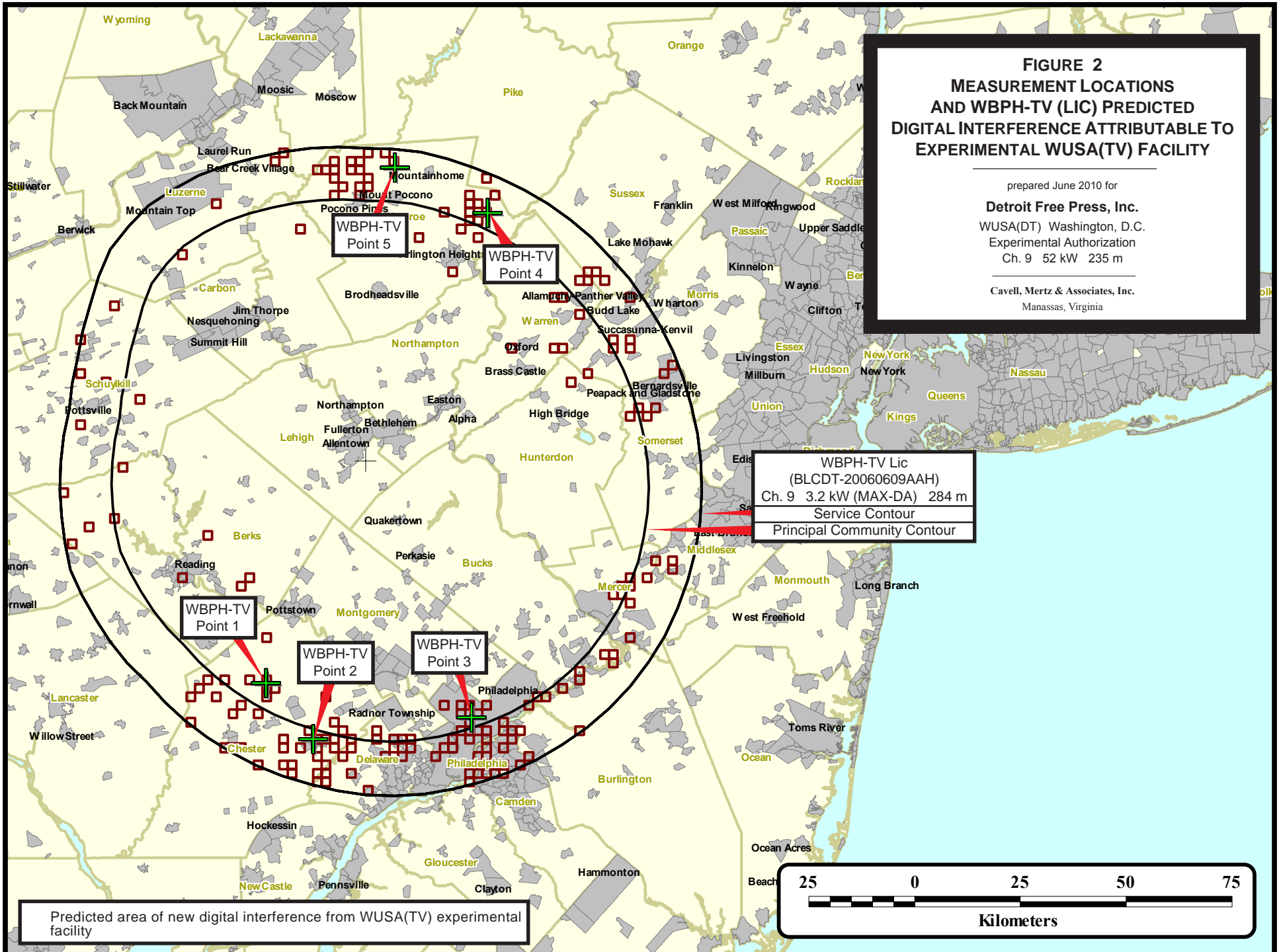
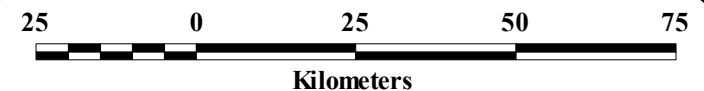
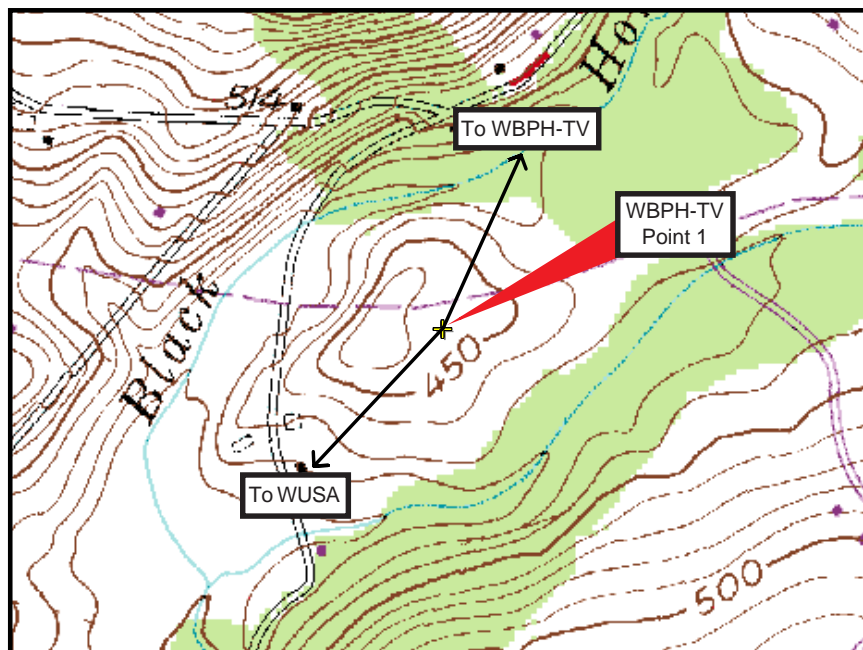
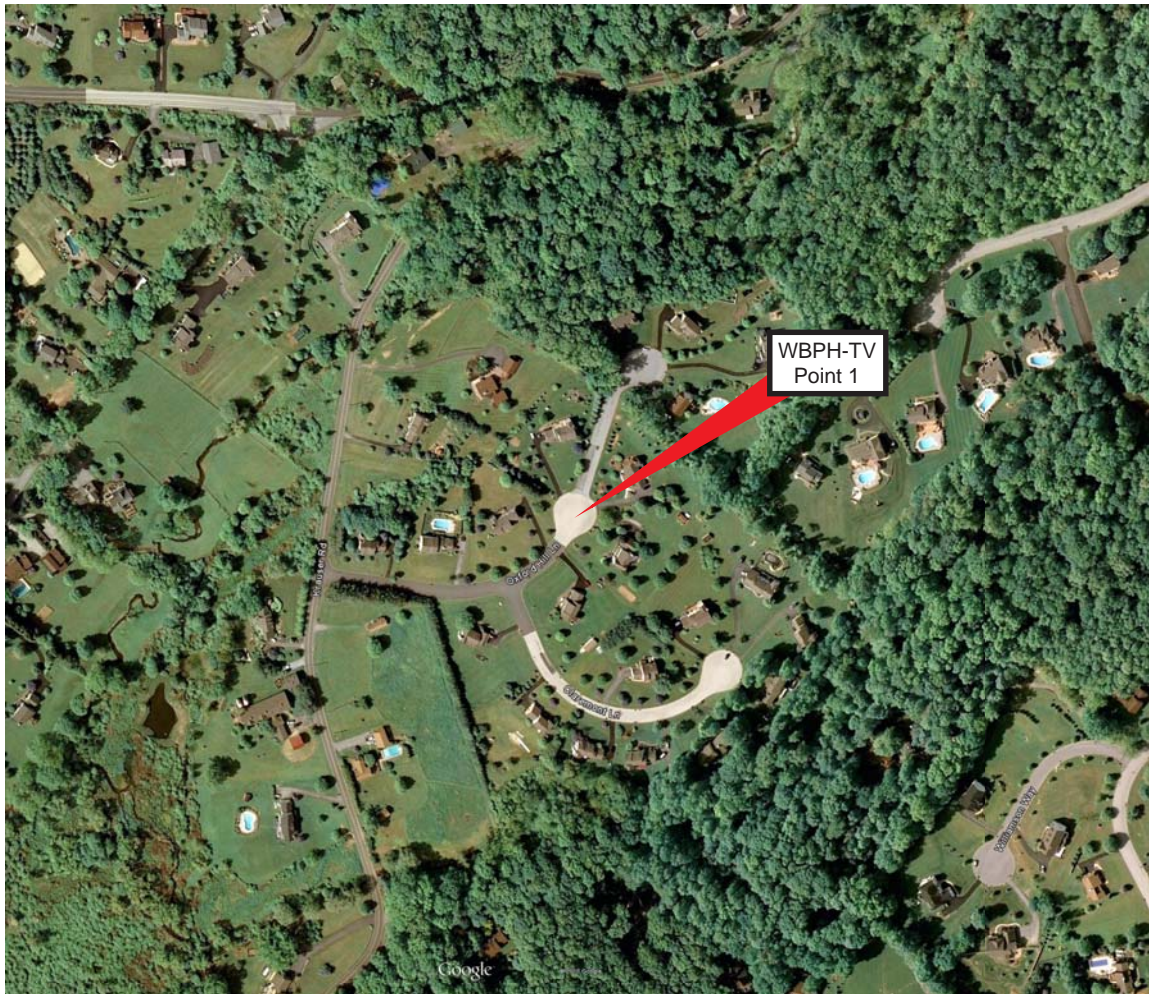


Table 1
WUSA TO WBPH-TV INTERFERENCE MEASUREMENT RESULTS
 prepared for
Detroit Free Press, Inc.
 WUSA(TV) Washington, D.C.
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	<u>WBPH-TV Point 1</u>	<u>WBPH-TV Point 2</u>	<u>WBPH-TV Point 3</u>	<u>WBPH-TV Point 4</u>	<u>WBPH-TV Point 5</u>
Date	January 21, 2010	January 21, 2010	January 21, 2010	January 25, 2010	January 25, 2010
Time	12:13 PM	2:35 PM	5:25 PM	3:53 PM	2:20 PM
Address	Cul-de-sac in front of private home 108 Oxford Hill Lane Downingtown, PA 40° 05' 47.07" N 75° 42' 57.23" W	In front of private home 110 Afton Way West Chester, PA 39° 58' 39.38" N 75° 35' 04.16" W	N. 10th Street, half way between W. Courtland and W. Wyoming Philadelphia 40° 01' 22.10" N 75° 08' 28.36" W	Cul-de-sac at the end of Buroojy Ct. East Stroudsburg, PA 41° 05' 40.38" N 75° 05' 49.93" W	Shopping center parking lot off Sterling Road Tobyhanna, PA 41° 11' 26.62" N 75° 21' 20.11" W
Latitude (NAD-27)					
Logitude (NAD-27)					
Site elevation (in feet AMSL from topo map)	456	475.7	95.1	898.6	2083.3
Antenna elevation (in feet AMSL)	486	505.7	125.1	928.6	2113.3
Distance to WBPH -TV (in km)	57.01	66.15.	65.23	65.6	71.3
Azimuth to WBPH-TV (in degrees)	24.16	10.49	337.17	206.18	185.39
Distance to WUSA (in km)	173.05	172.15	205.1	292.1	290.92
Azimuth to WUSA (in degrees)	222.98	228.81	234.98	215.94	210.83
tv_process predicted signal strength (in dBμ)	42.73	43.08	38.56	42.19	37.91 (see note)
WBPH-TV measured signal	--	52.15	--	--	--
WUSA at 12.6 kW measured signal	--	--	--	--	--
WUSA at 52 kW measured signal	--	--	--	--	--
WBPH-TV signal observed	--	Good	--	see below	--
WUSA at 12.6 kW observed signal	--	--	--	--	--
WUSA at 52 kW observed signal	--	--	--	--	--
Triveni Stream Scope SN in db for WBPH-TV	--	12.6	--	7.8 (antenna at 30ft AGL)	--
Triveni Stream Scope SN in db for WUSA	--	--	--	--	--
Zenith coverter box signal level/picture quality - WBPH-TV	--	--	--	Good with some dropouts	--
Digital Stream coverter box signal level/picture quality - WBPH-TV	--	--	--	Some dropouts	--
Dynex receiver picture quality - WBPH-TV	--	Good	--	Good	--
Weather	Clear	Clear	Clear	Cloudy	Clouds / Rain
Temperature (in degrees F)	45	45	40	49	45
	No visible signal for either station. Could see WBPH pilot above the noise.	No change in Triveni SN for WBPH with WUSA at 12.6 kW or 52 kW. Some occasional packet errors were noted.	No signal from either station.	The mast was raised to 49.5 feet AGL. Triveni SN for WBPH was then 12.5 dB. The Digital Stream converter box signal went from 30 to 36 when the mast was raised to 49.5 ft.	This point is outside the predicted interference cell. The interference cells are in a gated community. Local law enforcement would not permit measurements within the gated area. The selected site is the nearest, open site available.

FIGURE 3
WBPH-TV MEASUREMENT POINT 1
LOCATION MAP

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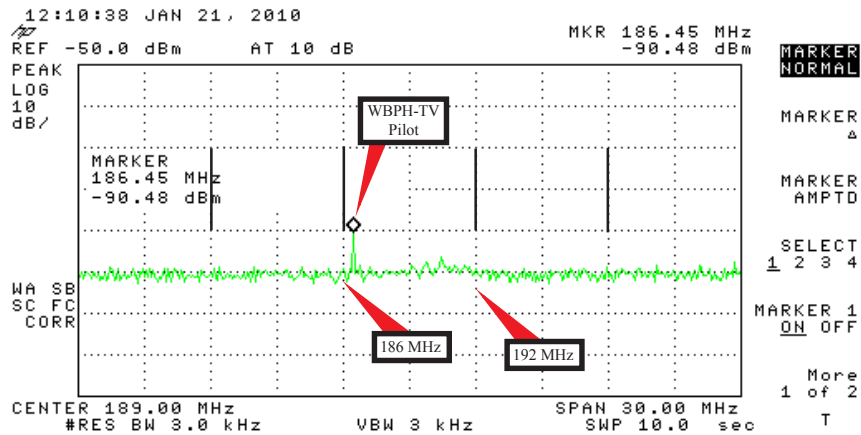


Cavell, Mertz & Associates, Inc.

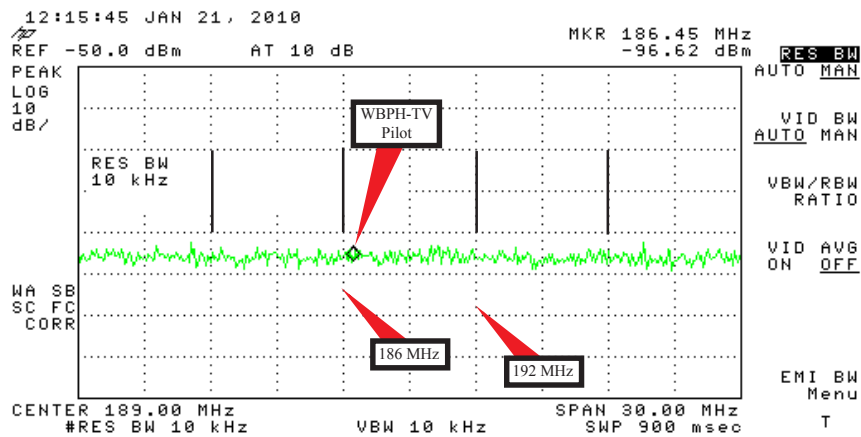
FIGURE 4 SPECTRAL PLOTS - WBPH POINT 1

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Experimental Authorization
Ch. 9 52 kW 235 m



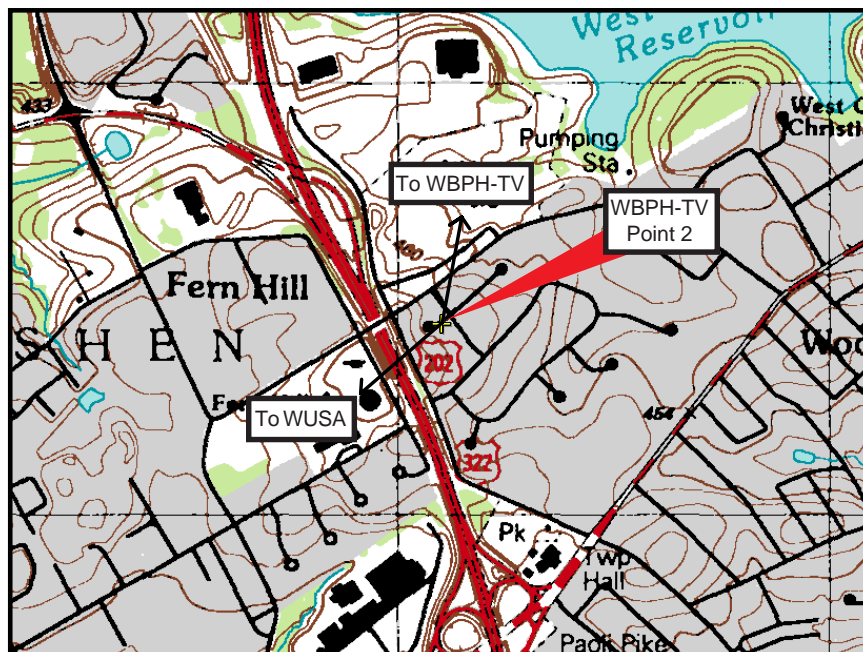
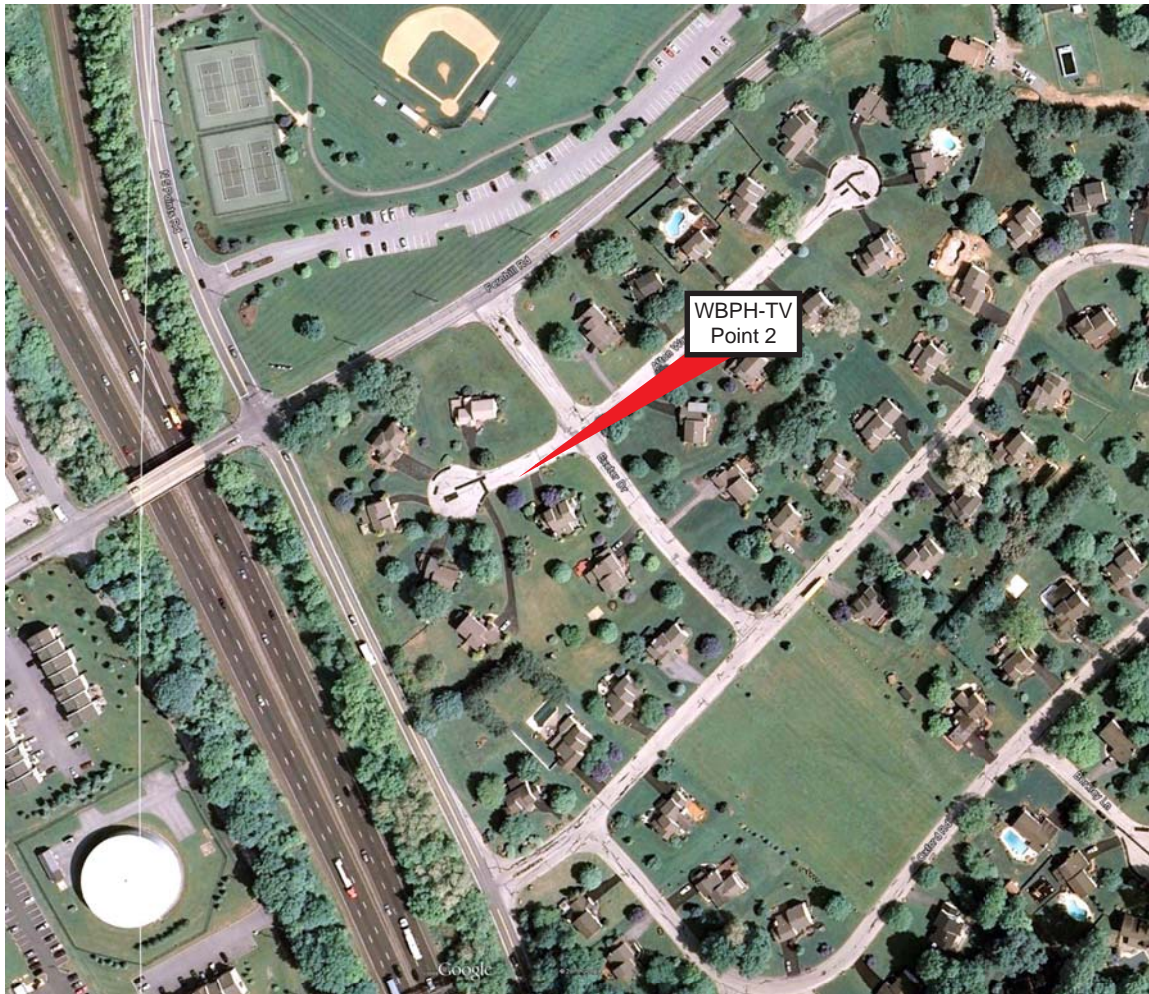
WBPH-TV Point 1 - Plot 1 - High gain antenna oriented towards WBPH-TV



WBPH-TV Point 1 - Plot 2 - High gain antenna oriented towards WUSA operating at 52 kW ERP

FIGURE 5
WBPH-TV MEASUREMENT POINT 2
LOCATION MAP

prepared June 2010 for
Detroit Free Press, Inc.
WUSA(TV) Washington, D.C.
Experimental Authorization
Ch. 9 52 kW 235 m

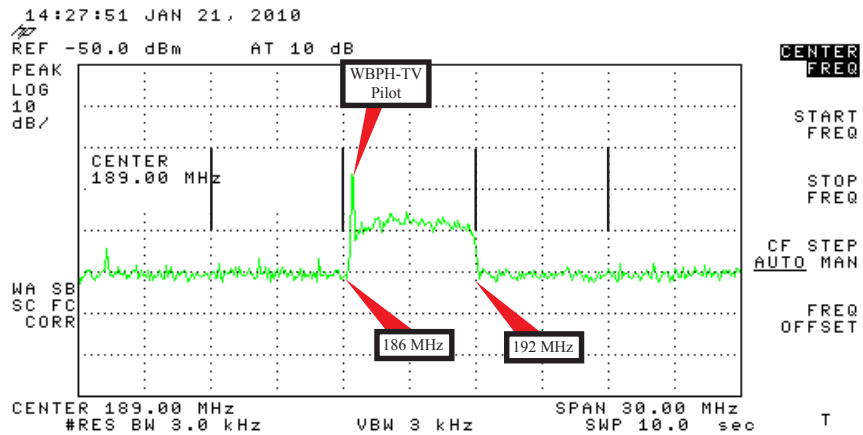


Cavell, Mertz & Associates, Inc.

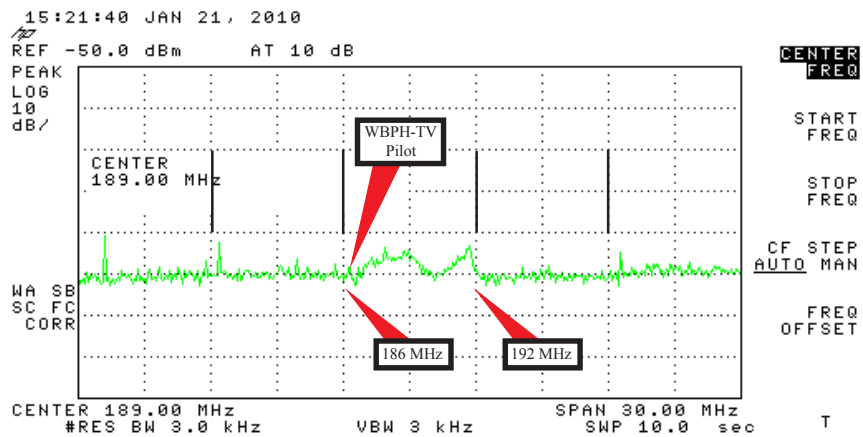
FIGURE 6 **SPECTRAL PLOTS - WBPH POINT 2**

prepared June 2010 for

Detroit Free Press, Inc.
WUSA(TV) Washington, D.C.
 Experimental Authorization
 Ch. 9 52 kW 235 m



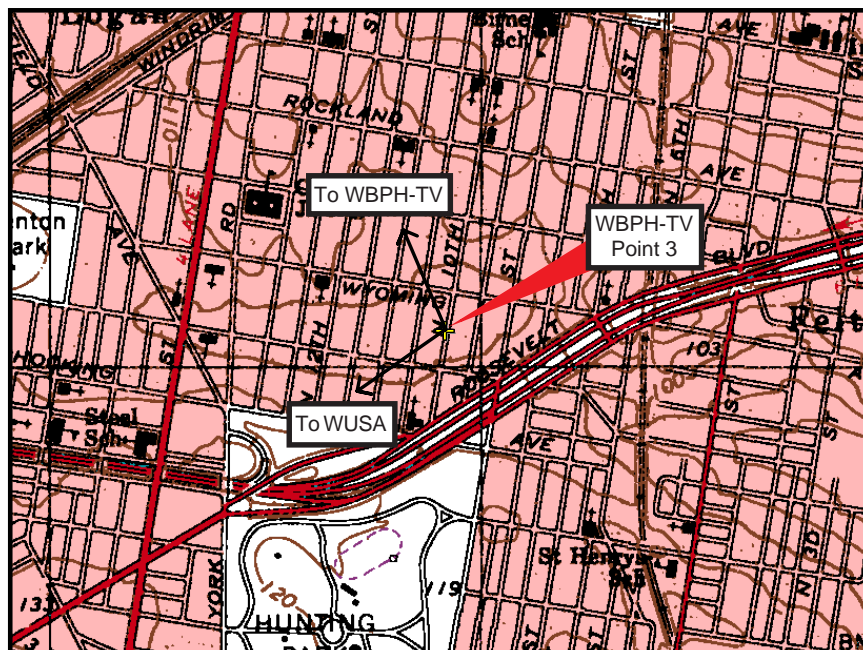
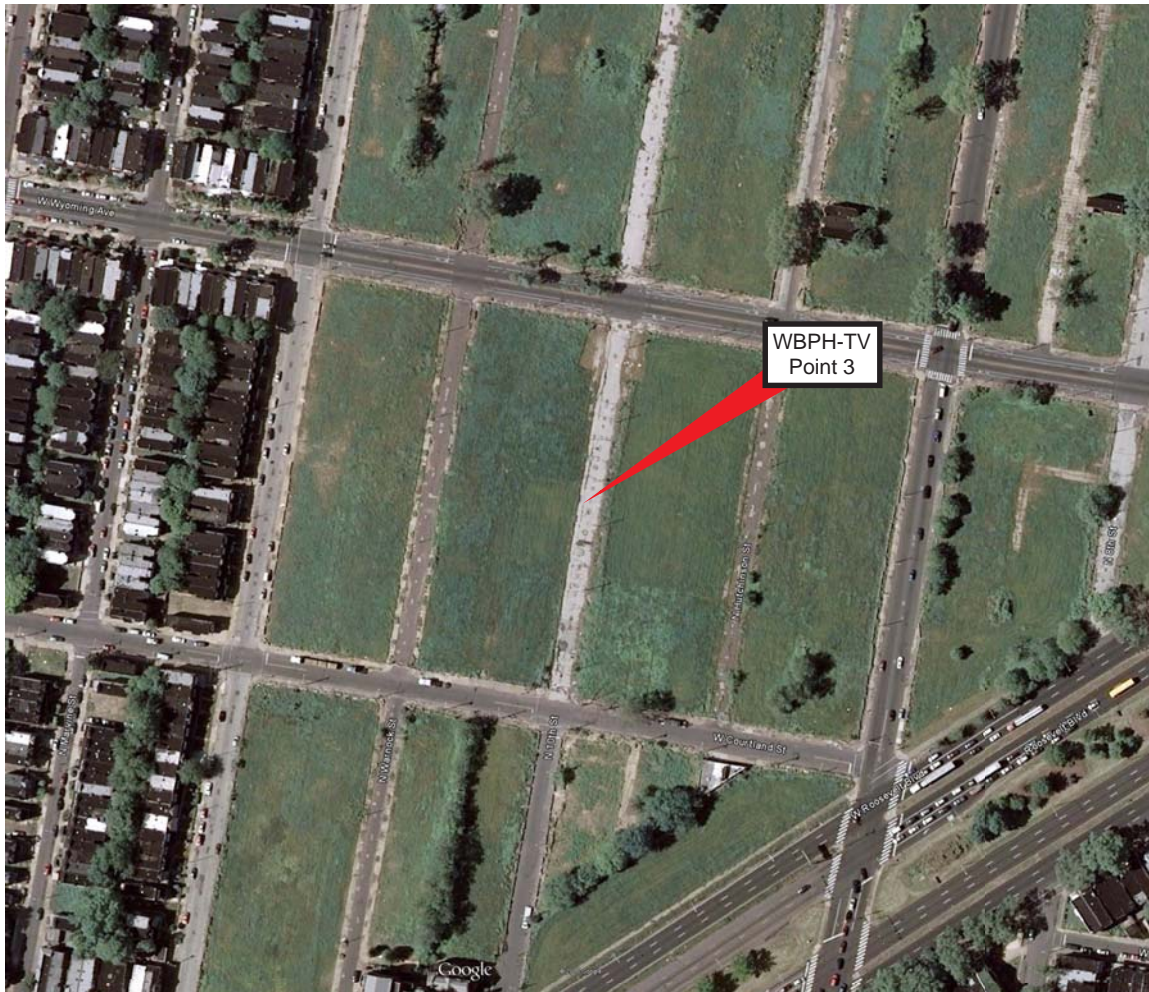
WBPH-TV Point 2 - Plot 1 - High gain antenna oriented towards WBPH-TV



**WBPH-TV Point 2 - Plot 2 - High gain antenna oriented towards WUSA
operating at 52 kW ERP**

FIGURE 7
WBPH-TV MEASUREMENT POINT 3
LOCATION MAP

prepared June 2010 for
Detroit Free Press, Inc.
WUSA(TV) Washington, D.C.
Experimental Authorization
Ch. 9 52 kW 235 m

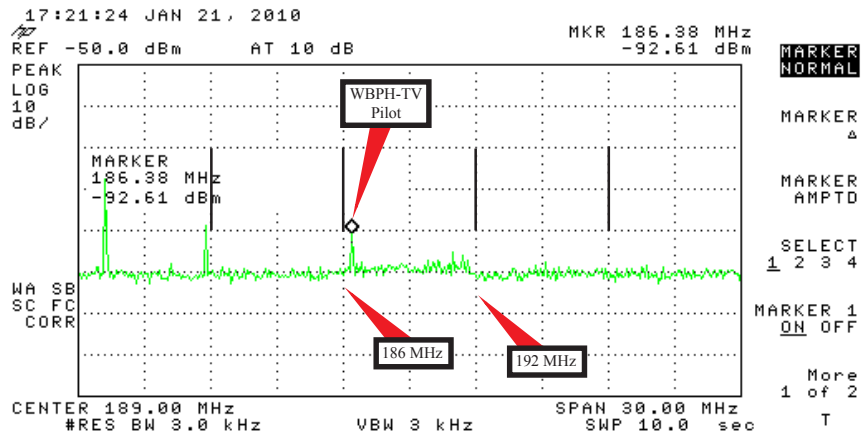


Cavell, Mertz & Associates, Inc.

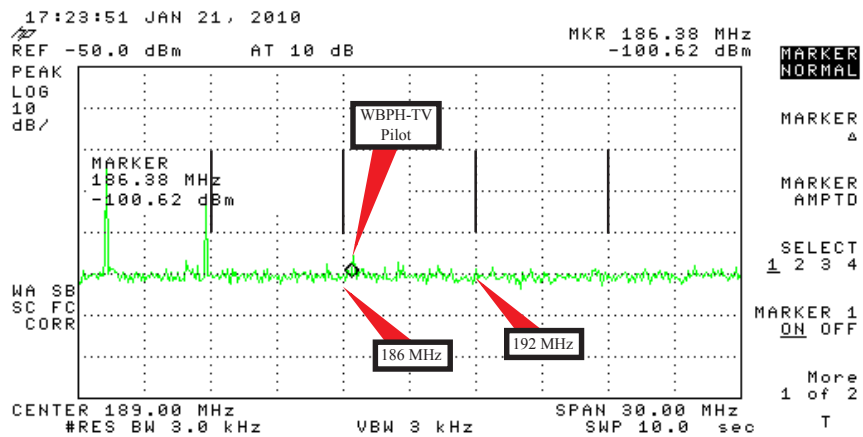
FIGURE 8 **SPECTRAL PLOTS - WBPH POINT 3**

prepared June 2010 for

Detroit Free Press, Inc.
WUSA(TV) Washington, D.C.
Experimental Authorization
Ch. 9 52 kW 235 m



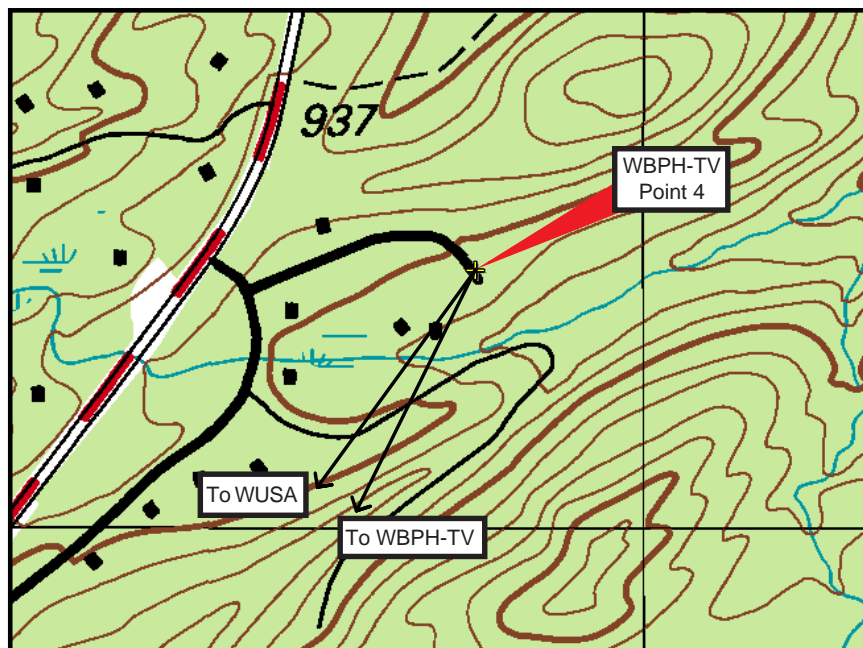
WBPH-TV Point 3 - Plot 1 - High gain antenna oriented towards WBPH-TV



WBPH-TV Point 3 - Plot 2 - High gain antenna oriented towards WUSA operating at 52 kW ERP

FIGURE 9
WBPH-TV MEASUREMENT POINT 4
LOCATION MAP

prepared June 2010 for
Detroit Free Press, Inc.
WUSA(TV) Washington, D.C.
Experimental Authorization
Ch. 9 52 kW 235 m

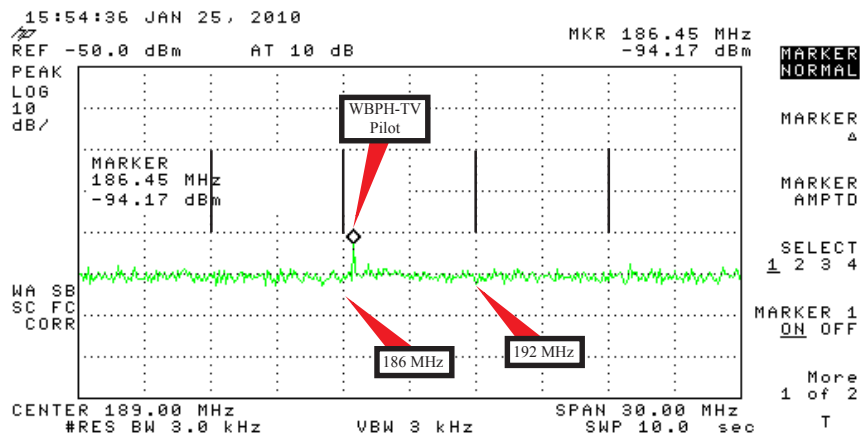


Cavell, Mertz & Associates, Inc.

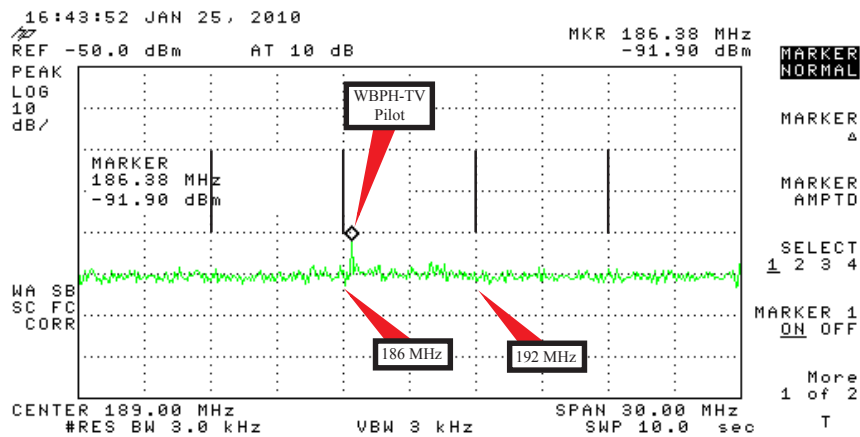
FIGURE 10 SPECTRAL PLOTS - WBPH POINT 4

prepared June 2010 for

Detroit Free Press, Inc.
WUSA(TV) Washington, D.C.
Experimental Authorization
Ch. 9 52 kW 235 m



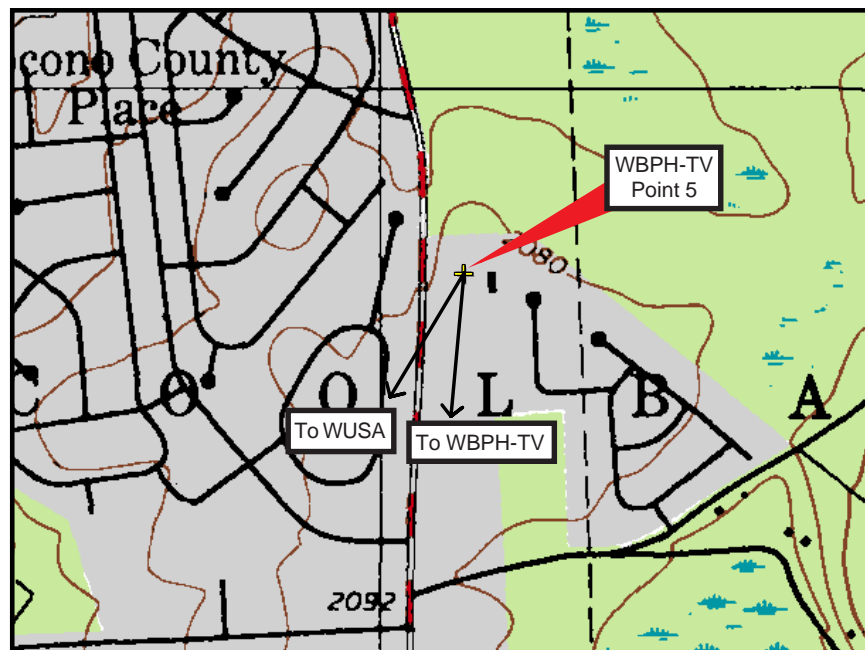
WBPH-TV Point 4 - Plot 1 - High gain antenna oriented towards WBPH-TV



WBPH-TV Point 4 - Plot 2 - High gain antenna oriented towards WBPH-TV
with mast extended to 50 ft above ground level

FIGURE 11
WBPH-TV MEASUREMENT POINT 5
LOCATION MAP

prepared June 2010 for
Detroit Free Press, Inc.
WUSA(TV) Washington, D.C.
Experimental Authorization
Ch. 9 52 kW 235 m

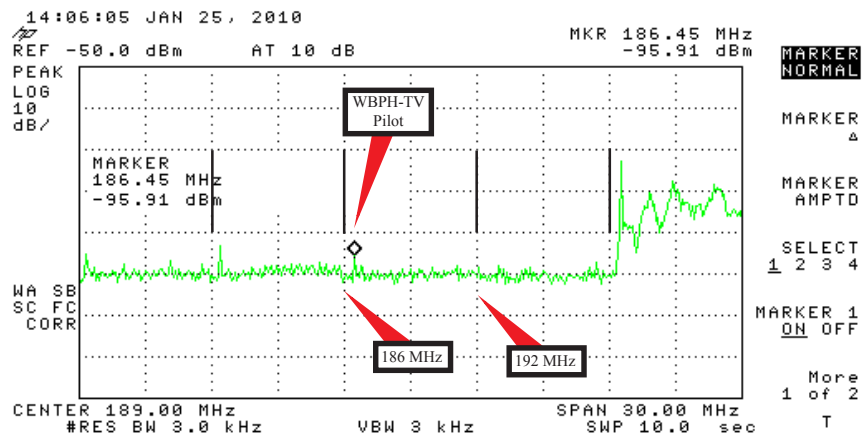


Cavell, Mertz & Associates, Inc.

FIGURE 12 SPECTRAL PLOTS - WBPH POINT 5

prepared June 2010 for

Detroit Free Press, Inc.
WUSA(TV) Washington, D.C.
Experimental Authorization
Ch. 9 52 kW 235 m



WBPH-TV Point 5 - Plot 1 - High gain antenna oriented towards WBPH-TV

FIGURE 13 **MEASUREMENT LOCATIONS** **AND WGAL(CP) PREDICTED** **DIGITAL INTERFERENCE ATTRIBUTABLE TO** **EXPERIMENTAL WUSA(DT) FACILITY**

prepared June 2010 for

Detroit Free Press, Inc.
WUSA-DT Washington, D.C.
Experimental Authorization
Ch. 9 52 kW 235 m

Cavell, Mertz & Associates, Inc.
Manassas, Virginia

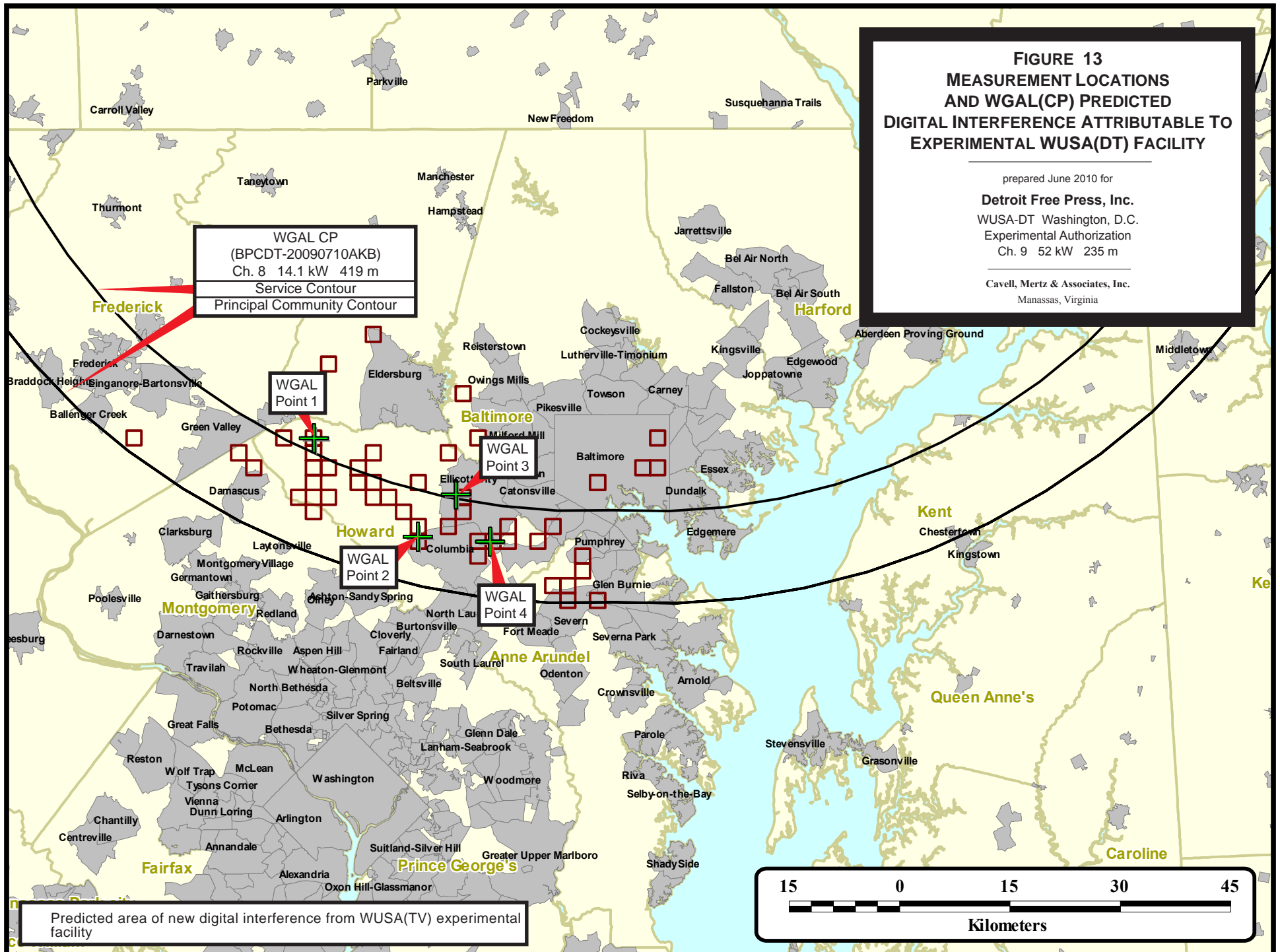


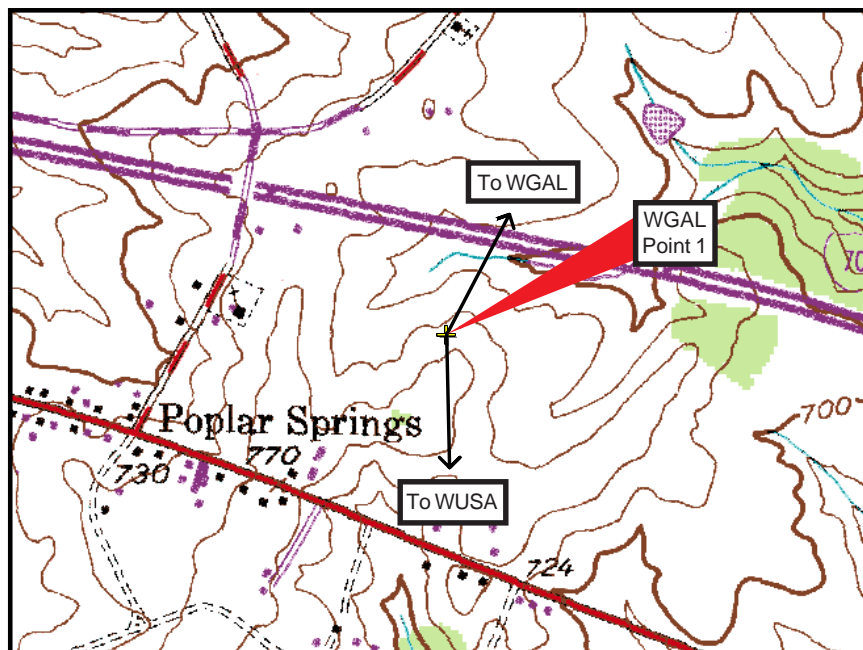
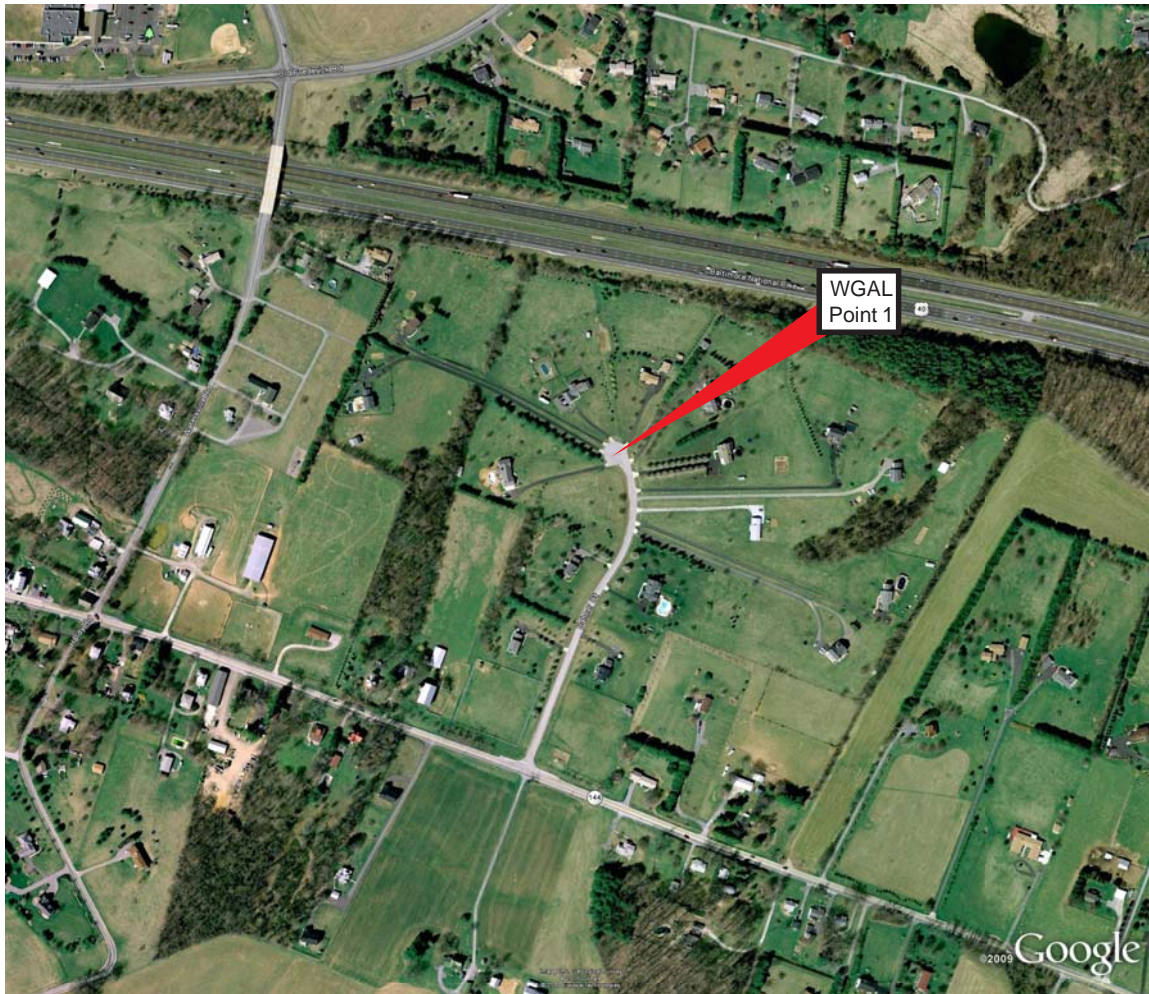
Table II
WUSA TO WGAL INTERFERENCE MEASUREMENT RESULTS
prepared for
Detroit Free Press, Inc.
WUSA(TV) Washington, D.C.
Experimental Authorization
Ch. 9 52 kW 235 m

	<u>WGAL Point 1</u>	<u>WGAL Point 2</u>	<u>WGAL Point 3</u>	<u>WGAL Point 4</u>
Date	January 20, 2010	January 20, 2010	January 20, 2010	January 21, 2010
Time	10:50 AM	3:30 PM	4:30 PM	9:00 AM
Address	Cul-de-sac in front of private home 16654 Bahner Court Mt. Airy, Maryland	Cul-de-sac in front of private home 11918 Evening Court Clarksville, Maryland	Cul-de-sac in front of private home 10248 Fairway Drive Ellicott City, Maryland	Cul-de-sac in front of private home 5656 Roundtree Lane Columbia, Maryland
Latitude (NAD-27)	39° 20' 42.49" N	39° 13' 29.20" N	39° 16' 35.42" N	39° 13' 6.95" N
Longitude (NAD-27)	77° 05' 23.94" W	76° 55' 32.27" W	76° 51' 57.12" W	76° 48' 41.07" W
Site elevation (in feet AMSL from topo map)	751.3	449.5	393.7	495.4
Antenna elevation (in feet AMSL)	781.3	479.5	423.7	525.4
Distance to WGAL (in km)	86.55	93.67	86.78	92.08
Azimuth to WGAL (in degrees)	27.59	16.17	14	10.24
Distance to WUSA (in km)	43.83	33.26	40.7	37.6
Azimuth to WUSA (in degrees)	178.84	203.59	207.03	217.61
tv_process predicted signal strength (in dBμ)	47.25	45.47	36.55	50.50
WGAL measured signal	52.17	--	--	--
WUSA at 12.6 kW measured signal	--	--	--	--
WUSA at 52 kW measured signal	79.95	68.45	61.45	86.55
WGAL signal observed	Good	--	--	--
WUSA at 12.6 kW observed signal	--	--	--	--
WUSA at 52 kW observed signal	Good	Good	Good /some dropouts on Dynex TV	Good
Triveni Stream Scope SN in db for WGAL	15.9	--	--	--
Triveni Stream Scope SN in db for WUSA	30.8	--	16 (using "rabbit-ears" antenna)	28.3 (using "rabbit-ears" antenna)
Zenith converter box signal level/picture quality - WGAL	50% / ok	--	--	--
Digital Stream converter box signal level/picture quality - WGAL	31% / intermittent	--	--	--
Dynex receiver picture quality - WGAL	ok	--	--	--
Weather	Clear	Clear	Clear	Clear
Temperature (in degrees F)	39	40	38	35

WUSA signal on Dynex TV went in
and out of lock using "rabbit-ears"
antenna.

FIGURE 14
WGAL MEASUREMENT POINT 1
LOCATION MAP

prepared June 2010 for
Detroit Free Press, Inc.
WUSA(TV) Washington, D.C.
Experimental Authorization
Ch. 9 52 kW 235 m

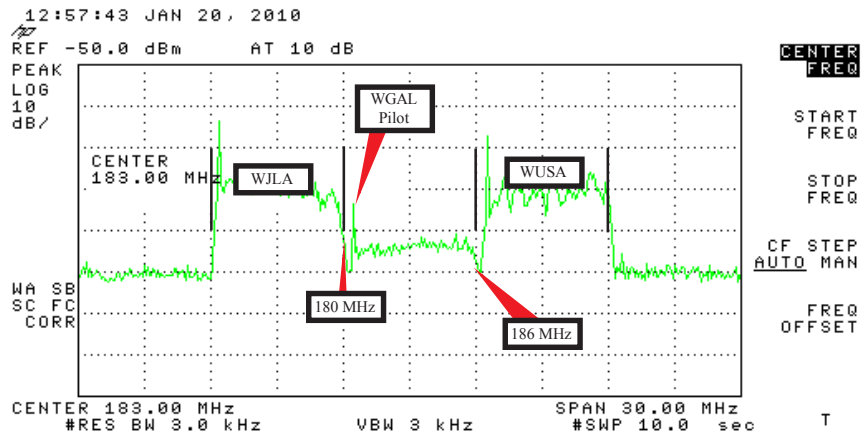


Cavell, Mertz & Associates, Inc.

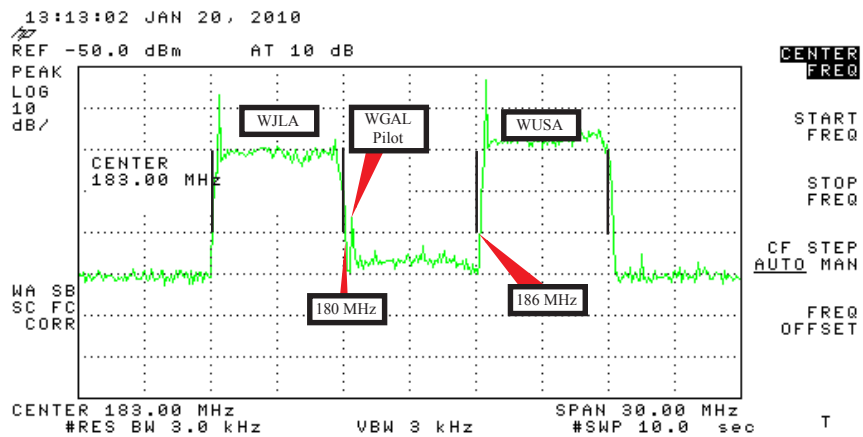
FIGURE 15 SPECTRAL PLOTS - WGAL POINT 1

prepared June 2010 for

Detroit Free Press, Inc.
WUSA(TV) Washington, D.C.
Experimental Authorization
Ch. 9 52 kW 235 m



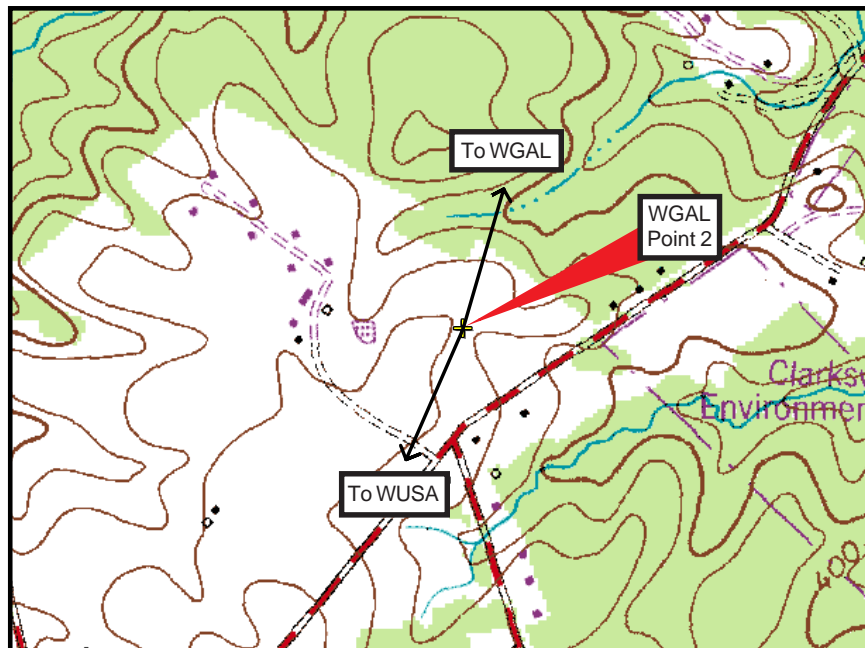
WGAL Point 1 - Plot 1 - High gain antenna oriented towards WGAL



**WGAL Point 1 - Plot 2 - High gain antenna oriented towards WUSA
operating at 52 kW ERP**

FIGURE 16
WGAL MEASUREMENT POINT 2
LOCATION MAP

prepared June 2010 for
Detroit Free Press, Inc.
WUSA(TV) Washington, D.C.
Experimental Authorization
Ch. 9 52 kW 235 m

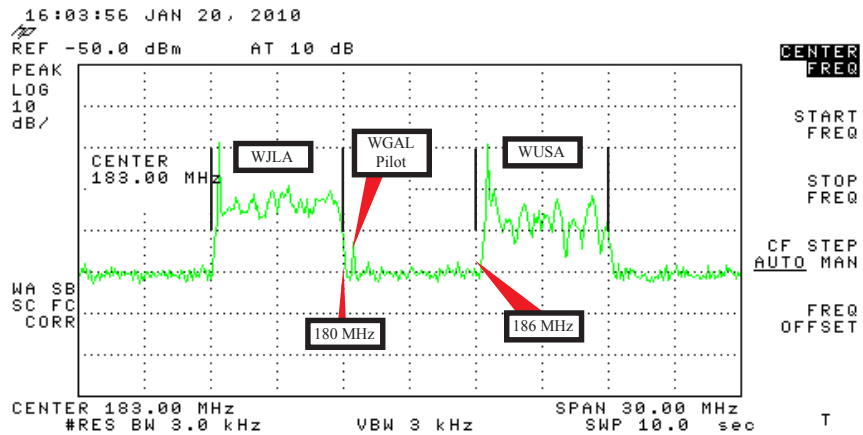


Cavell, Mertz & Associates, Inc.

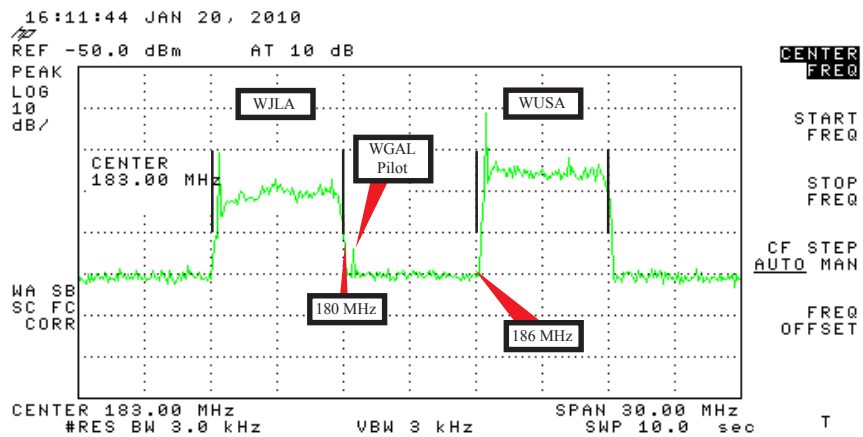
FIGURE 17 SPECTRAL PLOTS - WGAL POINT 2

prepared June 2010 for

Detroit Free Press, Inc.
WUSA(TV) Washington, D.C.
Experimental Authorization
Ch. 9 52 kW 235 m



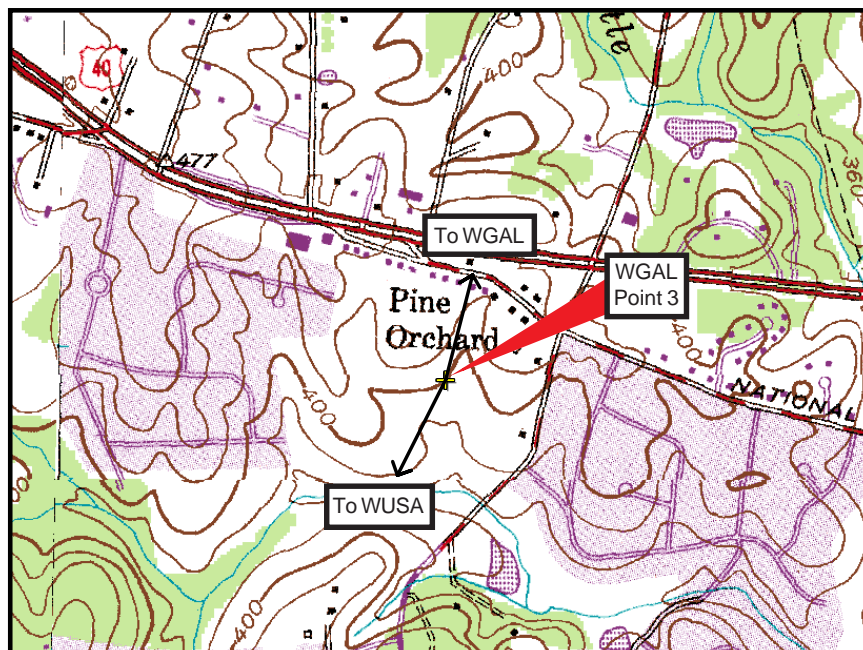
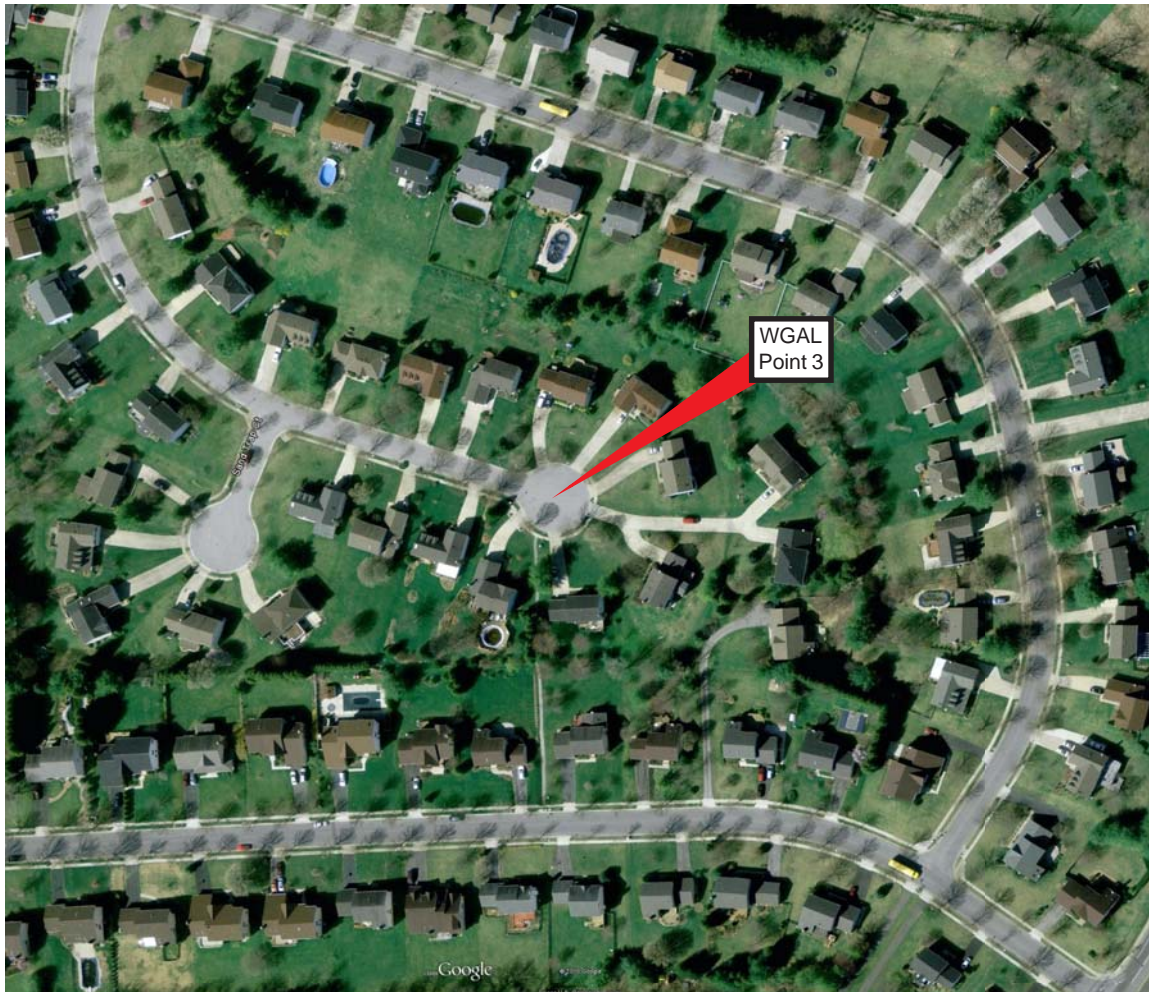
WGAL Point 2 - Plot 1 - High gain antenna oriented towards WGAL



**WGAL Point 2 - Plot 2 - High gain antenna oriented towards WUSA
operating at 52 kW ERP**

FIGURE 18
WGAL MEASUREMENT POINT 3
LOCATION MAP

prepared June 2010 for
Detroit Free Press, Inc.
WUSA(TV) Washington, D.C.
Experimental Authorization
Ch. 9 52 kW 235 m

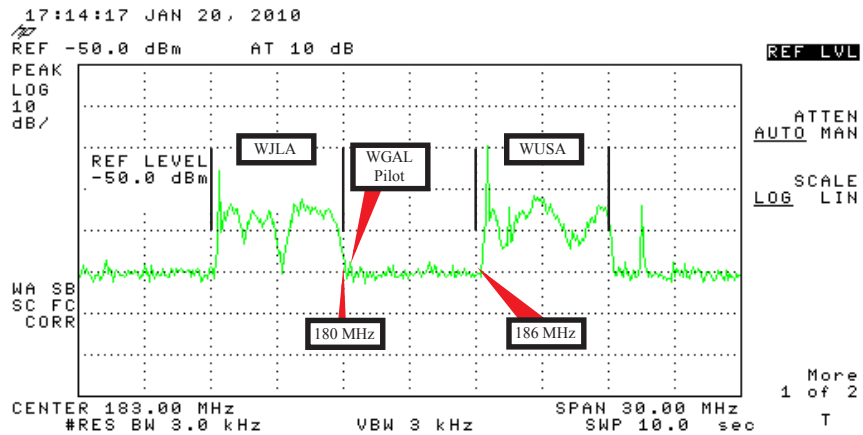


Cavell, Mertz & Associates, Inc.

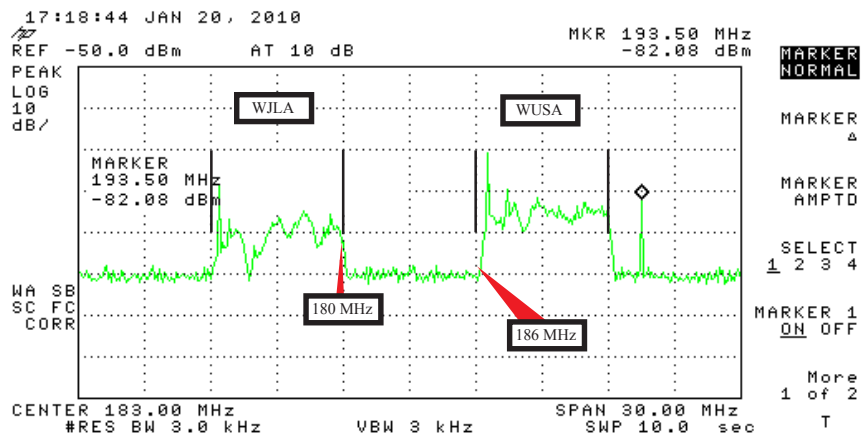
FIGURE 19 SPECTRAL PLOTS - WGAL POINT 3

prepared June 2010 for

Detroit Free Press, Inc.
WUSA(TV) Washington, D.C.
Experimental Authorization
Ch. 9 52 kW 235 m



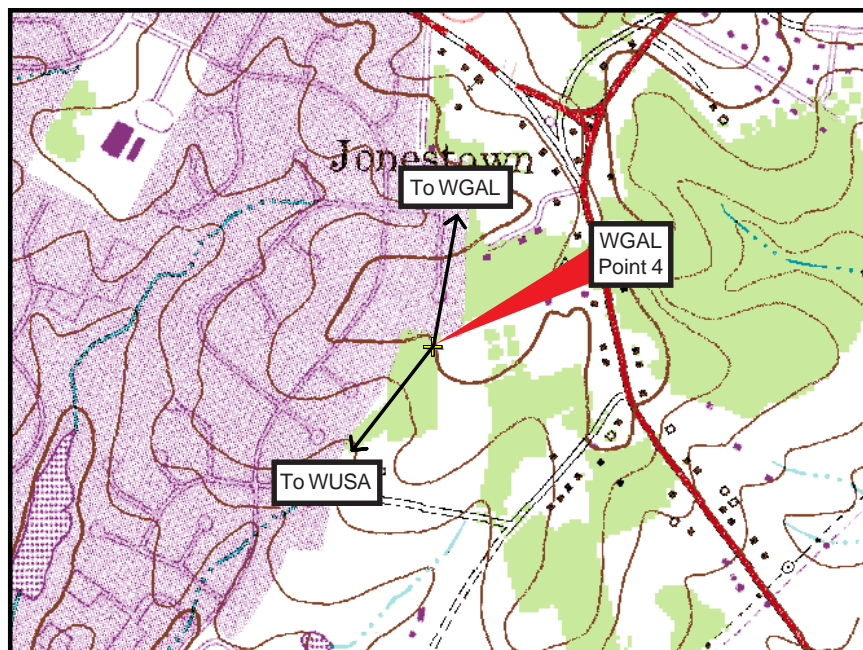
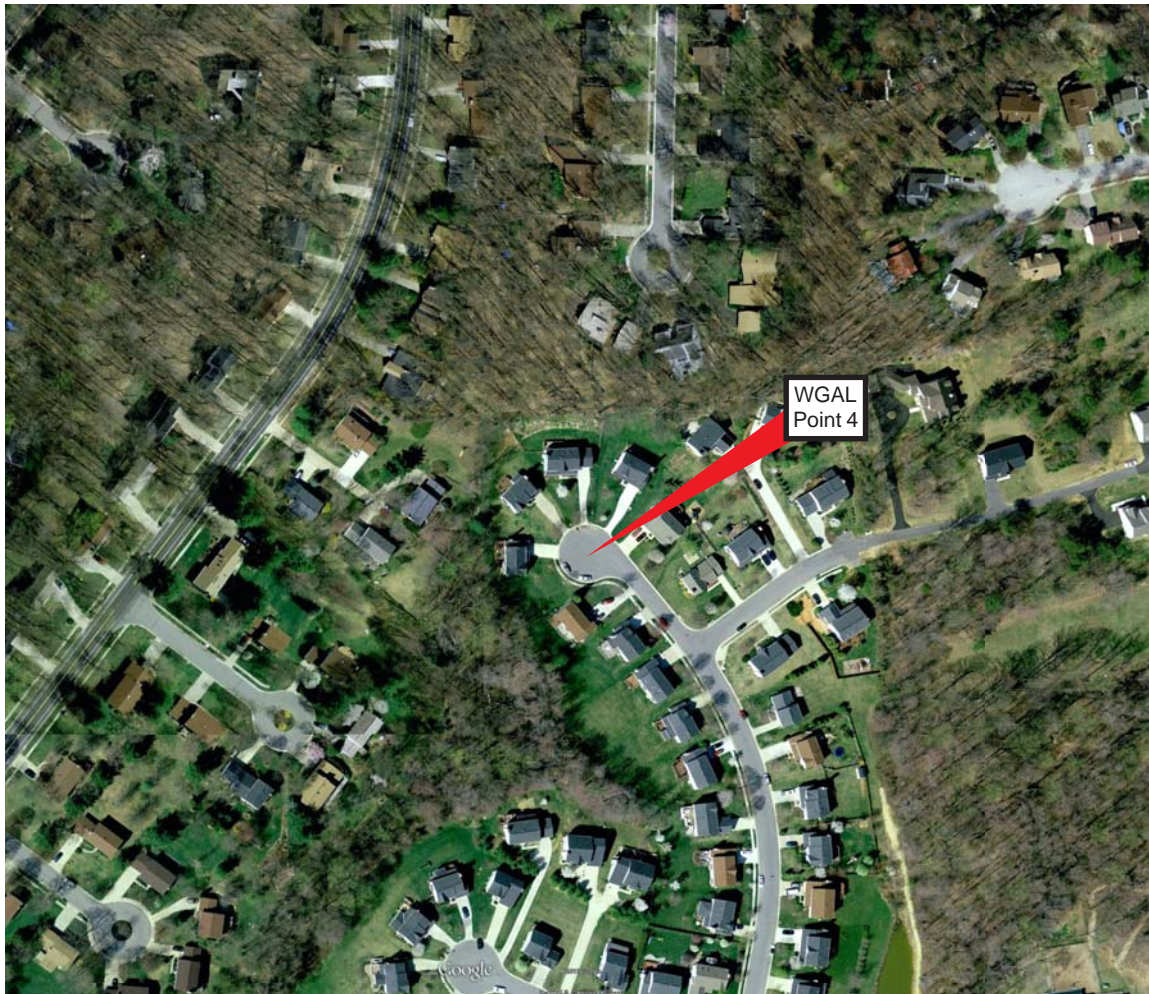
WGAL Point 3 - Plot 1 - High gain antenna oriented towards WGAL



WGAL Point 3 - Plot 2 - High gain antenna oriented towards WUSA operating at 52 kW ERP

FIGURE 20
WGAL MEASUREMENT POINT 4
LOCATION MAP

prepared June 2010 for
Detroit Free Press, Inc.
WUSA(TV) Washington, D.C.
Experimental Authorization
Ch. 9 52 kW 235 m

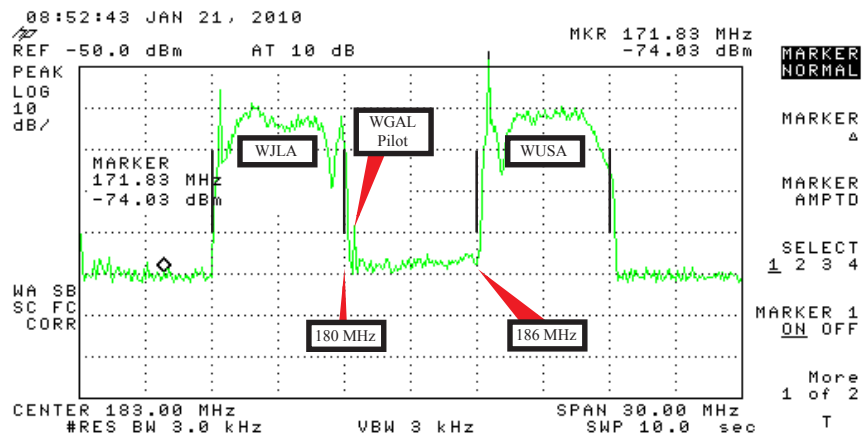


Cavell, Mertz & Associates, Inc.

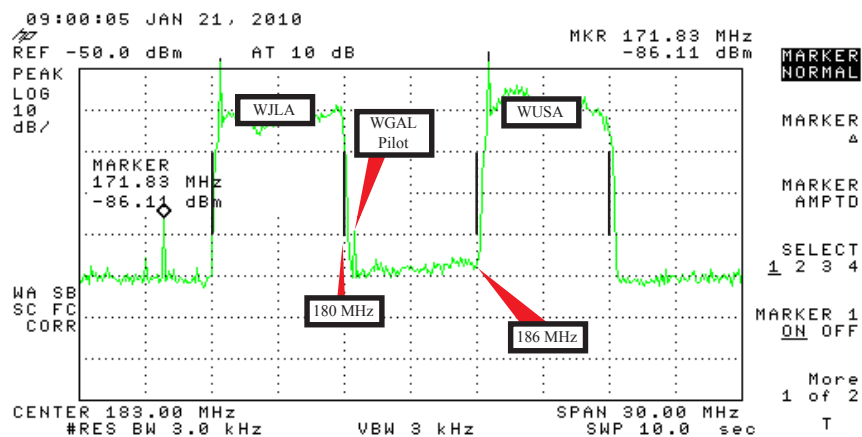
FIGURE 21 SPECTRAL PLOTS - WGAL POINT 4

prepared June 2010 for

Detroit Free Press, Inc.
WUSA(TV) Washington, D.C.
Experimental Authorization
Ch. 9 52 kW 235 m



WGAL Point 4 - Plot 1 - High gain antenna oriented towards WGAL



WGAL Point 4 - Plot 2 - High gain antenna oriented towards WUSA operating at 52 kW ERP

FIGURE 22 WUSA(TV) MEASUREMENT LOCATIONS

prepared June 2010 for

Detroit Free Press, Inc.
WUSA(TV) Washington, D.C.
Experimental Authorization
Ch. 9 52 kW 235 m

Cavell, Mertz & Associates, Inc.
Manassas, Virginia

WUSA(TV)
Experimental Authorization
(BDSTA-20091218ACS)
Ch. 9 52 kW 325 m
Service Contour

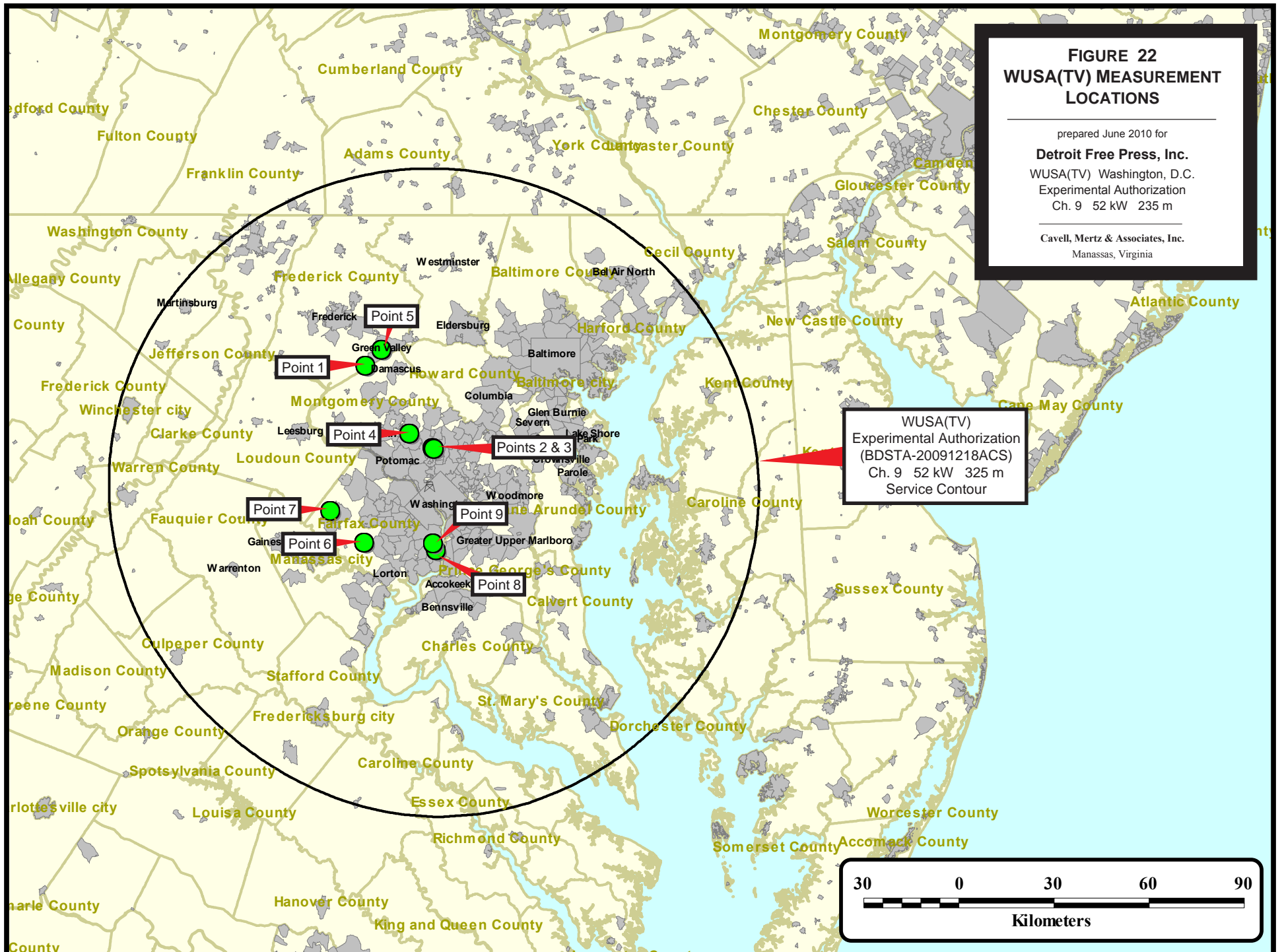


Table III
WUSA-DT RECEPTION TEST RESULTS
 prepared for
Detroit Free Press, Inc.
 WUSA(TV) Washington, D.C.
 Experimental Authorization
 Ch. 9 52 kW 235 m

		<u>Coordinates</u>							
<u>Point No.</u>	<u>Location</u>	<u>Latitude</u>			<u>Longitude</u>			<u>WUSA</u>	<u>WUSA</u>
		<u>(°)</u>	<u>(min)</u>	<u>(sec)</u>	<u>(°)</u>	<u>(min)</u>	<u>(sec)</u>	<u>At 12.6 kW ERP</u>	<u>At 52 kW ERP</u>
1	Ijamsville, MD	39	17	53.1	77	18	45.0	No Signal	No Signal
2	Silver Spring, MD	39	3	52.1	77	4	0.3	SNR 27.8 dB	SNR 28.6 dB
3	Silver Spring, MD	39	3	46.1	77	3	45.8	No Prior Measurement	SNR 28.7 dB
4	Rockville, MD	39	6	22.9	77	9	8.3	No Prior Measurement	SNR 35.2 dB
5	Monrovia, MD	39	20	35.8	77	15	16.6	No Signal	No Signal
6	Fairfax, VA	38	47	47.2	77	19	0.2	No Signal	No Signal
7	Chantilly, VA	38	53	11.2	77	26	28.6	No Signal	No Signal
8	Alexandria, VA	38	46	30.2	77	3	17.6	SNR 27.6 dB	SNR 34.2 dB
9	Alexandria, VA	38	47	38.5	77	3	57.7	SNR 30.6 dB	SNR 34.2 dB