

Engineering Statement

W255DB Bristol, Virginia (Facility ID # 140578)
Licensee - Bristol Broadcasting Company, Inc.
Application to Modify Existing Facilities

By this Application, the Licensee (Bristol Broadcasting Company, Inc. "Bristol") seeks authority to modify the facilities of FM Translator Station W255DB including changing the antenna/transmitter site, antenna height, and effective radiated power.

Engineering Discussion - Rules Compliance

W255DB will rebroadcast station WWTB(AM) at Bristol, Virginia (Facility ID # 6872) as a "fill-in" translator. The service contour of Translator Station W255DB with the proposed facilities will not extend outside a circle with a 25-mile radius centered at the WWTB(AM) transmitter site. See Figure 1 "Primary Station Data/Rules Compliance Showing" attached herewith.

As is also shown on Figure 1, the predicted 60 dBu contour of the proposed facility will overlap the currently licensed W255DB 60 dBu contour as is required for the filing of a "minor change" application.

Applicant proposes to employ a directional antenna for W255DB. A horizontal radiation pattern of the proposed antenna is included herewith as Figure 2.

The W255DB antenna will be side-mounted on an existing tower which is attached atop a municipal utility water tank.

Contour Overlap Analysis

An analysis of contour overlap to co-channel, adjacent channel, and IF channel facilities created by the instant proposal to operate W255DB on channel 255D (98.9 MHz) was completed. This analysis (see Figure 4) demonstrated that there will be no prohibited contour overlap to any present or proposed facilities with only two exception:

The first potential for interference is vis-a-vis WTFM(FM) at Kingsport, Tennessee, operating on the second lower adjacent channel. Second adjacent channel interference is presumed to be caused within a +40 db undesired/desired F(50,10) contour overlap. The WTFM(FM) signal strength at the proposed W255DB tower site was calculated to be 88.1 dBu. Therefore, the W255DB interfering contour would be the 128.1 dbu F(50,10) contour which would extend less than 0.1 kilometer and would reach no population. Therefore, this potential interference area should be waived pursuant to established commission policies.

The second potential for interference is relative to WEXX(FM) at Elizabethton, Tennessee, operating on the second upper adjacent channel. The WEXX(FM) signal strength at the proposed W255DB tower site was calculated to be 69.7 dBu. Accordingly, the W255DB interfering contour relative to WEXX(FM) would be the 109.7 dBu f(50,10) contour which would extend a maximum of less than 0.6 kilometer. Considering the height of the antenna above ground level (18 meters), the additional terrain height at the base of the tower above the surrounding topography, and the antenna vertical-plane beamwidth (63 degrees to half-power);

it is clear that the W255CN interfering contour would not *hit the ground* nor reach any population. Thus, this potential interference area should be waived pursuant to established commission policies.

Based on the foregoing, the instant application is in compliance with all applicable FCC rules regarding interference to other existing or proposed facilities.

Radiofrequency Radiation Exposure and Environmental Considerations

The RF contribution from the proposed 0.240 kW facility with the center of radiation at 18 meters above ground level was evaluated using the Commission's FM Model Program and assuming a "worst case" single bay circularly polarized antenna. The maximum RF contribution of the facility at a height of 2 meters above ground was calculated to be $17.233 \mu\text{W}/\text{cm}^2$ at a horizontal distance of 16.38 meters from the tower base. Only one other AM, FM or TV broadcast antenna, WKOS(FM), is located in close enough proximity to the proposed site to warrant consideration for RF contribution. WKOS(FM) (104.9 MHz) operates with an effective radiated power of 2,750 watts with a radiation center height above ground level of 56 meters utilizing a 3-bay full-wave spaced antenna. The Commission's FM Model Program calculated the maximum rf contribution at ground level from the WKOS(FM) antenna at $9.799 \mu\text{W}/\text{cm}^2$ at a horizontal distance of 25.2 meters. The maximum combined RF exposure from WKOS(FM) and the facilities proposed hereby would be $27.032 \mu\text{W}/\text{cm}^2$. This is well below the maximum permissible of $200 \mu\text{W}/\text{cm}^2$ for general public exposure and the limit of $100 \mu\text{W}/\text{cm}^2$ for "controlled" areas, and, therefore, the proposed facility will be in full compliance with the FCC-specified guidelines for human exposure to radiofrequency radiation in both the "controlled" and "un-controlled" environments.

The proposed W255DB antenna will be side-mounted on an existing tower which is attached atop a municipal utility water tank and will create no significant visual impact to the tank/tower.

The area at the base of the water tank on which the existing tower is mounted is fenced and secured to prevent unauthorized or accidental access to the area. Signs will be posted warning of potential RF danger. Additionally, the licensee in cooperation with other users at the site will reduce operating power or cease transmissions entirely to comply with ANSI guidelines whenever persons require access to the area for maintenance purposes.

In light of the foregoing, it is clear that the proposed facility will have no significant impact on the environment.

Elimination of Concerns About Two Translator Stations Serving Substantially The Same Area While Retransmitting The Signal of The Same Primary Station.

W255DB retransmits AM Station WWTB at Bristol, Virginia. FM Translator Station W287CF (Facility ID # 157963) also retransmits WWTB(AM). However, because the terrain in the vicinity of WWTB (AM) and W287CF is mountainous with many hills and ridges dissecting the WWTB(AM) 2.0 mV/m contour area, it is virtually impossible for a single FM translator station to cover the whole area. Indeed, Translator Station W287CF fails to provide 60 dBu or greater service to a substantial portion of the WWTB(AM) coverage area in and around Kingsport, Tennessee (one of the major cities in the WWTB metro service area) as is shown by a Longley-Rice study included herewith as "Figure 3 - Longley-Rice Analysis of 60 dBu Coverage from W287CF." The population in this area in the vicinity of Kingsport within the 2.0 mV/m contour of WWTB(AM) that does not receive 60 dBu or greater service from W287CF is more

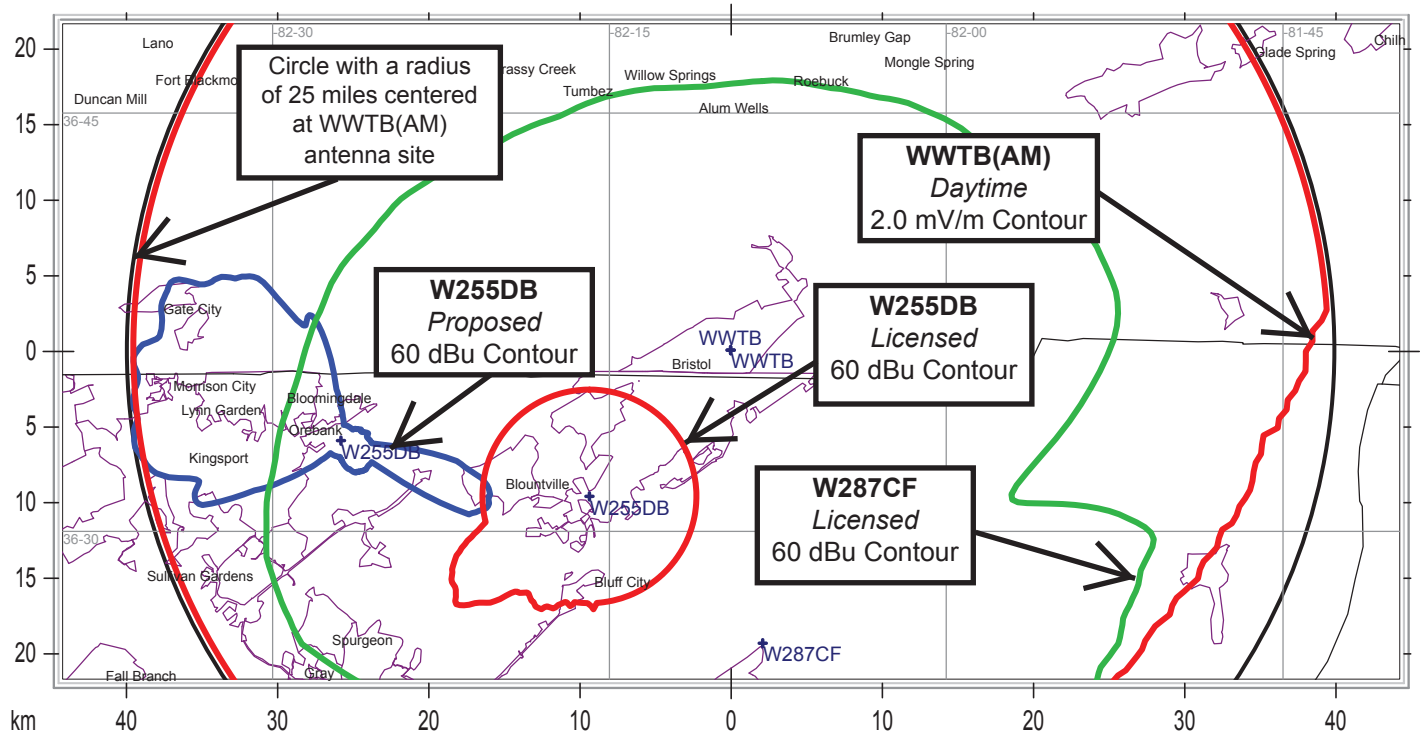
than 35,000 persons. W255DB with the proposed facilities would provide 60 dBu or greater service to these persons. Accordingly, a public interest benefit for W255DB to rebroadcast WWTB(AM) is clearly demonstrated.

Figure 1 also illustrates that with the facilities proposed hereby there would be less than 50 percent overlap of the predicted 60 dBu contours of W255DB and W287CF. Thus, concerns raised in an informal objection (See Pleading File Number: 0000117647) by Triangle Access Broadcasting, Inc., to the license renewal applications of W255DB and W287CF would be eliminated.

Bristol Broadcasting Company, the applicant, also notes that the Commission previously granted a construction permit (See BPFT-20170717AAU) for facilities very similar to those sought by this application. Bristol purchased equipment to build those authorized facilities but experienced difficulty in finding a tower crew to install the antenna in 2019 due to shutdowns and travel restrictions related to the coronavirus pandemic. That construction permit expired in August 2019 before construction could be completed. Because of the earlier equipment purchases and because Bristol now has a tower climber on standby, construction of the proposed facilities can and will be completed expeditiously upon approval by the Commission.

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Figure 1 - Primary Station Data/Rules Compliance Showing



FM Translator Station W255DB rebroadcasts Station WWTB(AM) at Bristol, Virginia. The service contour of W255DB with the proposed facilities will not extend outside a circle with a 25-mile radius centered at the WWTB(AM) transmitter site. WWTB(AM) is co-owned with W255DB by Bristol Broadcasting Company, Inc.

The 60 dBu contour of the proposed W255DB facilities will have overlap with the licensed 60 dBu contour of W255DB as required for a minor change application.

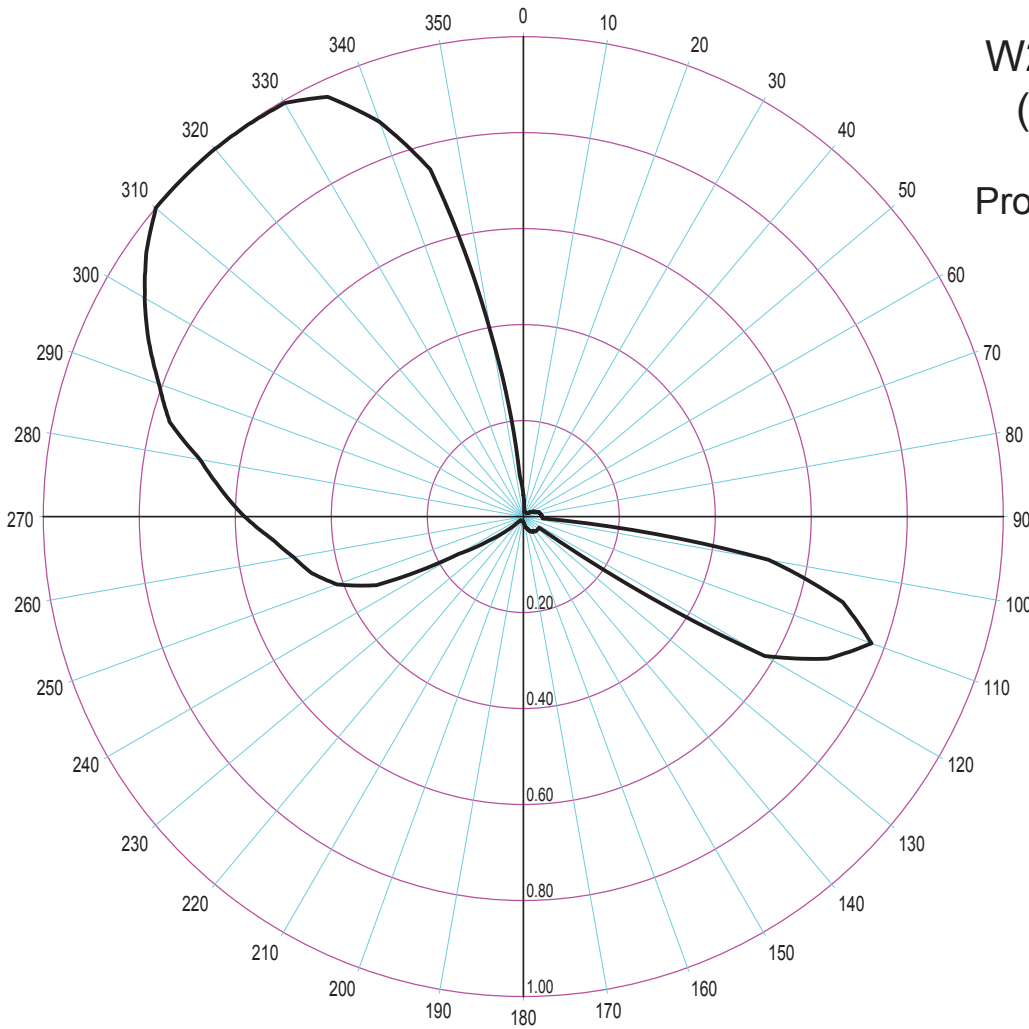
As in shown in the graphic above, less than 50 percent of the proposed W255DB 60dBu contour overlaps with the 60 dBu contour of FM Translator Station W287CF. Both W255DB and W287CF rebroadcast WWTB(AM).

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W255DB Bristol, Virginia
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Figure 2
Proposed Antenna Horizontal
Plane Pattern



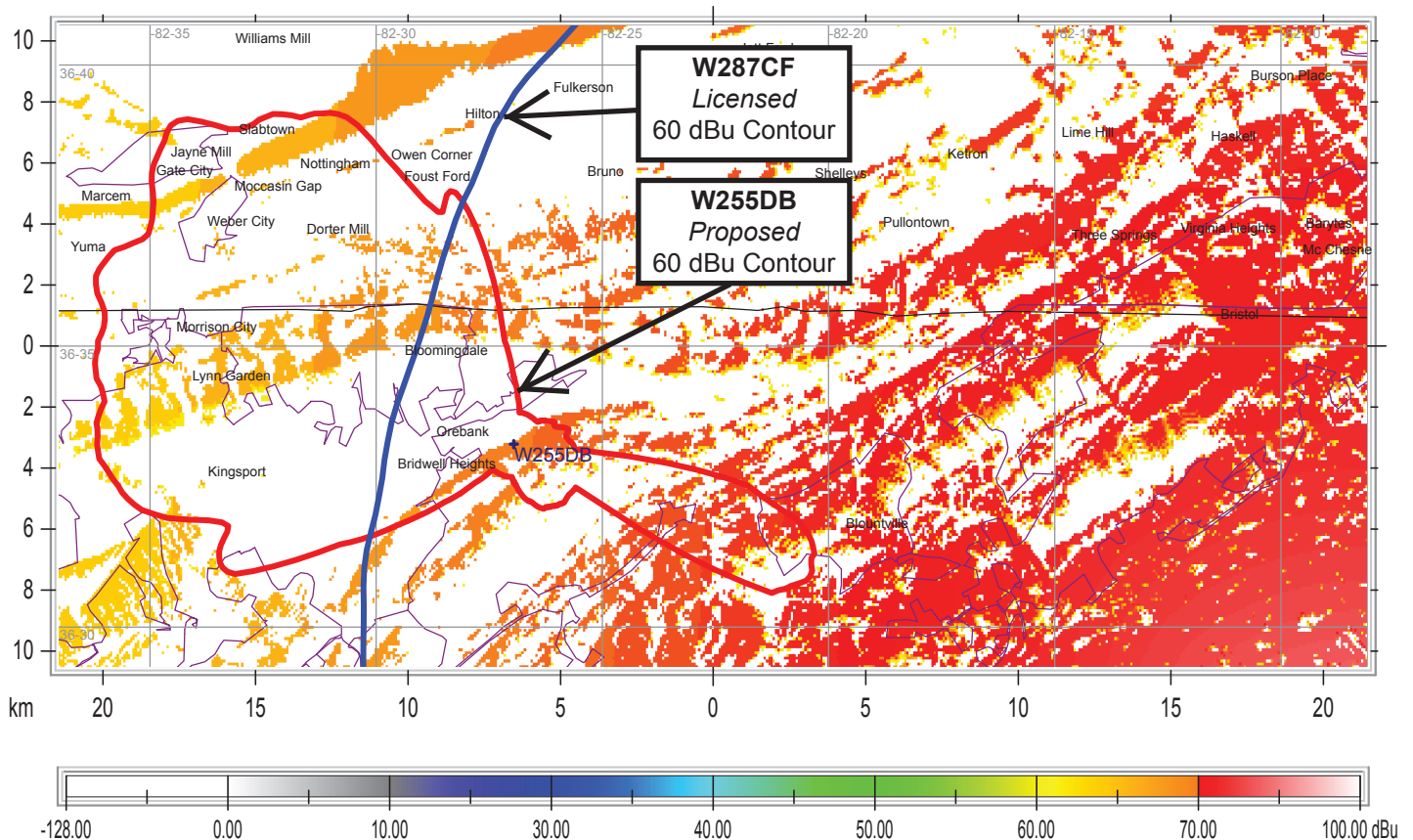
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Azim	Rel.FS	ERP [W]	dBk	Azim	Rel.FS	ERP [W]	dBk	Azim	Rel.FS	ERP [W]	dBk	Azim	Rel.FS	ERP [W]	dBk
0.0	0.045	0.486	-33.132	90.0	0.040	0.384	-34.155	180.0	0.012	0.035	-44.613	270.0	0.581	81.038	-10.913
5.0	0.020	0.096	-40.176	95.0	0.040	0.384	-34.155	185.0	0.010	0.024	-46.197	275.0	0.631	95.586	-10.196
10.0	0.010	0.024	-46.197	100.0	0.519	64.665	-11.893	190.0	0.010	0.024	-46.197	280.0	0.684	112.318	-9.496
15.0	0.010	0.024	-46.197	105.0	0.689	113.966	-9.432	195.0	0.010	0.024	-46.197	285.0	0.763	139.761	-8.546
20.0	0.010	0.024	-46.197	110.0	0.772	143.077	-8.444	200.0	0.010	0.024	-46.197	290.0	0.808	156.732	-8.048
25.0	0.010	0.024	-46.197	115.0	0.700	117.634	-9.295	205.0	0.010	0.024	-46.197	295.0	0.861	177.968	-7.497
30.0	0.010	0.024	-46.197	120.0	0.581	81.038	-10.913	210.0	0.010	0.024	-46.197	300.0	0.911	199.238	-7.006
35.0	0.010	0.024	-46.197	125.0	0.040	0.384	-34.155	215.0	0.010	0.024	-46.197	305.0	0.959	220.787	-6.560
40.0	0.010	0.024	-46.197	130.0	0.040	0.384	-34.155	220.0	0.010	0.024	-46.197	310.0	1.000	240.069	-6.197
45.0	0.010	0.024	-46.197	135.0	0.040	0.384	-34.155	225.0	0.020	0.096	-40.176	315.0	1.000	240.069	-6.197
50.0	0.012	0.035	-44.613	140.0	0.040	0.384	-34.155	230.0	0.045	0.486	-33.132	320.0	1.000	240.069	-6.197
55.0	0.015	0.054	-42.675	145.0	0.038	0.347	-34.601	235.0	0.085	1.734	-27.608	325.0	0.998	239.109	-6.214
60.0	0.020	0.096	-40.176	150.0	0.036	0.311	-35.071	240.0	0.155	5.768	-22.390	330.0	0.995	237.674	-6.240
65.0	0.025	0.150	-38.238	155.0	0.034	0.278	-35.567	245.0	0.338	27.426	-15.618	335.0	0.965	223.558	-6.506
70.0	0.029	0.202	-36.949	160.0	0.029	0.202	-36.949	250.0	0.413	40.948	-13.878	340.0	0.875	183.803	-7.356
75.0	0.034	0.278	-35.567	165.0	0.025	0.150	-38.238	255.0	0.456	49.919	-13.017	345.0	0.749	134.679	-8.707
80.0	0.036	0.311	-35.071	170.0	0.020	0.096	-40.176	260.0	0.486	56.703	-12.464	350.0	0.386	35.769	-14.465
85.0	0.038	0.347	-34.601	175.0	0.015	0.054	-42.675	265.0	0.527	66.674	-11.760	355.0	0.085	1.734	-27.608

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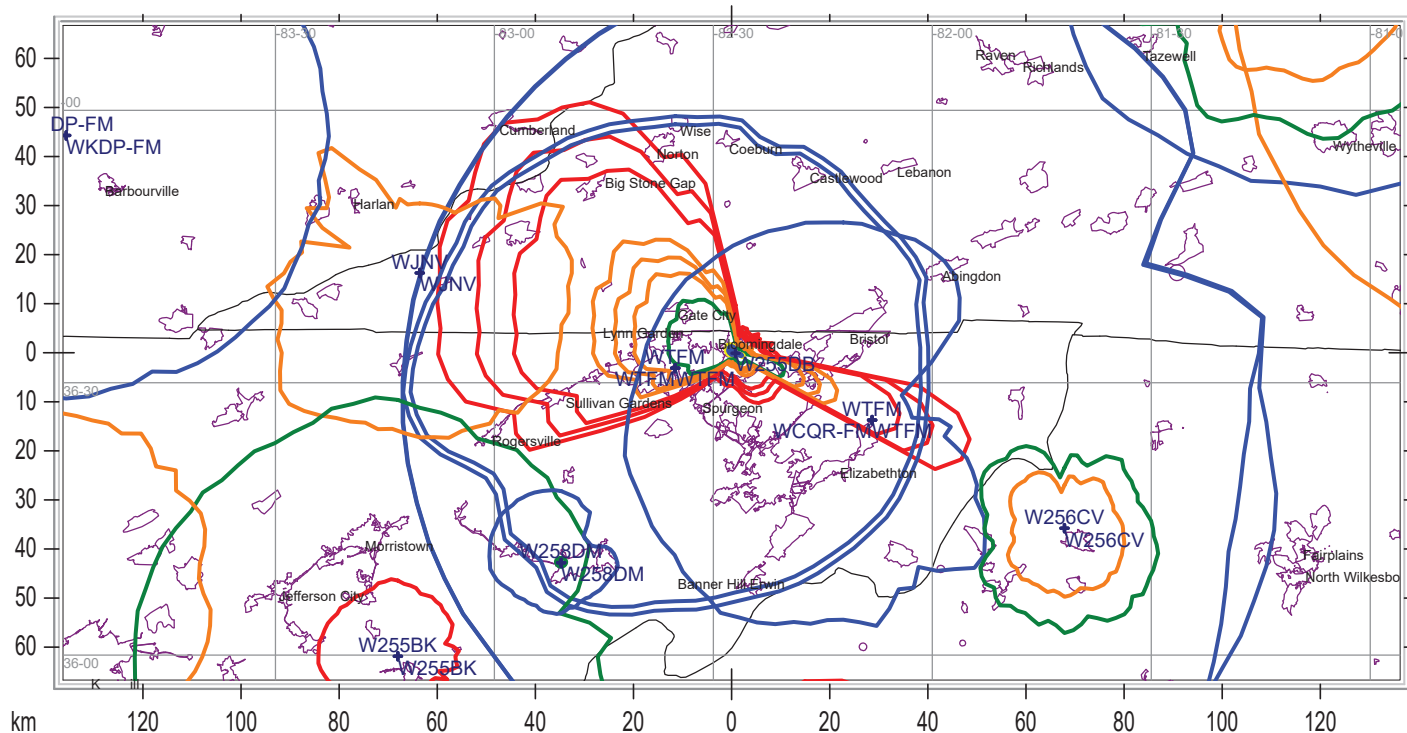
Figure 3 - Longley-Rice Analysis of 60 dBu Coverage from W287CF



The field intensity produced by Translator Station W287CF was calculated using the Longley-Rice methodology, and the resulting field intensities greater than 60 dBu were plotted on the chart above. This plotting illustrates that less than 30 percent of the area covered by the 60 dBu contour of the proposed W255DB facilities would also receive 60 dBu or greater service from Translator Station W287CF. W255DB would provide service to a significant geographical area and a significant population not provided 60 dBu service by W287CF. Accordingly, a public interest benefit for W255DB to rebroadcast WWTB(AM) is demonstrated.

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Figure 4 - Channel 255D Usability Study



Callsign	City	State	Freq	Channel	ERP Watts	Class	Status	Distance Kilometer	Separation	Clr
WTFM	KINGSPORT	TN	98.5	253	74000	C	LIC	31.08	0	-28.85 dB
WEXX	ELIZABETHTON	TN	99.3	257	4400	C3	LIC	27.78	0	-10.28 dB
WJNV	JONESVILLE	VA	99.1	256	4000	A	LIC	66.54	0	7.31 dB
W255BK	NEWPORT	TN	98.9	255	500	D	LIC	92.8	0	10.63 dB
WCQR-FM	KINGSPORT	TN	88.3	202	1200	C2	LIC	31.07	15	16.1
WSIP-FM	PAINTSVILLE	KY	98.9	255	100000	C1	LIC	147.95	0	16.25 dB
WSPA-FM	SPARTANBURG	SC	98.9	255	100000	C	LIC	154.27	0	18.13 dB
W256CV	BOONE	NC	99.1	256	16	D	LIC	76.24	0	20.99 dB
WSPA-FM	SPARTANBURG	SC	98.9	255	50000	C	LIC	154.27	0	21.53 dB
WSLQ	ROANOKE	VA	99.1	256	200000	C	LIC	216.83	0	29.17 dB