

# Hope Christian Church of Marlton, Inc.

Exhibit 12-1 - Compliance with CFR 47 §74.1204  
W260BM, Channel 260, 99.9 MHz, M16, Annapolis, MD

## Interference Analysis Overlap Requirements

According to CFR 47 §74.1204(a), translators are required to protect all existing FM stations from interference due to overlap of the protected contours of the existing stations with the interfering contours of the new translators.

Two stations have been identified with outgoing 2<sup>nd</sup> or 3<sup>rd</sup> adjacent contour overlaps from the proposed translator and are listed below. According to CFR 47 §74.1204(d),

**“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 ... lack of population ... .”**

The F(50,50) signals from these stations at the proposed site have been computed based upon the ERP and HAAT in the direction towards the proposed translator, as well as the distance, and have been found to be as follows:

| Station | Power | ERP   | HAAT  | Distance | Protected<br>F(50,50) | Allowable<br>Interfering<br>F(50,10) |
|---------|-------|-------|-------|----------|-----------------------|--------------------------------------|
| WBIG-FM | 50 kW | 50 kW | 149 m | 59.8 km  | 57.8 dBu              | 97.8 dBu                             |
| WIHT    | 22 kW | 22 kW | 229 m | 50.6 km  | 61.9 dBu              | 101.9 dBu                            |

A 40 dB ratio of undesired to desired signal strength gives an allowable interfering F(50,10) field strength of up to 97.8 dBu, based upon the worst case (lowest) of these signal strengths. An ERI Series 100 2-bay ½-wave spaced antenna has been employed to reduce the signal strength that is radiated from all angles other than horizontal. Pages 2 and 3 of this waiver request consist of a spreadsheet based on the free-space equations that demonstrates that the maximum signal strength to reach the ground is 96.9 dBu. It also shows that the allowable interfering 97.8 dBu contour never comes any closer to the ground than 11.2 meters.

An analysis of a USGS 7.5' topographical map shows only residential 2-story dwellings in the area, which are not of sufficient height to reach up and intersect these interfering contours. Hence CFR 47 §74.1204(d) applies, and the predicted area of interference is acceptable to the Commission.

# Hope Christian Church of Marlton, Inc. - Exhibit 12-2

# M16 Annapolis

*Freespace Interference Study based on Vertical Radiation Pattern*

*ERI Series 100 2-bay 1/2-wave spaced antenna*

| Depression<br>Angle from<br>Antenna | Antenna<br>Relative<br>Field | ERP<br>Watts | ERP<br>dBk | Distance to<br>Ground from<br>Antenna (m) | Free Space<br>Signal (dBu) | 2.5 dB Loss<br>for Reflection | Signal Strength<br>at Ground (dBu) | Circular Distance<br>From Tower (m) | Distance to<br>Contour using<br>Free Space (m) | Height of<br>Contour above<br>Ground (m) |
|-------------------------------------|------------------------------|--------------|------------|---|----------------------------|-------------------------------|------------------------------------|-------------------------------------|--|--|
| 90                                  | 0.001                        | 0.000        | -78.86     | 113.00                                    | 47.00                      | 0.0                           | 47.00                              | 0.00                                | 0.33   | 112.67                                   |
| 85                                  | 0.002                        | 0.000        | -72.84     | 113.43                                    | 52.99                      | 0.0                           | 52.99                              | 9.89                                | 0.65   | 112.35                                   |
| 80                                  | 0.009                        | 0.001        | -59.78     | 114.74                                    | 65.95                      | 0.0                           | 65.95                              | 19.92                               | 2.93   | 110.11                                   |
| 75                                  | 0.023                        | 0.007        | -51.63     | 116.99                                    | 73.93                      | 0.0                           | 73.93                              | 30.28                               | 7.49   | 105.76                                   |
| 70                                  | 0.049                        | 0.031        | -45.06     | 120.25                                    | 80.26                      | 0.0                           | 80.26                              | 41.13                               | 15.96  | 98.00                                    |
| 65                                  | 0.076                        | 0.075        | -41.24     | 124.68                                    | 83.76                      | 0.0                           | 83.76                              | 52.69                               | 24.76  | 90.56                                    |
| 60                                  | 0.120                        | 0.187        | -37.28     | 130.48                                    | 87.33                      | 0.0                           | 87.33                              | 65.24                               | 39.10  | 79.14                                    |
| 55                                  | 0.180                        | 0.421        | -33.76     | 137.95                                    | 90.37                      | 0.0                           | 90.37                              | 79.12                               | 58.65  | 64.96                                    |
| 50                                  | 0.250                        | 0.813        | -30.90     | 147.51                                    | 92.64                      | 0.0                           | 92.64                              | 94.82                               | 81.45  | 50.60                                    |
| 45                                  | 0.333                        | 1.442        | -28.41     | 159.81                                    | 94.44                      | 0.0                           | 94.44                              | 113.00                              | 108.50   | 36.28                                    |
| 40                                  | 0.425                        | 2.348        | -26.29     | 175.80                                    | 95.73                      | 0.0                           | 95.73                              | 134.67                              | 138.47   | 23.99                                    |
| 35                                  | 0.524                        | 3.569        | -24.47     | 197.01                                    | 96.56                      | 0.0                           | 96.56                              | 161.38                              | 170.73   | 15.07                                    |
| 30                                  | 0.625                        | 5.078        | -22.94     | 226.00                                    | 96.89                      | 0.0                           | 96.89                              | 195.72                              | 203.63   | 11.18                                    |
| 25                                  | 0.723                        | 6.795        | -21.68     | 267.38                                    | 96.70                      | 0.0                           | 96.70                              | 242.33                              | 235.56   | 13.45                                    |
| 20                                  | 0.815                        | 8.635        | -20.64     | 330.39                                    | 95.90                      | 0.0                           | 95.90                              | 310.46                              | 265.54   | 22.18                                    |
| 15                                  | 0.890                        | 10.297       | -19.87     | 436.60                                    | 94.25                      | 0.0                           | 94.25                              | 421.72                              | 289.98   | 37.95                                    |
| 10                                  | 0.950                        | 11.733       | -19.31     | 650.74                                    | 91.35                      | 0.0                           | 91.35                              | 640.85                              | 309.52   | 59.25                                    |
| 5                                   | 0.989                        | 12.716       | -18.96     | 1296.53                                   | 85.71                      | 0.0                           | 85.71                              | 1291.60                             | 322.23   | 84.92                                    |

Distance to Ground Level assumes flat ground or a site where the site level is above average terrain in all azimuths.

|                     |            |                         |       |                                      |       |
|---------------------|------------|-------------------------|-------|--------------------------------------|-------|
| Maximum ERP         | 13 watts   | Max dBu to Ground Level | 96.89 | Lowest Height of Interfering Contour | 11.18 |
| Radiation Center AG | 113.00 m   |                         |       |                                      |       |
| Radiation Center AG | 370.73 ft. |                         |       |                                      |       |
|                     |            |                         |       |                                      |       |
| Maximum ERP         | -18.86 dBk |                         |       |                                      |       |
| Protected dBu       | 57.80 dBu  |                         |       |                                      |       |
| Interfering dBu     | 97.80 dBu  |                         |       |                                      |       |
| Free Space Distance | 325.82 m   |                         |       |                                      |       |

ELECTRONICS RESEARCH, INC.  
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-----THEORETICAL-----  
VERTICAL PLANE RELATIVE FIELD

3-20-2002

2 ERI TYPE SHP, SHPX, LP, OR LPX ELEMENTS  
0 DEGREE(S) ELECTRICAL BEAM TILT  
0 PERCENT FIRST NULL FILL  
0 PERCENT SECOND NULL FILL

ELEMENT SPACING:  
0.5 WAVELENGTH

POWER GAIN IS .702 IN THE HORIZONTAL PLANE(.702 IN THE MAX.)

