

Comprehensive Engineering Exhibit
BNPFT20030317APJ Harrisonburg, VA
Facility ID No. 148178

This exhibit is for a modification for BNPFT20030317APJ, facility ID 148178 which is seeking a change in antenna location, increase in antenna height, and change in antenna type.

It is proposed to locate the transmit antenna 13 meters above ground on an unregistered tower on Massanutten Peak, southwest of Massanutten VA. The proposed antenna is a Scala CL-FMV with an ERP of 0.250KW in the major lobe, oriented at 310 degrees true north.

Below as Figure 1 is a spacing study from which it can be determined that this proposal is within the protected contour of translator application BNPFT20030310ACG, facility ID# 141360, which is on a second adjacent channel. With respect to all other authorized facilities this proposal will not create any prohibited contour overlap.

Section 74.1204(d) states that *"The provisions of this section concerning prohibited overlap will not apply where the area of such overlap lies entirely over water. In addition, an application otherwise precluded by this section will be accepted if it can be demonstrated that no actual interference will occur due to intervening terrain, lack of population or such other factors as may be applicable."*

We will demonstrate that a lack of population and/or other factors allow this proposal to be compliant with 74.1204. The process commonly called "Living Way", as recently described in FCC 08-242 in connection with BPFT-19981001TA, allows for the use of U/D Analysis, also known as "signal strength ratio methodology." In this instant case the facilities of application BNPFT20030310ACG are on a second adjacent channel to this proposal which is to be afforded protection from signals 40 dB stronger.

Figure 2 is a map showing the predicted signal contour of BNPFT20030310ACG at the proposed translator location utilizing the FCC F(50,50) curve. BNPFT20030310ACG is predicted to present a 65.30 dBu signal at the translator tower location. Thus the 105.3 dBu contour (65.30 dBu + 40 dBu) of this proposal is the lowest value predicted to cause interference to BNPFT20030310ACG. Also Shown in Figure 2 are the F(50,50) contours of the primary station, this proposal, and that of the original application.

Figure 3 shows the proposed directional antenna pattern where it can be seen that for azimuths between 35 and 225 degrees (clockwise) the power radiated from the antenna is .09%, or 0.225W.

Figure 4 depicts the predicted signal strength from the translator both at ground level, and at receiving antenna locations up to 6 meters above ground level of the translator for 0.225W ERP for azimuths between 35 and 225 degrees (clockwise). The 6 meter data is identified in the table as the "artificial plane," and as can be determined by the columns colored green, at no location from ground level to 6 meters above ground does the predicted signal of the proposed translator exceed that of 40 dB greater than BNPFT20030310ACG.

Figure 5 is an aerial image of the transmitter site and surrounding area. The area immediately surrounding the tower is not occupied and contains only unmanned communications shelters. For areas between 35 and 225 degrees clockwise, there is no inhabited space exceeding 6M (20') above ground

level. For azimuths between 225 and 35 degrees (clockwise) the interfering contour of 105.30dBu is predicted to extend 603 meters from the antenna, using straight line methodology. As can be seen in the image, there are no inhabited areas between the azimuths of 225 and 35 degrees (clockwise) closer than 603 meters. Thus, compliance with Section 74.1204(d) has been demonstrated.

RF Radiation Compliance

The proposed facilities were evaluated in terms of potential radio frequency radiation exposure at ground level in accordance with OET Bulletin No. 65, "Evaluating Compliance With FCC-Specified Guidelines for Human Exposure to Radio Frequency Radiation."

The proposed antenna system is not modeled in "FM Model". A worst case EPA type 1 "Ring-Stub", 1 bay antenna full wave element spaced, has been evaluated as being mounted with its center of radiation 13 meters above ground level, with an effective radiated power of 0.250 kilowatts in the vertical plane. At 2 meters above the surface, at 2.4 meters from the closest point of approach, this proposal will contribute worst case, 65.8 microwatts per square centimeter, or 6.58 percent of the allowable ANSI limit for controlled exposure, and 32.9 percent of the allowable limit for uncontrolled exposure.

The tower also holds the WACL FM antenna, an EPA type 3 "Rototiller", 2 bay full wave spaced, which was also evaluated using "FM Model" as being mounted with its center of radiation 18 meters above ground level, with an effective radiated power of 0.90 kilowatts in the vertical and horizontal planes. At 2 meters above the surface, at 10.8 meters from the closest point of approach, this proposal will contribute worst case, 33.7 microwatts per square centimeter, or 3.37 percent of the allowable ANSI limit for controlled exposure, and 16.9 percent of the allowable limit for uncontrolled exposure.

Adding the exposure from each antenna, the worst case combined Occupational/Controlled exposure is 9.95% of the allowable limit, and the worst case General Population/Uncontrolled exposure is 49.7% of the allowable limit. It is therefore believed that this proposal is in compliance with OET Bulletin Number 65 as required by the Federal Communications Commission.

Further, the tower is surrounded by a fence with a locked gate with appropriate warning signs and the applicant will see that signs remain posted in the vicinity of the tower, warning of potential radio frequency hazards at the site. The applicant will cooperate with other users of the tower to reduce power of the facility, or discontinue operation, as necessary to limit human exposure to levels less than specified by the Federal Communications Commission should anyone be required to climb the tower for maintenance or inspection

Figure 1. Spacing Study

Comstudy 2.2 Search of Channel 300 (107.9 MHz Class D) at 38-23-36.0 N, 78-46-14.0 W									
Callsign	State	City	Freq	Channel	ERP_w	Class	Status	Distance_km	Clr
NEW	VA	HARRISONBURG	107.9	300	250	D	APP	9.58	-53.19 dB
NEW	VA	HARRISONBURG	107.5	298	10	D	APP	6.44	-7.88 dB
WYYD	VA	AMHERST	107.9	300	19000	C1	LIC	115.23	1.54 dB
WWWT-FM	VA	MANASSAS	107.7	299	29000	B	LIC	90.2	3.49 dB
WWWT-FM	VA	MANASSAS	107.7	299	20000	B	LIC	90.2	6.40 dB
WYYD	VA	AMHERST	107.9	300	4000	C1	LIC	99.53	8.87 dB
W300BU	WV	KEYSER	107.9	300	50	D	LIC	117.44	12.28 dB
WCHV-FM	VA	CHARLOTTESVILLE	107.5	298	210	A	LIC	52	16.32 dB
WYYD-FM1	VA	ROANOKE	107.9	300	2500	D	LIC	163.18	17.76 dB
WDSY-FM	PA	PITTSBURGH	107.9	300	17500	B	LIC	253.73	21.09 dB
WDSY-FM	PA	PITTSBURGH	107.9	300	29000	B	LIC	253.73	21.28 dB
WDSY-FM	PA	PITTSBURGH	107.9	300	36000	B	LIC	253.73	21.99 dB
WFSP-FM	WV	KINGWOOD	107.7	299	1600	A	LIC	146.08	24.91 dB
NEW	WV	LEWISBURG	107.9	300	110	D	APP	166.69	26.70 dB
WDTF-LP	WV	BERKELEY SPRINGS	107.9	300	100	LP100	LIC	144.06	28.58 dB
WRQX	DC	WASHINGTON	107.3	297	19500	B	LIC	159.61	30.87 dB
WFSP-FM	WV	KINGWOOD	107.7	299	0	A	USE	143.51	30.91 dB
WLZL	MD	ANNAPOLIS	107.9	300	50000	B	LIC	195.66	31.32 dB
WYYD	VA	AMHERST	107.9	300	0	C1	USE	115.41	31.45 dB
WEMM-FM	WV	HUNTINGTON	107.9	300	50000	B	LIC	304.43	31.55 dB
WLZL	MD	ANNAPOLIS	107.9	300	49000	B	CP	195.65	31.30 dB
WRQX	DC	WASHINGTON	107.3	297	21500	B	LIC	159.61	31.92 dB
WDSY-FM	PA	PITTSBURGH	107.9	300	0	B	USE	253.73	32.73 dB
WLZL	MD	ANNAPOLIS	107.9	300	28000	B	LIC	195.65	33.03 dB
WVRW	WV	GLENVILLE	107.7	299	1700	A	LIC	188.17	34.49 dB
W300AQ	WV	WILLIAMSTOWN	107.9	300	50	D	LIC	255.94	36.96 dB
WGTY	PA	GETTYSBURG	107.7	299	16000	B	LIC	226.25	37.47 dB
870430ME	VA	CHARLOTTESVILLE	107.5	298	0	A	USE	46.89	37.74 dB

Figure 2. Contour Map

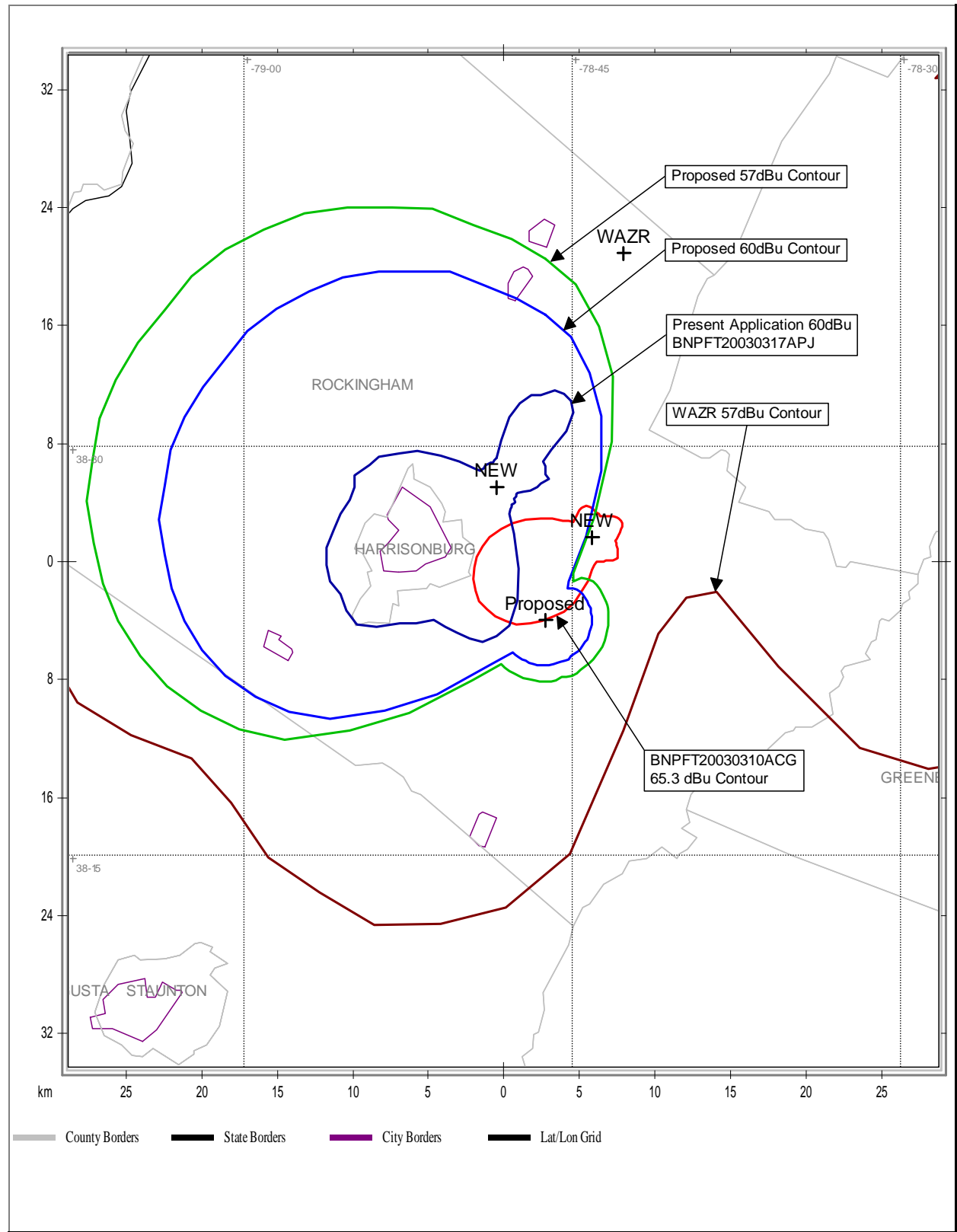


Figure 3. Antenna Pattern

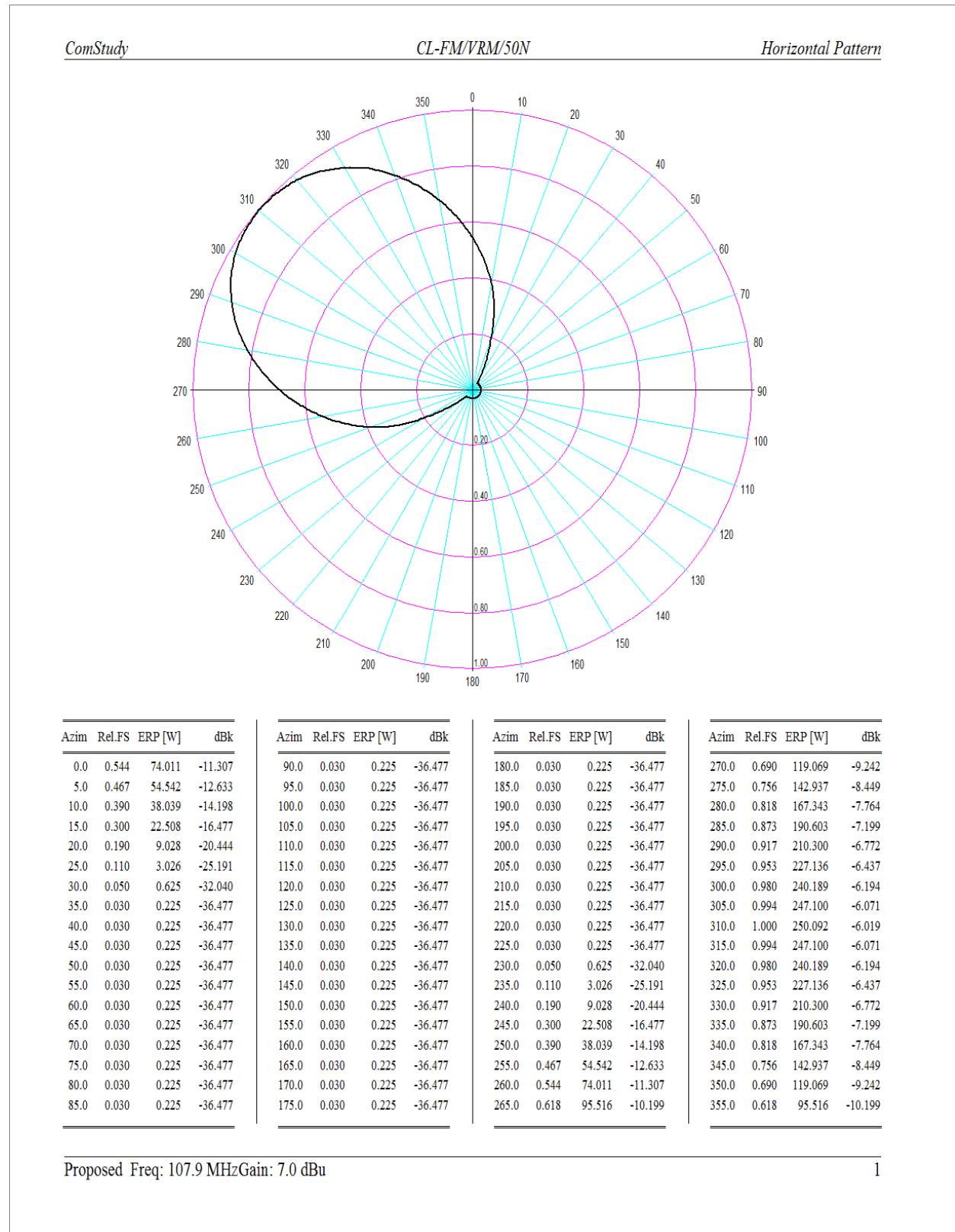


Figure 4. Distance to Interference Contour With Antenna Vertical Pattern 35 to 225 Degrees

Proposed Antenna:		Scala CL-FM V Pol							
Proposed Power:		0.000225	kW						
Antenna Height AGL:		13	meters						
Interference Contour:		105.3	dBu f(50:10)						
Artificial Rcv Antenna Height:		6	meters						
Distance (Free Space)									
Equation:		=(10^(((106.92-[desired dBu]+[ERP in dBk])/20))*1000							
Field Strength (dBu) Equation		"=106.92-(20*(LOG10[DistMeters]/1000)))+[ERP in dBk]							

Depression				Distance				
Angle	Antenna			from Ant.	Distance	Field Strength	Distance	Field Strength
Below	Relative	ERP	ERP	to Interf	from Ant. to	in dBu @	from Ant.	in dBu @
Horizon	Field	in kW	in dBk	Contour	Artificial Plane	Artificial Plane	to Ground Level	Ground Level
0°	1.000	0.000	-36.48	18.08 m	infinite	---	infinite	---
-5°	0.980	0.000	-36.65	17.71 m	80.32 m	92.17 dBu	149.16 m	86.79 dBu
-10°	0.950	0.000	-36.92	17.17 m	40.31 m	97.89 dBu	74.86 m	92.51 dBu
-15°	0.895	0.000	-37.44	16.18 m	27.05 m	100.84 dBu	50.23 m	95.46 dBu
-20°	0.820	0.000	-38.20	14.82 m	20.47 m	102.50 dBu	38.01 m	97.12 dBu
-25°	0.735	0.000	-39.15	13.29 m	16.56 m	103.38 dBu	30.76 m	98.01 dBu
-30°	0.645	0.000	-40.29	11.66 m	14.00 m	103.71 dBu	26.00 m	98.33 dBu
-35°	0.562	0.000	-41.48	10.16 m	12.20 m	103.71 dBu	22.66 m	98.33 dBu
-40°	0.470	0.000	-43.04	8.50 m	10.89 m	103.14 dBu	20.22 m	97.77 dBu
-45°	0.360	0.000	-45.35	6.51 m	9.90 m	101.66 dBu	18.38 m	96.28 dBu
-50°	0.250	0.000	-48.52	4.52 m	9.14 m	99.18 dBu	16.97 m	93.81 dBu
-55°	0.155	0.000	-52.67	2.80 m	8.55 m	95.61 dBu	15.87 m	90.24 dBu
-60°	0.085	0.000	-57.89	1.54 m	8.08 m	90.88 dBu	15.01 m	85.50 dBu
-65°	0.045	0.000	-63.41	0.81 m	7.72 m	85.75 dBu	14.34 m	80.37 dBu
-70°	0.020	0.000	-70.46	0.36 m	7.45 m	79.02 dBu	13.83 m	73.64 dBu
-75°	0.010	0.000	-76.48	0.18 m	7.25 m	73.24 dBu	13.46 m	67.86 dBu
-80°	0.010	0.000	-76.48	0.18 m	7.11 m	73.41 dBu	13.20 m	68.03 dBu
-85°	0.010	0.000	-76.48	0.18 m	7.03 m	73.51 dBu	13.05 m	68.13 dBu
-90°	0.010	0.000	-76.48	0.18 m	7.00 m	73.54 dBu	13.00 m	68.16 dBu

Figure 5. Map showing Azimuths and Unoccupied Area

