

ENGINEERING EXHIBIT

Incentive Auction Channel Reassignment

Application for Digital Television Station Auxiliary Antenna Construction Permit

prepared for

Gray Television Licensee, LLC

WSAZ-TV Huntington, WV

Facility ID 36912

Ch. 22 601 kW 332 m

Gray Television Licensee, LLC (“Gray”) is the licensee of digital television station WSAZ-TV, Facility ID 36912, Huntington WV. Reassignment of WSAZ-TV from Channel 23 to Channel 22 was specified in the *Incentive Auction Closing and Channel Reassignment Public Notice* (DA 17-317, released April 13, 2017). The WSAZ-TV reassignment facility was recently constructed, and WSAZ-TV is now licensed (file# 0000100249) to operate on Channel 22 at 800 kW effective radiated power (“ERP”) with a nondirectional antenna at 386 meters height above average terrain (“HAAT”). *Gray* herein seeks authorization for an auxiliary antenna for WSAZ-TV on its post-auction Channel 22.

The proposed auxiliary antenna is side-mounted on the same tower structure as the licensed main antenna, and will operate on Channel 22 at 601 kW ERP (directional) and an antenna HAAT of 332 meters. The subject antenna was previously authorized for use as an interim facility on WSAZ-TV’s pre-auction Channel 23 (see STA file# 0000079795).

The WSAZ-TV tower structure is associated with FCC Antenna Structure Registration number 1035121. No change to the overall structure height will result from this proposal.

The proposed antenna is a horizontally polarized directional RFS model SBB-24C170. The directional antenna’s azimuthal and elevation patterns are depicted in Figures 1 and 2, respectively.

Figure 3 shows that the 41 dBμ noise limited service contour of the proposed auxiliary facility does not extend beyond that of the authorized main facility. Thus, the proposal complies with §73.1675(a).

Human Exposure to Radiofrequency Electromagnetic Field (Environmental)

The proposed operation was evaluated for human exposure to RF energy using the procedures outlined in the FCC's OET Bulletin Number 65. Based on OET-65 equation (10), and considering the antenna relative field in downward elevations (Figure 2), the graph in Figure 4 depicts calculated power density levels attributable to the proposed facility at locations near the site at a height of two meters above ground level. The maximum calculated RF electromagnetic field attributable to the proposed facility is 4.7 percent of the general population / uncontrolled MPE limit at any location two meters above ground level. This is below the five percent threshold limit described in §1.1307(b) regarding sites with multiple emitters, categorically excluding the applicant from responsibility for taking any corrective action in the areas where the proposal's contribution is less than five percent.

The general public will not be exposed to RF levels attributable to the proposal in excess of the FCC's guidelines. RF exposure warning signs will continue to be posted. With respect to worker safety, the applicant will coordinate exposure procedures with all pertinent stations and will reduce power or cease operation as necessary to protect persons having access to the site, tower, or antenna from RF electromagnetic field exposure in excess of FCC guidelines. This exhibit is limited to the evaluation of exposure to RF electromagnetic field.

List of Attachments

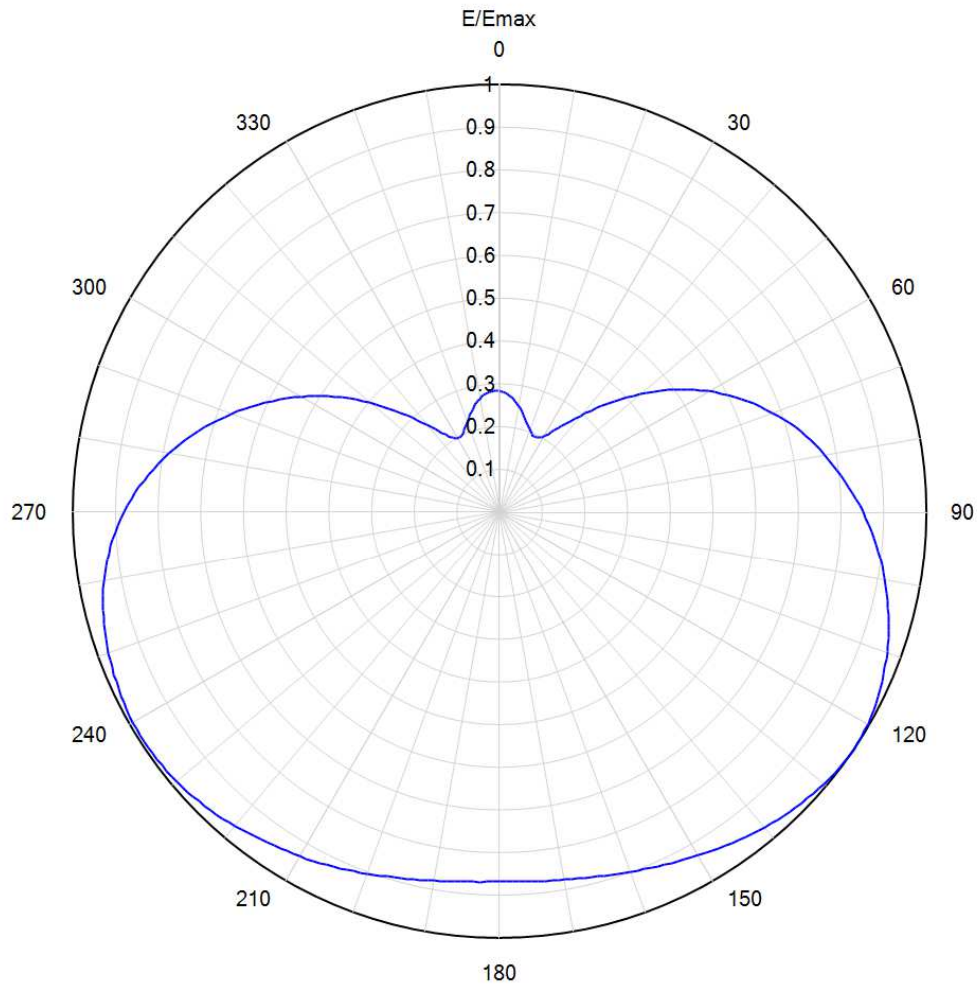
Figure 1	Antenna Azimuthal Pattern
Figure 2, 2A	Antenna Elevation Pattern
Figure 3	Proposed Auxiliary Contours
Figure 4	Calculated RF Electromagnetic Field

Chesapeake RF Consultants, LLC

Joseph M. Davis, P.E.	June 17, 2020	
207 Old Dominion Road	Yorktown, VA 23692	703-650-9600



Azimuth Pattern



Model: SBB-24C170
Location:
Customer:
Date: June 12, 2020
Rotation Angle: 180 degrees

Polarization: Horizontal
Frequency: 521.00 MHz
Directivity: 1.8 (2.51 dB)
Elevation Angle: 1.00 degrees
Horizontal Unit Pattern:
File = SBB-C170-509.pat

Note: Pattern Tolerance +/-5% of Emax

Figure 1

Auxiliary Antenna Azimuthal Pattern
WSAZ-TV Huntington, WV
Facility ID 36912
Ch. 22 601 kW 332 m

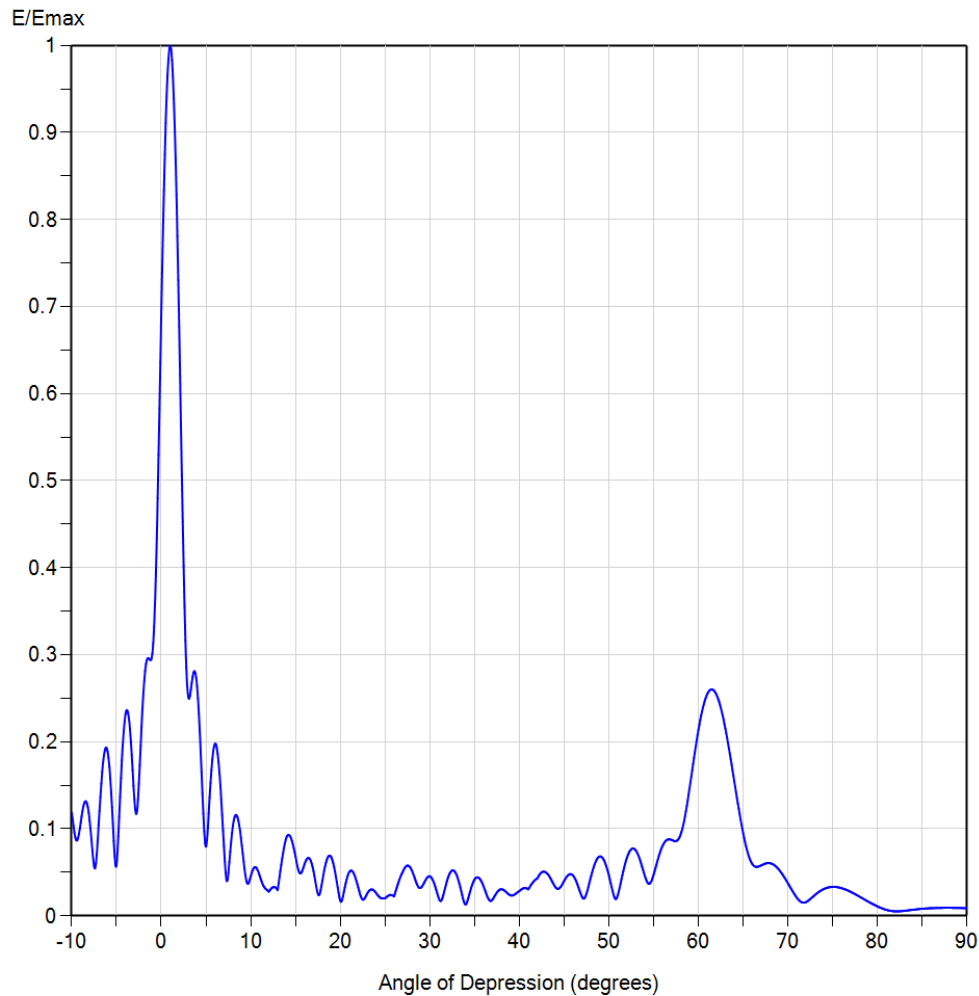
prepared for
Gray Television Licensee, LLC

June, 2020





Elevation Pattern



Model: SBB-24C170
Polarization: Horizontal
Location: Huntington, WV.
Customer: Gray Television WSAZ-DT
Date: April 3, 2018

Frequency: 521.00 MHz
Directivity (Main Lobe): 23.8 (13.77 dBd)
Directivity (At Horizon): 11.3 (10.53 dBd)
Beam Tilt: 1.00 degrees
Azimuth Angle: 304 degrees



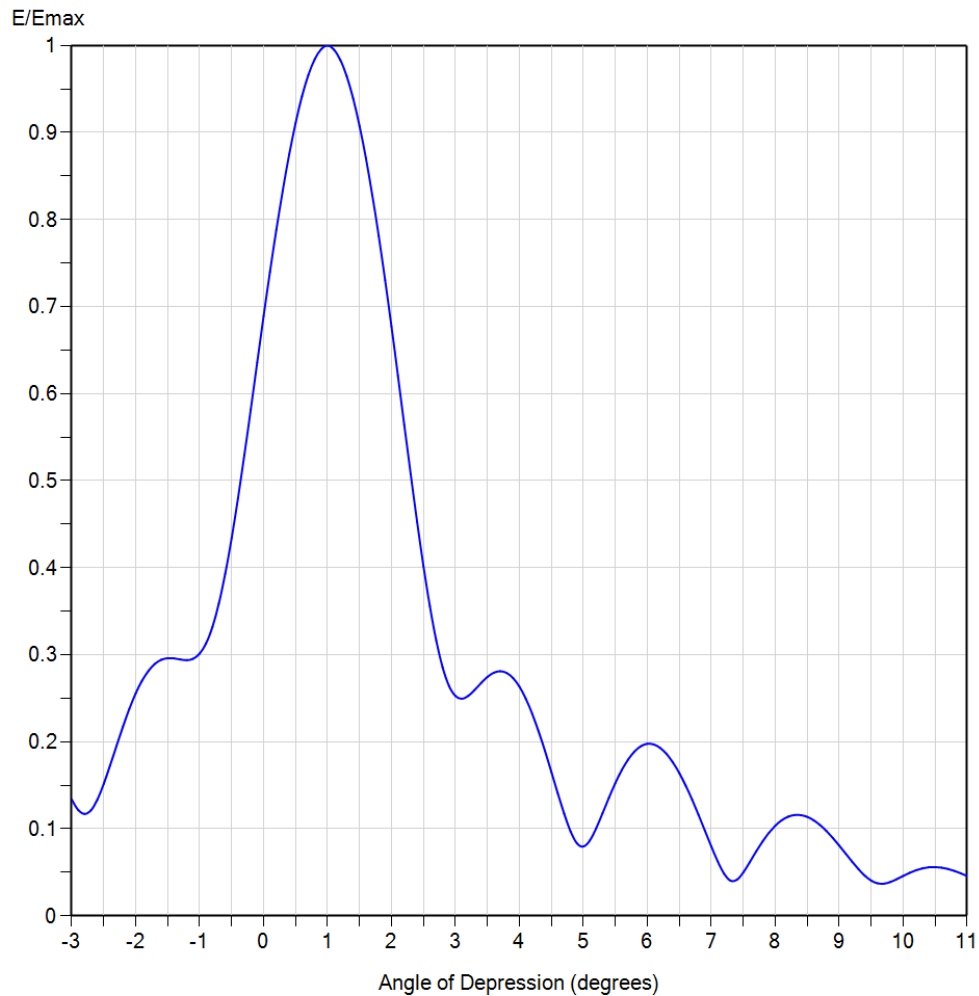
Figure 2
Auxiliary Antenna Elevation Pattern
WSAZ-TV Huntington, WV
Facility ID 36912
Ch. 22 601 kW 332 m

prepared for
Gray Television Licensee, LLC

June, 2020



Elevation Pattern



Model: SBB-24C170
Polarization: Horizontal
Location: Huntington, WV.
Customer: Gray Television WSAZ-DT
Date: April 3, 2018

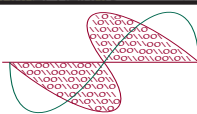
Frequency: 521.00 MHz
Directivity (Main Lobe): 23.8 (13.77 dBd)
Directivity (At Horizon): 11.3 (10.53 dBd)
Beam Tilt: 1.00 degrees
Azimuth Angle: 304 degrees



**Figure 2A - Detail
Auxiliary Antenna Elevation Pattern
WSAZ-TV Huntington, WV
Facility ID 36912
Ch. 22 601 kW 332 m**

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Chesapeake RF Consultants, LLC
Radiofrequency Consulting Engineers
Digital Television and Radio

Figure 3
Proposed Auxiliary Contours
WSAZ-TV Huntington, WV
Facility ID 36912
Ch. 22 601 kW 332 m

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Proposed Auxiliary Ch. 22
601 kW 332 m directional
48 dBu
(Principal Community)
41 dBu
(Noise Limited Service Contour)

Licensed Ch. 22
LMS File# 0000100249
800 kW 386 m nondirectional
41 dBu Contour

Huntington, WV

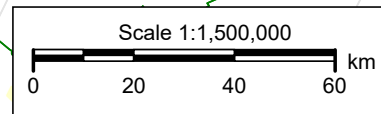


Figure 4
Calculated RF Electromagnetic Field
Auxiliary Antenna
WSAZ-TV Huntington, WV
Facility ID 36912
Ch. 22 601 kW 332 m

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