Larry H. Will, P.E. **Broadcast Engineering**

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THE UNIVERSITY OF NORTH CAROLINA

LICENSEE OF W24BA

TYRON, NORTH CAROLINA

FCC FACILITY ID 69189

AND APPLICANT FOR CH 19

FCC File # BPTT-19990625JB

MINOR AMENDMENT TO A PENDING APPLICATION

Larry H. Will, P.E.
1055 Powderhorn Drive
Glen Mills, PA 19342-9504

THE UNIVERSITY OF NORTH CAROLINA

LICENSEE OF W24BA

TYRON, NORTH CAROLINA

FCC FACILITY ID 69189

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THE UNIVERSITY OF NORTH CAROLINA

DECLARATION OF LARRY H. WILL

Larry H. Will declares and says:

That he prepared the attached Engineering Exhibits on behalf of The University of North Carolina, applicant for a minor modification to a pending application for W24BA, a Non-commercial Educational TV Translator Station in Tryon, NC.

That he has been involved in radio and television broadcast engineering for over 34 years, and that his credentials are a mater of record with the Federal Communications Commission.

That he is a Registered Professional Engineer in Pennsylvania and New Jersey.

That all statements contained within this exhibit are true and accurate to the best of his knowledge and belief, and as to such statements made of belief, they are believed to be true, except for information for which the Federal Communications Commission takes official notice.

s/s Larry H. Will

_____

Larry H. Will
1055 Powderhorn Drive
Glen Mills, PA 19342-9504
(610) 399-1826

Date: 28 June 2002

THE UNIVERSITY OF NORTH CAROLINA

LICENSEE OF W24BA

MINOR MODIFICATION TO A PENDING

APPLICATION FOR A CHANNEL CHANGE

AS A RESULT OF DTV DISPLACEMENT

ENGINEERING EXHIBIT EE-2

INTRODUCTION AND BACKGROUND

As a result of the allotment of DTV channels, The University of North Carolina has a pending application to change the operation of W24BA, Tyron, NC (FCC File # BPTT-19990625JB) from UHF Channel 24 to UHF Channel 19 (zero offset). As requested informally by the commission MM staff, this instant exhibit is a minor modification to add terrain shielding and receiver antenna directivity factors to show no prohibited caused interference overlap with full service NTSC stations WKPT-TV, Channel 19z in Kingsport, TN., and WLTX(TV), Channel 19+ in Columbia, SC. ***The W24BA translator is a key transmission element in The University of North Carolina TV system and as such its continued uninterrupted operation is essential to the citizens of the State.***

CHANGES PROPOSED HEREIN

With this modification amendment, we are requesting a waiver of 74.705(d)(1), terrain shielding and receiver antenna directivity, with regard to NTSC stations WKPT-TV and WLTX(TV). In addition, to further reduce the potential of interference to WKPT-TV, we are also proposing to change the proposed precision frequency offset of CH 19 from zero to minus with this modification. As shown in Table 1, this proposed change causes no other overlap condition with any other full service NTSC or DTV station, Class A, or LPTV station.

REQUEST FOR A WAIVER OF 74.705(d)(1) BY MEANS OF TERRAIN SHIELDING WITH RESPECT TO WKPT-TV AND WLTX(TV)

1: WKPT-TV, Channel 19z, CP and LIC, Kingsport, TN.

WKPT-TV: WKPT-TV CP is located 129.7 km at a bearing of 4.2 degrees True from W24BA. WKPT-TV is licensed with 1260 kW at 707 meters HAAT and has an outstanding CP for 3890 kilowatts (DA) ERP at 705 meters HAAT with zero precision offset[1]. **With this modification, W24BA is proposing minus precision offset**. Since the WKPT-TV CP coverage exceeds the licensed coverage, we use the 64 dBu of the WKPT-TV CP to show full protection in figures 1 through 10. Without the use of terrain shielding, the proposed W24BA, Channel 19 36 dBu F(50,10) interference contour is predicted to overlap the WKPT-TV CP 64 dBu F(50,50) service contour from approximately 313 thru 45 degrees True from W24BA. However, as shown in Figures 1 through 10 which show the paths in 10 degree increments from the proposed W24BA transmitter site to receive locations at the southern edge of the WKPT-TV 64 dBu F(50,50) service area, there is complete terrain blockage to the edges of the WKPT-TV 64 dBu F(50,50) service area from the many mountain ranges located between the W24BA transmitter site and the WKPT-TV service contour. These plots are representative of all pertinent azimuths from W24BA to the WKPT-TV 64 dBu F(50,50) service area and include receive antenna off axis directivity loss. These intervening mountains result in an additional 5.1 to 41.7 dB of path loss to the proposed W24BA Channel 19- 19 dBu F(50,10) interference contour placing the W24BA signal level below receiver threshold in the WKPT-TV service area. Therefore the W24BA Channel 19- proposed operation at Tryon would not cause objectionable or prohibited interference to WKPT-TV in practice.

Thus utilizing terrain shielding and receiver antenna directivity, there is no predicted interference to the service areas of either the WKPT-TV licensed or CP facilities from the proposed W24BA operation on Channel 19. The actual W24BA (Channel 19) F(50,10) signal levels in this area will be at least 5.1 to 41.7 dB below the required 36 dBu F(50,10) value based

[1] The FCC on-line CBDS access is not clear as to the current status of WKPT-TV CP.

on the additional attenuation due to terrain shielding and antenna directivity and thus this proposal, with terrain shielding, is in compliance with 74.705(d)(1) with regard to co-channel interference to full service facilities.

2: WLTX(TV), Channel 19+, LIC, Columbia, SC.

WLTX(TV): WLTX(TV) is located 187.7 km at a bearing of 133.4 degrees True from W24BA. WLTX(TV) is licensed with 5000 kW (DA) at 533 meters HAAT. Without the use of terrain shielding, the proposed W24BA, Channel 19 36 dBu F(50,10) interference contour is predicted to overlap the WLTX(TV) 64 dBu F(50,50) service contour from approximately 116 thru 160 degrees True from W24BA. However, as shown in Figures 11 through 16 which show the paths in 10 degree increments from the proposed W24BA transmitter site to receive locations at the northwestern edge of the WLTX(TV) 64 dBu F(50,50) service area, there is only minimal terrain blockage to the edges of the WLTX(TV) 64 dBu F(50,50) service area These plots are representative of all pertinent azimuths from W24BA to the WLTX(TV) 64 dBu F(50,50) service area and include receive antenna directivity off axis loss. As shown in figures 11 through 16, the grazing paths result in an additional 2 to 26.8 dB of path loss to the proposed W24BA Channel 19- 19 dBu F(50,10) interference contour placing the W24BA signal level below receiver threshold in the WLTX(TV) service area (negative fade margin). In addition, as shown in Figure 17, while the W24BA 36 dBu F(50,10) contour overlaps the WLTX(TV) 64 dBu F(50,50) service area, the W24BA 42 dBu F(50,10) contour does not. The W24BA 42 dBu F(50,10) contour represents the effective interference contour when off axis receiver antenna directivity is taken into account. Therefore with receiver antenna directivity included, the W24BA Channel 19- proposed operation at Tryon would not cause objectionable or prohibited interference to WLTX(TV) in practice.

Thus utilizing terrain shielding and receiver antenna directivity, there is no predicted interference to the service area of the licensed facilities of WLTX(TV) from the proposed W24BA operation on Channel 19. The actual W24BA (Channel 19) F(50,10) signal levels in this area will be at least 2 to 26.8 dB below the required 36 dBu F(50,10) value based on the additional attenuation due to terrain shielding and antenna directivity and thus this proposal, with

terrain shielding, is in compliance with 74.706(d)(1) with regard to co-channel interference to full service facilities.

3: WTWB-DT, LEXINGTON, NC:

Since filing the original channel change application (File No. BPTT-19990625JB), the Lexington CH 19 DTV allotment[2], which was considered in our original application, now includes a CP for maximized facilities for WTWB-DT, again operating on Channel 19. WTWB-DT also has an STA for 9 kW ERP which is less than the allotted facilities, so will not be discussed further.

WTWB-DT is located 232.69 km at a bearing of 69.63 degrees from W24BA. WTWB-DT is on a co-channel to W24BA and with a CP for 800 kilowatts ERP at 576 meters HAAT[3]. As shown in Figure 18, without considering terrain shielding or receiver antenna directivity, the proposed W24BA translator 20 dBu F(50,10) interference contour is calculated to overlap the WTWB-DT 41 dBu F(50,90) contour on an arc from approximately 43 degrees thru 104 degrees True as measured from W24BA.

However, using the procedures of 74.705(e), there is considerable ***terrain shielding*** between these two facilities as shown in Figures 19 to 26. These figures, which include receiver directivity, plot the path from the W24BA transmitting antenna to the edge of the WTWB-DT 41 dBu service contour in 10 degree increments or less from 43 to 104 degrees True as measured from W24BA. In every case, there are from 1 to 6 intervening obstacles between the standard UHF DTV receive antenna oriented to WTWB-DT and the W24BA transmitting antenna. These obstacles provide additional path attenuation reducing the W24BA signal levels at the edge of the WTWB-DT contour sufficiently to prevent actual received interference to WTWB-DT from W24BA, as proposed herein.

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[2] The allotment was for WBFX(TV), now WTWB-DT.

[3] The allotted facilities were 84.5 kW at 297 meters HAAT.

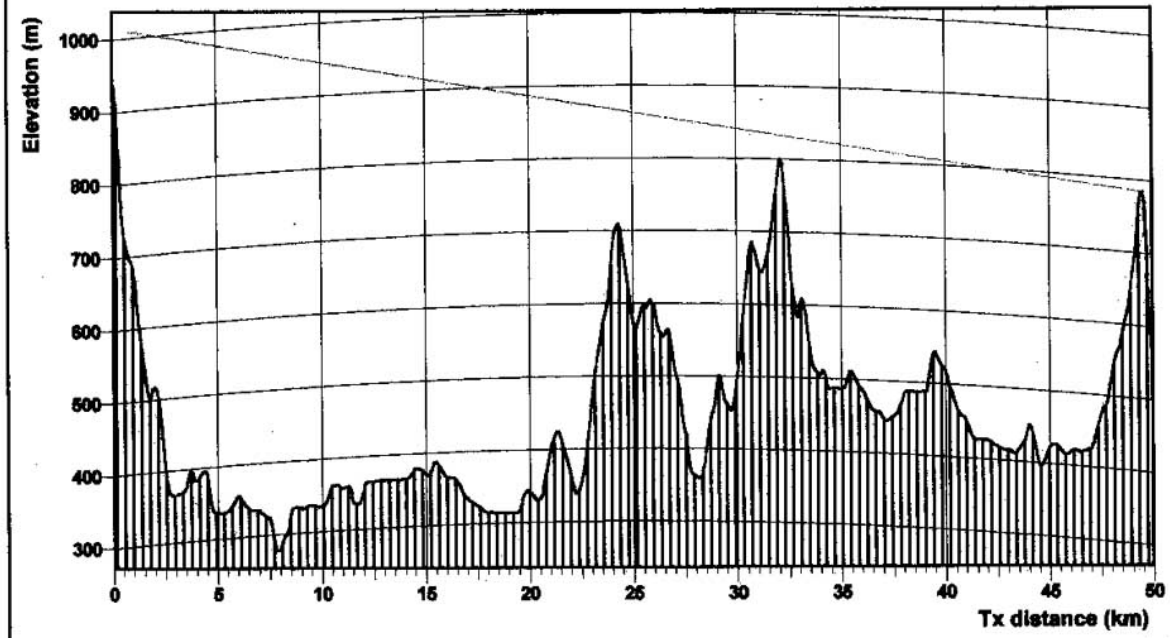
The terrain shielding of proposed W24BA to WTWB-DT is caused by a combination of the earth's curvature and various mountain peaks between W24BA and the WTWB-DT service area.

For the 50 degree radial, Figure 20, while there is only one obstacle, it is an 850 meter high mountain providing an additional 14.6 db excess path loss. For all radials, the excess path loss to the edge of the WTWB-DT 41 dBu service contour varies from 14.21 dB on the 70 degree radial to 40.91 dB on the 43 degree radial from W24BA contour placing the W24BA signal level below receiver threshold in the WTWB-DT service area. Therefore the W24BA Channel 19- proposed operation at Tryon would not cause objectionable or prohibited interference to WTWB-DT in practice.

Thus utilizing terrain shielding and receiver antenna directivity, there is no predicted interference to the WTWB-DT maximized CP *service area* from the proposed W24BA operation on Channel 19. The actual W24BA (Channel 19) F(50,10) signal levels in this area will be at least 9.2 dB below the required 20 dBu F(50,10) value based on the additional attenuation due to terrain shielding and antenna directivity and thus this proposal with terrain shielding is in compliance with 74.706(d)(1) with regard to co-channel interference to full service facilities.

The applicant will accept any received interference to its proposed operations that may be caused by these stations and agrees to remedy any actual caused interference to reception of these stations per 74.703(b).

Link Study: trn/W24BA-RX014.trn



SIGNAL™

Prop. model: Free Space + RMD
Time: 10.00 % Loc.: 50.00 %
Margin: 0.00 dB
Climate: Continental Temperate
Atm. factor: none
K factors: 1.333, 1.000, 1.000

Reliability Analysis
Fade outage method: Vigants-Barnett
C param. for Vigants-Barnett:
average prop. conditions: C=1
ITU-R terrain type: Inland
ITU-R refract. grad.: 10.0 %
External interf.: -100.0 dBmW
Dispersive fade margin: 50.0 dB
Ant. spacing (diversity): 0.0 m
Rain outage method: Crane
Rain region: A

Transmitter Site: W24BA
Name: Tryon, NC
Location:
N35°15'58.00" W82°14'40.00"
Site elevation: 931.4 m
Antenna height: 84.0 m
Pointing azimuth: 14.4 °
Transmitter power: 60.89 dBmW
Trans. line loss: 0.00 dB
Other losses: 0.00 dB
Antenna gain: 0.00 dBd
Antenna file:
Total ERP: 63.04 dBmW

Name: W24BA ->RX014
Frequency: 501.2500 MHz
Polarization: vertical
Length: 50.00 km
Number of obstacles: 1
Excess path loss: 29.34 dB
Atm. absorption loss: 0.00 dB
Path loss for stats: 149.77 dB
Flat fade margin: -26.55 dB
Total fade margin: -26.55 dB
Annual fade outage: 3942000.00 s
Annual rain outage: 0.00 s
Link availability: 50.0000 %

Receiver Site: RX014
Name: Grade B
Location:
N35°42'06.38" W82°06'23.31"
Site elevation: 541.1 m
Antenna height: 9.4 m
Pointing azimuth: 194.4 °
Trans. line loss: 0.00 dB
Other losses: 0.00 dB
Antenna gain: 0.00 dBd
Antenna file:
Received signal level: -84.58 dBmW

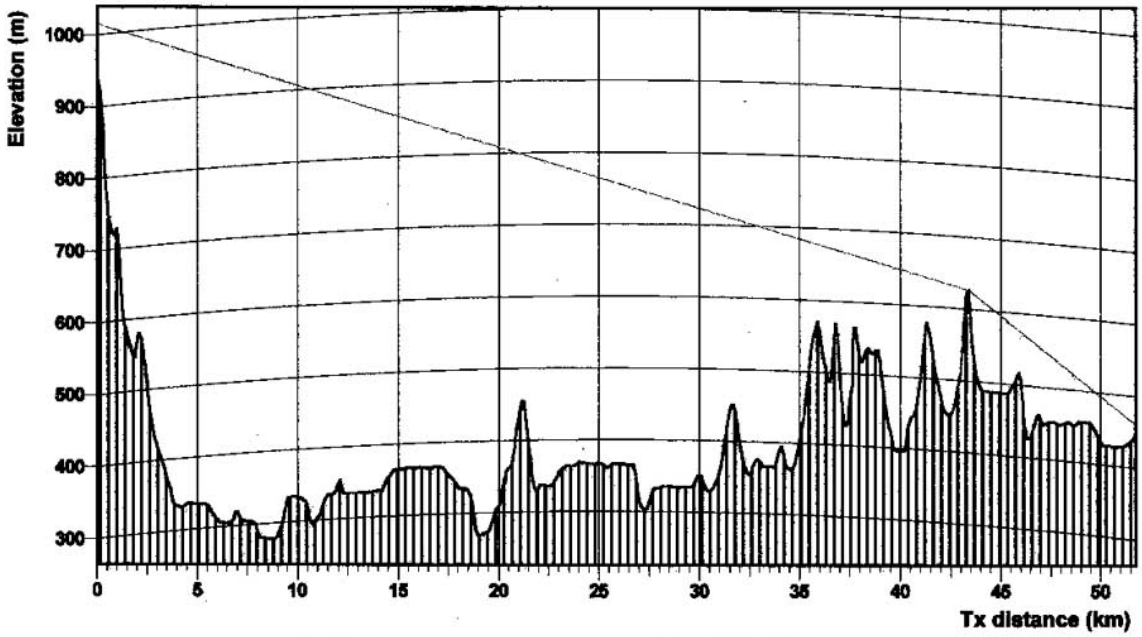
Notes
Profile and Path Loss to
WKPT-TV southern edge
of 64 dBu contour 14.4 deg.
True from W24BA.
prepared by
Larry H. Will, P.E.
Glen Mills, PA 19342-9504

PATH LOSS STUDY

W24BA to WKPT-TV

Figure 1 5/7/2002

Link Study: trn/W24BA-RX024.trn



SIGNAL™

Prop. model: Free Space + RMD
Time: 10.00 % Loc.: 50.00 %
Margin: 0.00 dB
Climate: Continental Temperate
Atm. factor: none
K factors: 1.333, 1.000, 1.000

Reliability Analysis
Fade outage method: Vigants-Barnett
C param. for Vigants-Barnett:
average prop. conditions: C=1
ITU-R terrain type: Inland
ITU-R refract. grad.: 10.0 %
External interf.: -100.0 dBmW
Dispersive fade margin: 50.0 dB
Ant. spacing (diversity): 0.0 m
Rain outage method: Crane
Rain region: A

Transmitter Site: W24BA
Name: Tryon, NC
Location:
N35°15'58.00" W82°14'40.00"
Site elevation: 931.4 m
Antenna height: 84.0 m
Pointing azimuth: 24.4 °
Transmitter power: 60.89 dBmW
Trans. line loss: 0.00 dB
Other losses: 0.00 dB
Antenna gain: 0.00 dBd
Antenna file:
Total ERP: 63.04 dBmW

Name: W24BA ->RX024
Frequency: 501.2500 MHz
Polarization: vertical
Length: 51.80 km
Number of obstacles: 1
Excess path loss: 13.76 dB
Atm. absorption loss: 0.00 dB
Path loss for stats: 134.50 dB
Flat fade margin: -11.27 dB
Total fade margin: -11.27 dB
Annual fade outage: 3942000.00 s
Annual rain outage: 0.00 s
Link availability: 50.0000 %

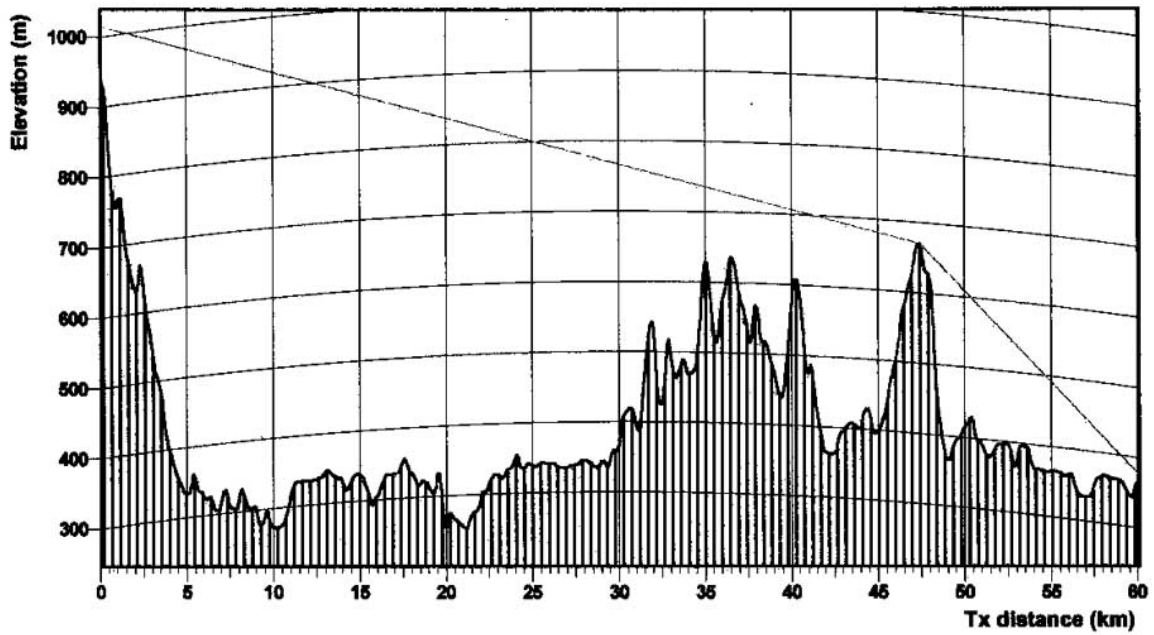
Receiver Site: RX024
Name: Grade B
Location:
N35°41'25.05" W82°00'25.87"
Site elevation: 450.2 m
Antenna height: 9.4 m
Pointing azimuth: 204.4 °
Trans. line loss: 0.00 dB
Other losses: 0.00 dB
Antenna gain: 0.00 dBd
Antenna file:
Received signal level: -69.31 dBmW

Notes
Profile and Path Loss to
WKPT-TV southern edge
of 64 dBu contour 24.4 deg.
True from W24BA.
prepared by
Larry H. Will, P.E.
Glen Mills, PA 19342-9504

PATH LOSS STUDY
W24BA to WKPT-TV

Figure 2 5/7/2002

Link Study: trn/W24BA-RX034.trn



SIGNAL™

Prop. model: Free Space + RMD
Time: 10.00 % Loc.: 50.00 %
Margin: 0.00 dB
Climate: Continental Temperate
Atm. factor: none
K factors: 1.333, 1.000, 1.000

Reliability Analysis
Fade outage method: Vigants-Barnett
C param. for Vigants-Barnett:
average prop. conditions: C=1
ITU-R terrain type: Inland
ITU-R refract. grad.: 10.0 %
External interf.: -100.0 dBmW
Dispersive fade margin: 50.0 dB
Ant. spacing (diversity): 0.0 m
Rain outage method: Crane
Rain region: A

Transmitter Site: W24BA
Name: Tryon, NC
Location:
N35°15'58.00" W82°14'40.00"
Site elevation: 931.4 m
Antenna height: 84.0 m
Pointing azimuth: 34.4 °
Transmitter power: 60.89 dBmW
Trans. line loss: 0.00 dB
Other losses: 0.00 dB
Antenna gain: 0.00 dBd
Antenna file:
Total ERP: 63.04 dBmW

Name: W24BA ->RX034
Frequency: 501.2500 MHz
Polarization: vertical
Length: 60.20 km
Number of obstacles: 1
Excess path loss: 16.47 dB
Atm. absorption loss: 0.00 dB
Path loss for stats: 138.51 dB
Flat fade margin: -15.29 dB
Total fade margin: -15.29 dB
Annual fade outage: 3942000.00 s
Annual rain outage: 0.00 s
Link availability: 50.0000 %

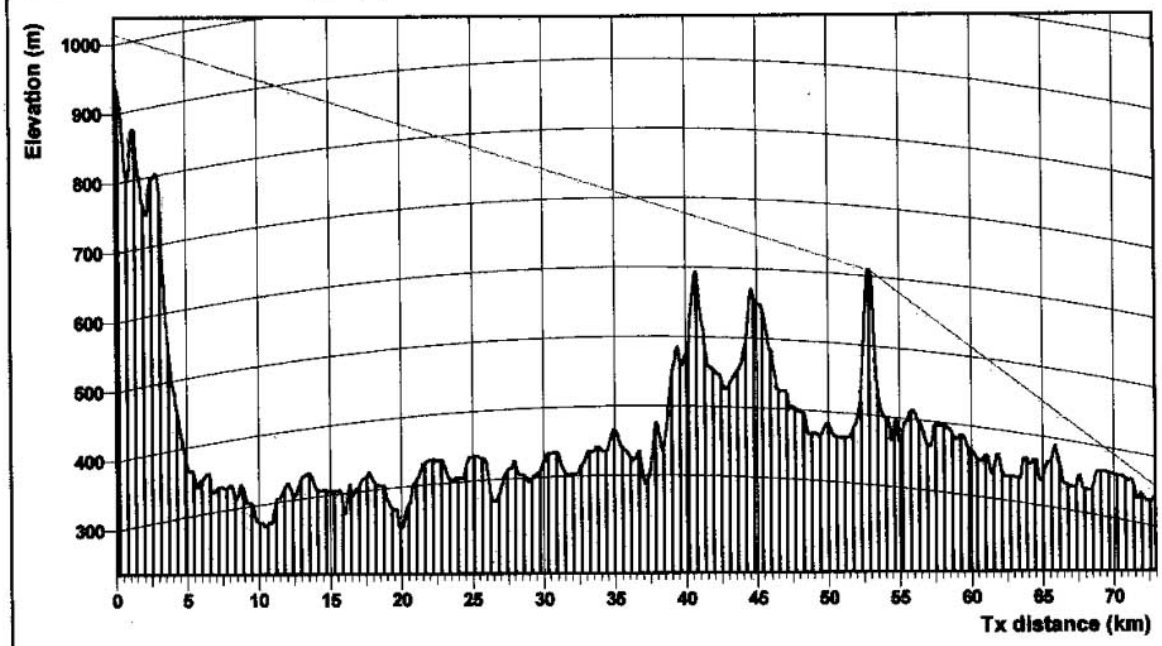
Receiver Site: RX034
Name: Grade B
Location:
N35°42'44.57" W81°52'02.42"
Site elevation: 365.0 m
Antenna height: 9.4 m
Pointing azimuth: 214.4 °
Trans. line loss: 0.00 dB
Other losses: 0.00 dB
Antenna gain: 0.00 dBd
Antenna file:
Received signal level: -73.32 dBmW

Notes
Profile and Path Loss to
WKPT-TV southern edge
of 64 dBu contour 34.4 deg.
True from W24BA.
prepared by
Larry H. Will, P.E.
Glen Mills, PA 19342-9504

PATH LOSS STUDY
W24BA to WKPT-TV

Figure 3 5/7/2002

Link Study: trn/W24BA-RX044.trn



SIGNAL™

Prop. model: Free Space + RMD
Time: 10.00 % Loc.: 50.00 %
Margin: 0.00 dB
Climate: Continental Temperate
Atm. factor: none
K factors: 1.333, 1.000, 1.000

Reliability Analysis
Fade outage method: Vigants-Barnett
C param. for Vigants-Barnett:
average prop. conditions: C=1
ITU-R terrain type: Inland
ITU-R refract. grad.: 10.0 %
External interf.: -100.0 dBmW
Dispersive fade margin: 50.0 dB
Ant. spacing (diversity): 0.0 m
Rain outage method: Crane
Rain region: A

Transmitter Site: W24BA
Name: Tryon, NC
Location:
N35°15'58.00" W82°14'40.00"
Site elevation: 931.4 m
Antenna height: 84.0 m
Pointing azimuth: 44.4 °
Transmitter power: 60.89 dBmW
Trans. line loss: 0.00 dB
Other losses: 0.00 dB
Antenna gain: 0.00 dBd
Antenna file:
Total ERP: 63.04 dBmW

Name: W24BA ->RX044
Frequency: 501.2500 MHz
Polarization: vertical
Length: 73.00 km
Number of obstacles: 1
Excess path loss: 9.36 dB
Atm. absorption loss: 0.00 dB
Path loss for stats: 133.08 dB
Flat fade margin: -9.86 dB
Total fade margin: -9.86 dB
Annual fade outage: 3942000.00 s
Annual rain outage: 0.00 s
Link availability: 50.0000 %

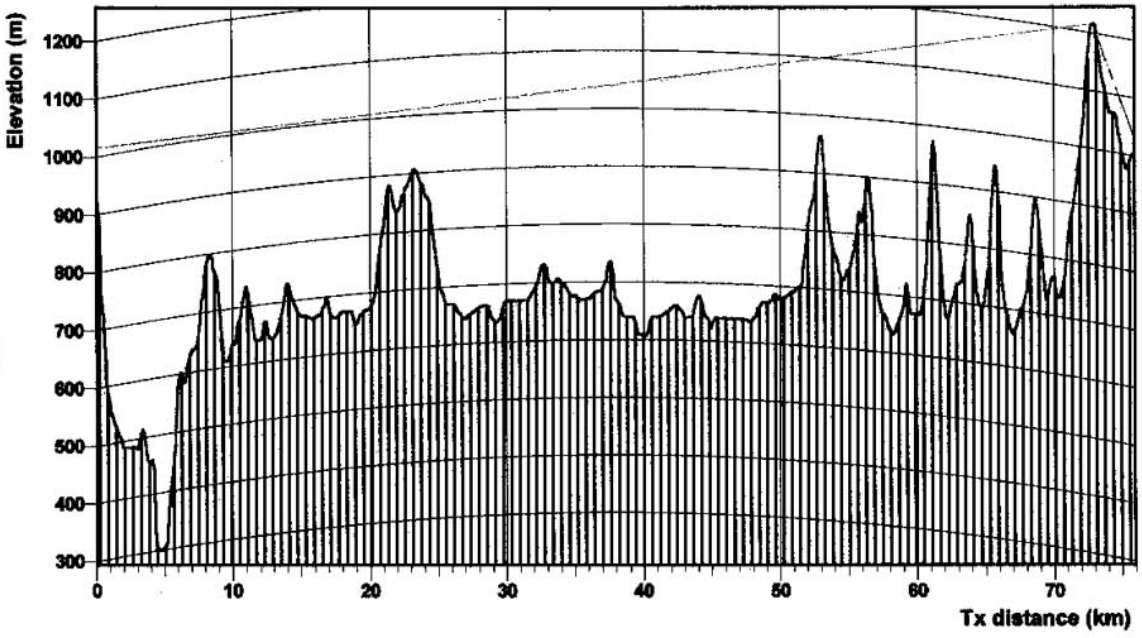
Receiver Site: RX044
Name: Grade B
Location:
N35°44'02.22" W81°40'41.04"
Site elevation: 348.0 m
Antenna height: 9.4 m
Pointing azimuth: 224.4 °
Trans. line loss: 0.00 dB
Other losses: 0.00 dB
Antenna gain: 0.00 dBd
Antenna file:
Received signal level: -67.89 dBmW

Notes
Profile and Path Loss to
WKPT-TV southern edge
of 64 dBu contour 44.4 deg.
True from W24BA.
prepared by
Larry H. Will, P.E.
Glen Mills, PA 19342-9504

PATH LOSS STUDY
W24BA to WKPT-TV

Figure 4 5/7/2002

Link Study: trn/W24BA-RX314.trn



SIGNAL™

Prop. model: Free Space + RMD
Time: 10.00 % Loc.: 50.00 %
Margin: 0.00 dB
Climate: Continental Temperate
Atm. factor: none
K factors: 1.333, 1.000, 1.000

Reliability Analysis
Fade outage method: Vigants-Barnett
C param. for Vigants-Barnett:
average prop. conditions: C=1
ITU-R terrain type: Inland
ITU-R refract. grad.: 10.0 %
External interf.: -100.0 dBmW
Dispersive fade margin: 50.0 dB
Ant. spacing (diversity): 0.0 m
Rain outage method: Crane
Rain region: A

Transmitter Site: W24BA
Name: Tryon, NC
Location:
N35°15'58.00" W82°14'40.00"
Site elevation: 931.4 m
Antenna height: 84.0 m
Pointing azimuth: 313.3 °
Transmitter power: 60.89 dBmW
Trans. line loss: 0.00 dB
Other losses: 0.00 dB
Antenna gain: 0.00 dBd
Antenna file:
Total ERP: 63.04 dBmW

Name: W24BA ->RX314
Frequency: 501.2500 MHz
Polarization: vertical
Length: 76.00 km
Number of obstacles: 1
Excess path loss: 19.26 dB
Atm. absorption loss: 0.00 dB
Path loss for stats: 143.33 dB
Flat fade margin: -20.11 dB
Total fade margin: -20.11 dB
Annual fade outage: 3942000.00 s
Annual rain outage: 0.00 s
Link availability: 50.0000 %

Receiver Site: RX314
Name: Grade B
Location:
N35°44'02.37" W82°51'25.52"
Site elevation: 1016.8 m
Antenna height: 9.4 m
Pointing azimuth: 133.3 °
Trans. line loss: 0.00 dB
Other losses: 0.00 dB
Antenna gain: 0.00 dBd
Antenna file:
Received signal level: -78.14 dBmW

Notes
Profile and Path Loss to
WKPT-TV southern edge
of 64 dBu contour 314.4 deg.
True from W24BA.
prepared by
Larry H. Will, P.E.
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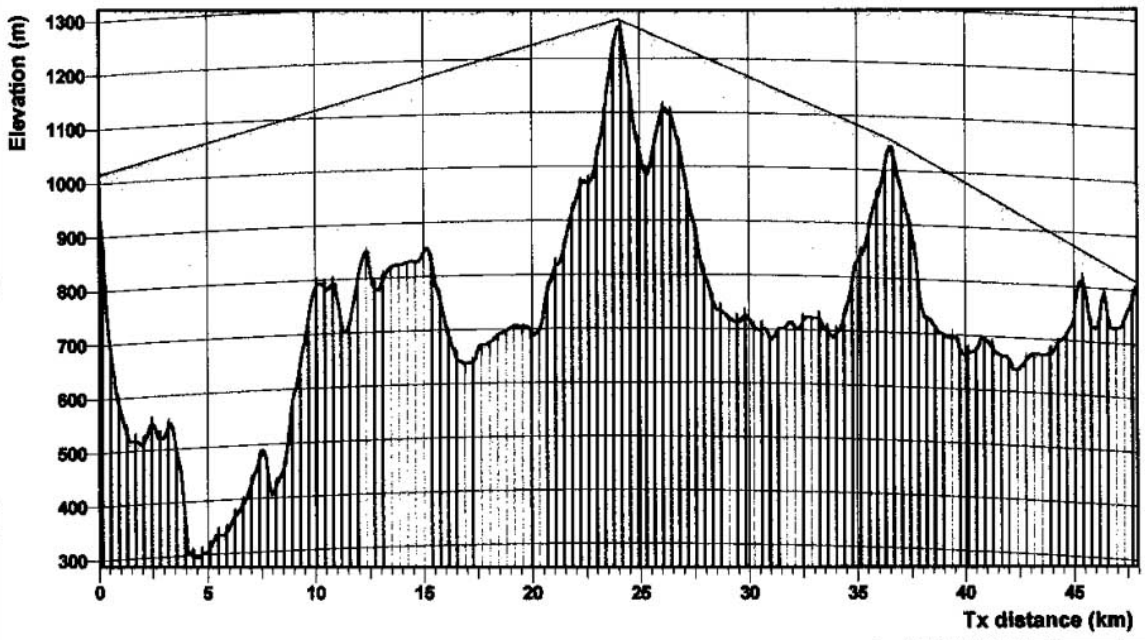
PATH LOSS STUDY
W24BA to WKPT-TV

Figure 5 5/7/2002

Link Study: trn/W24BA-RX334.trn



SIGNAL™

Prop. model: Free Space + RMD
Time: 10.00 % Loc.: 50.00 %
Margin: 0.00 dB
Climate: Continental Temperate
Atm. factor: none
K factors: 1.333, 1.000, 1.000

Reliability Analysis
Fade outage method: Vigants-Barnett
C param. for Vigants-Barnett:
average prop. conditions: C=1
ITU-R terrain type: Inland
ITU-R refract. grad.: 10.0 %
External interf.: -100.0 dBmW
Dispersive fade margin: 50.0 dB
Ant. spacing (diversity): 0.0 m
Rain outage method: Crane
Rain region: A

Transmitter Site: W24BA
Name: Tryon, NC
Location:
N35°15'58.00" W82°14'40.00"
Site elevation: 931.4 m
Antenna height: 84.0 m
Pointing azimuth: 334.4 °
Transmitter power: 60.89 dBmW
Trans. line loss: 0.00 dB
Other losses: 0.00 dB
Antenna gain: 0.00 dBd
Antenna file:
Total ERP: 63.04 dBmW

Name: W24BA ->RX334
Frequency: 501.2500 MHz
Polarization: vertical
Length: 48.00 km
Number of obstacles: 2
Excess path loss: 41.01 dB
Atm. absorption loss: 0.00 dB
Path loss for stats: 161.09 dB
Flat fade margin: -37.86 dB
Total fade margin: -37.86 dB
Annual fade outage: 3942000.00 s
Annual rain outage: 0.00 s
Link availability: 50.0000 %

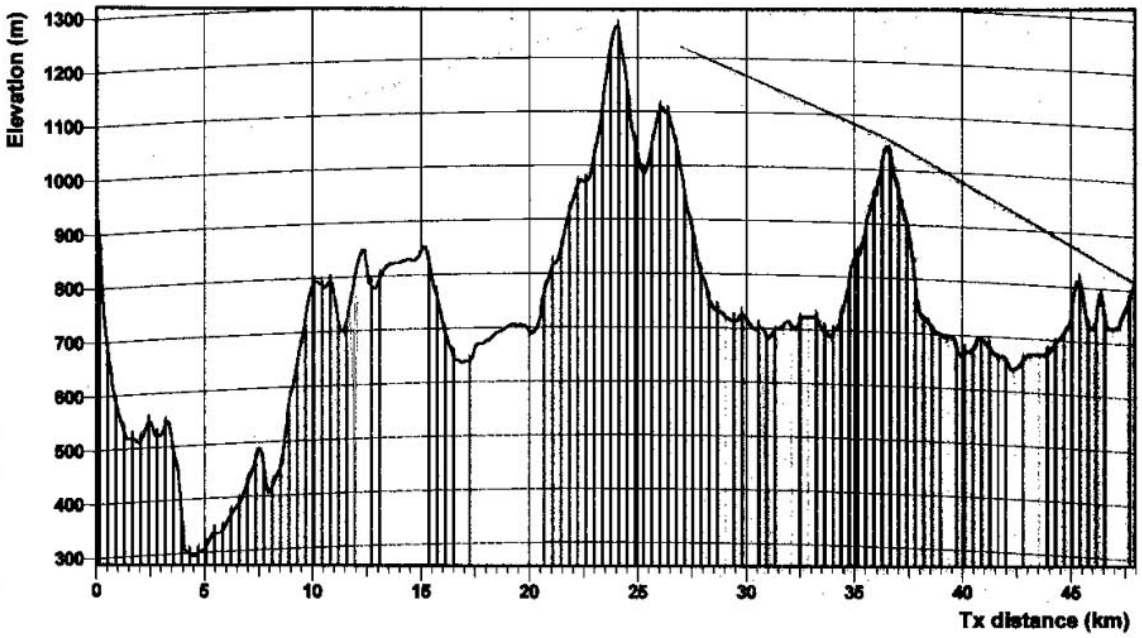
Receiver Site: RX334
Name: Grade B
Location:
N35°39'19.71" W82°28'26.24"
Site elevation: 804.5 m
Antenna height: 9.4 m
Pointing azimuth: 154.4 °
Trans. line loss: 0.00 dB
Other losses: 0.00 dB
Antenna gain: 0.00 dBd
Antenna file:
Received signal level: -95.90 dBmW

Notes
Profile and Path Loss to
WKPT-TV southern edge
of 64 dBu contour 324.4 deg.
True from W24BA.
prepared by
Larry H. Will, P.E.
Glen Mills, PA 19342-9504

PATH LOSS STUDY
W24BA to WKPT-TV

Figure 6 5/7/2002

Link Study: trn/W24BA-RX334.trn



SIGNAL™

Prop. model: Free Space + RMD
Time: 10.00 % Loc.: 50.00 %
Margin: 0.00 dB
Climate: Continental Temperate
Atm. factor: none
K factors: 1.333, 1.000, 1.000

Reliability Analysis
Fade outage method: Vigants-Barnett
C param. for Vigants-Barnett:
average prop. conditions: C=1
ITU-R terrain type: Inland
ITU-R refract. grad.: 10.0 %
External interf.: -100.0 dBmW
Dispersive fade margin: 50.0 dB
Ant. spacing (diversity): 0.0 m
Rain outage method: Crane
Rain region: A

Transmitter Site: W24BA
Name: Tryon, NC
Location:
N35°15'58.00" W82°14'40.00"
Site elevation: 931.4 m
Antenna height: 84.0 m
Pointing azimuth: 334.4 °
Transmitter power: 60.89 dBmW
Trans. line loss: 0.00 dB
Other losses: 0.00 dB
Antenna gain: 0.00 dBd
Antenna file:
Total ERP: 63.04 dBmW

Name: W24BA ->RX334
Frequency: 537.2500 MHz
Polarization: vertical
Length: 48.00 km
Number of obstacles: 2
Excess path loss: 41.64 dB
Atm. absorption loss: 0.00 dB
Path loss for stats: 162.32 dB
Flat fade margin: -39.10 dB
Total fade margin: -39.10 dB
Annual fade outage: 3942000.00 s
Annual rain outage: 0.00 s
Link availability: 50.0000 %

Receiver Site: RX334
Name: Grade B
Location:
N35°39'19.71" W82°28'26.24"
Site elevation: 804.5 m
Antenna height: 9.4 m
Pointing azimuth: 154.4 °
Trans. line loss: 0.00 dB
Other losses: 0.00 dB
Antenna gain: 0.00 dBd
Antenna file:
Received signal level: -97.13 dBmW

Notes
Profile and Path Loss to
WKPT-TV southern edge
of 64 dBu contour 314.4 deg.
True from W24BA.
prepared by
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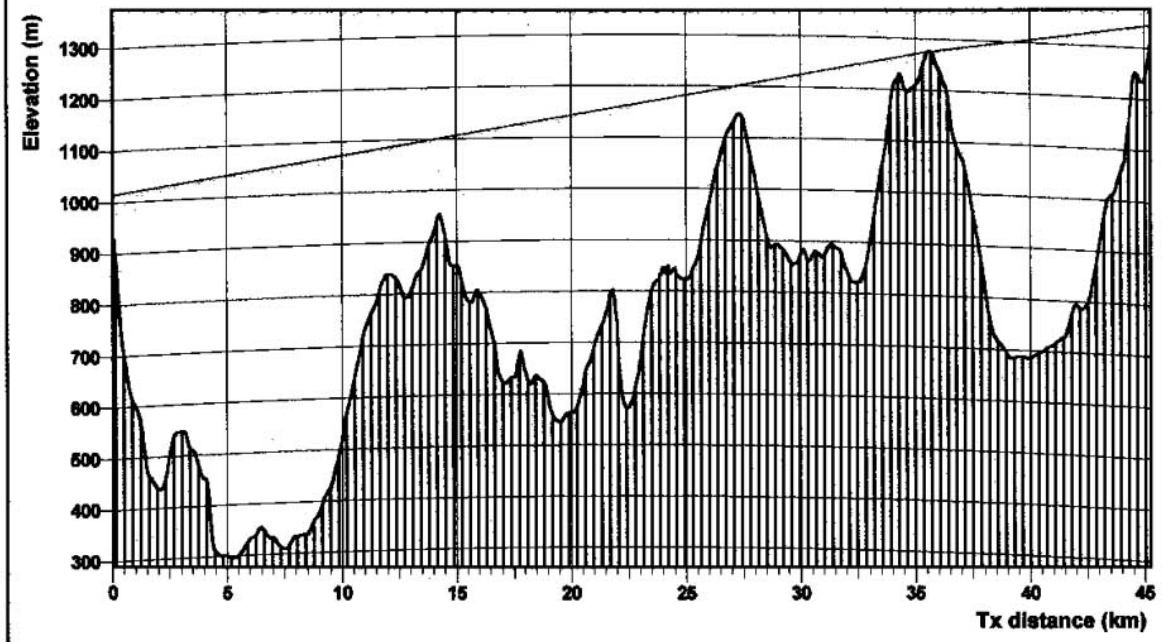
PATH LOSS STUDY
W24BA to WKPT-TV

Figure 7 5/7/2002

Link Study: trn/W24BA-RX344.trn



SIGNAL™

Prop. model: Free Space + RMD
Time: 10.00 % Loc.: 50.00 %
Margin: 0.00 dB
Climate: Continental Temperate
Atm. factor: none
K factors: 1.333, 1.000, 1.000

Reliability Analysis
Fade outage method: Vigants-Barnett
C param. for Vigants-Barnett:
average prop. conditions: C=1
ITU-R terrain type: Inland
ITU-R refract. grad.: 10.0 %
External interf.: -100.0 dBmW
Dispersive fade margin: 50.0 dB
Ant. spacing (diversity): 0.0 m
Rain outage method: Crane
Rain region: A

Transmitter Site: W24BA
Name: Tryon, NC
Location:
N35°15'58.00" W82°14'40.00"
Site elevation: 931.4 m
Antenna height: 84.0 m
Pointing azimuth: 344.4 °
Transmitter power: 60.89 dBmW
Trans. line loss: 0.00 dB
Other losses: 0.00 dB
Antenna gain: 0.00 dBd
Antenna file:
Total ERP: 63.04 dBmW

Name: W24BA ->RX344
Frequency: 501.2500 MHz
Polarization: vertical
Length: 45.30 km
Number of obstacles: 1
Excess path loss: 5.11 dB
Atm. absorption loss: 0.00 dB
Path loss for stats: 124.68 dB
Flat fade margin: -1.46 dB
Total fade margin: -1.46 dB
Annual fade outage: 3942000.00 s
Annual rain outage: 0.00 s
Link availability: 50.0000 %

Receiver Site: RX344
Name: Grade B
Location:
N35°39'31.25" W82°22'45.07"
Site elevation: 1335.7 m
Antenna height: 9.4 m
Pointing azimuth: 164.4 °
Trans. line loss: 0.00 dB
Other losses: 0.00 dB
Antenna gain: 0.00 dBd
Antenna file:
Received signal level: -59.49 dBmW

Notes
Profile and Path Loss to
WKPT-TV southern edge
of 64 dBu contour 344.4 deg.
True from W24BA.
prepared by
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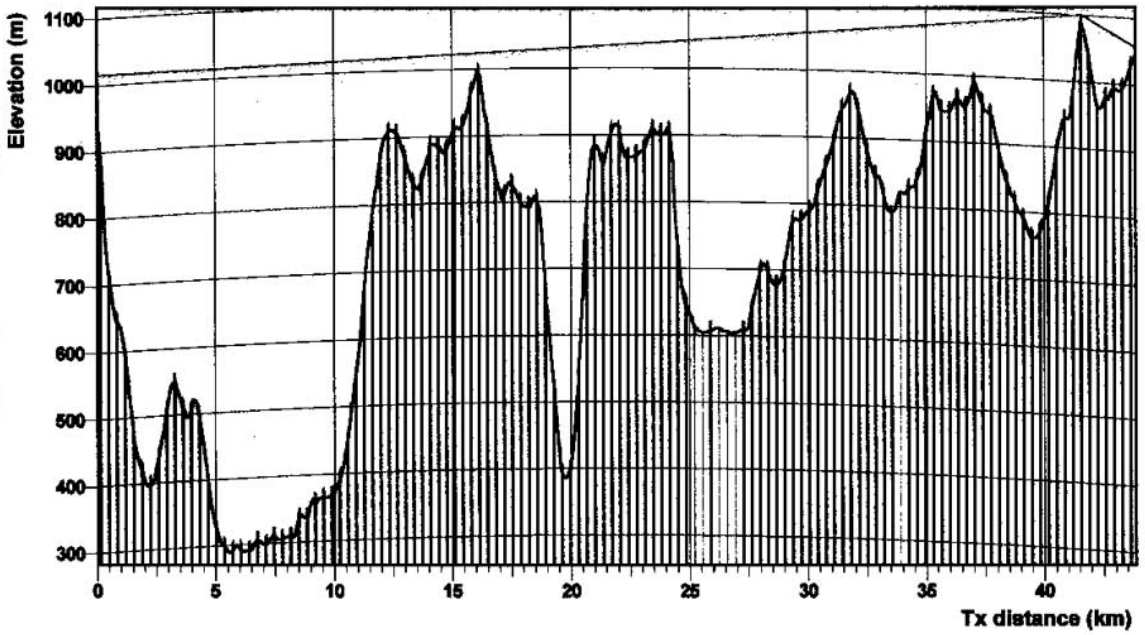
PATH LOSS STUDY
W24BA to WKPT-TV

Figure 8 5/7/2002

Link Study: trn/W24BA-RX354.trn



SIGNAL™

Prop. model: Free Space + RMD
Time: 10.00 % Loc.: 50.00 %
Margin: 0.00 dB
Climate: Continental Temperate
Atm. factor: none
K factors: 1.333, 1.000, 1.000

Reliability Analysis
Fade outage method: Vigants-Barnett
C param. for Vigants-Barnett:
average prop. conditions: C=1
ITU-R terrain type: Inland
ITU-R refract. grad.: 10.0 %
External interf.: -100.0 dBmW
Dispersive fade margin: 50.0 dB
Ant. spacing (diversity): 0.0 m
Rain outage method: Crane
Rain region: A

Transmitter Site: W24BA
Name: Tryon, NC
Location:
N35°15'58.00" W82°14'40.00"
Site elevation: 931.4 m
Antenna height: 84.0 m
Pointing azimuth: 354.4 °
Transmitter power: 60.89 dBmW
Trans. line loss: 0.00 dB
Other losses: 0.00 dB
Antenna gain: 0.00 dBd
Antenna file:
Total ERP: 63.04 dBmW

Name: W24BA ->RX354
Frequency: 501.2500 MHz
Polarization: vertical
Length: 43.90 km
Number of obstacles: 1
Excess path loss: 21.67 dB
Atm. absorption loss: 0.00 dB
Path loss for stats: 140.97 dB
Flat fade margin: -17.74 dB
Total fade margin: -17.74 dB
Annual fade outage: 3942000.00 s
Annual rain outage: 0.00 s
Link availability: 50.0000 %

Receiver Site: RX354
Name: Grade B
Location:
N35°39'33.31" W82°17'30.19"
Site elevation: 1047.0 m
Antenna height: 9.4 m
Pointing azimuth: 174.4 °
Trans. line loss: 0.00 dB
Other losses: 0.00 dB
Antenna gain: 0.00 dBd
Antenna file:
Received signal level: -75.78 dBmW

Notes
Profile and Path Loss to
WKPT-TV southern edge
of 64 dBu contour 354.4 deg.
True from W24BA.
prepared by
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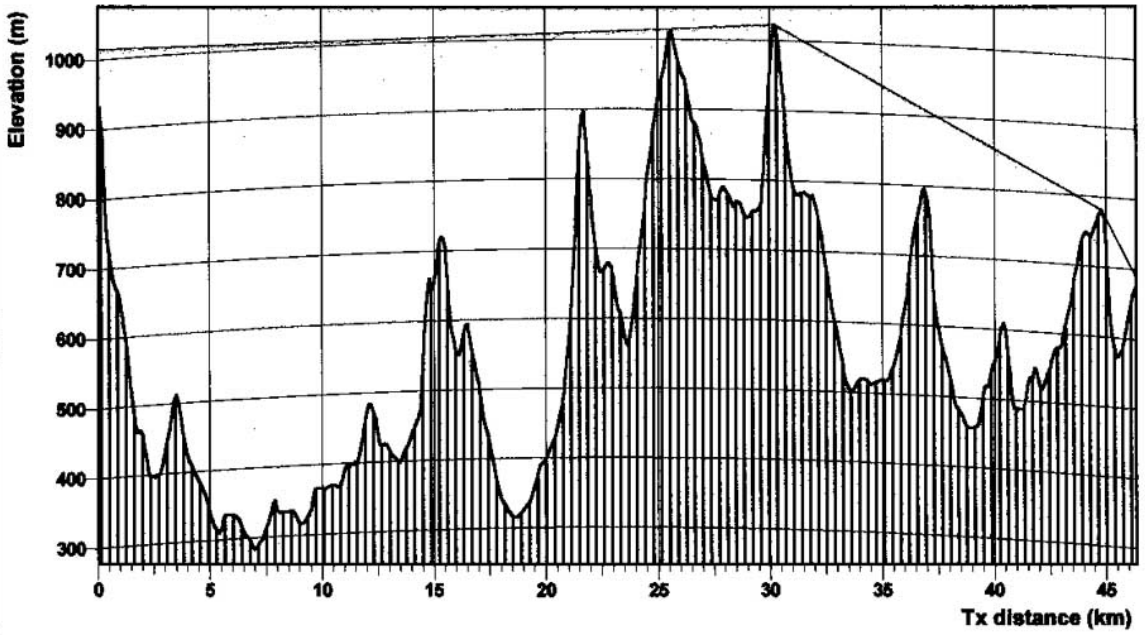
PATH LOSS STUDY
W24BA to WKPT-TV

Figure 9 5/7/2002

Link Study: trn/W24BA-WKPT0.trn



SIGNAL™

Prop. model: Free Space + RMD
Time: 10.00 % Loc.: 50.00 %
Margin: 0.00 dB
Climate: Continental Temperate
Atm. factor: none
K factors: 1.333, 1.000, 1.000

Reliability Analysis
Fade outage method: Vigants-Barnett
C param. for Vigants-Barnett:
average prop. conditions: C=1
ITU-R terrain type: Inland
ITU-R refract. grad.: 10.0 %
External interf.: -100.0 dBmW
Dispersive fade margin: 50.0 dB
Ant. spacing (diversity): 0.0 m
Rain outage method: Crane
Rain region: A

Transmitter Site: W24BA
Name: Tryon, NC
Location:
N35°15'58.00" W82°14'40.00"
Site elevation: 931.4 m
Antenna height: 84.0 m
Pointing azimuth: 4.2 °
Transmitter power: 60.89 dBmW
Trans. line loss: 0.00 dB
Other losses: 0.00 dB
Antenna gain: 0.00 dBd
Antenna file:
Total ERP: 63.04 dBmW

Name: W24BA ->WKPT0
Frequency: 501.2500 MHz
Polarization: vertical
Length: 46.40 km
Number of obstacles: 2
Excess path loss: 41.66 dB
Atm. absorption loss: 0.00 dB
Path loss for stats: 161.44 dB
Flat fade margin: -38.22 dB
Total fade margin: -38.22 dB
Annual fade outage: 3942000.00 s
Annual rain outage: 0.00 s
Link availability: 50.0000 %

Receiver Site: WKPT0
Name: Grade B Boresight
Location:
N35°40'56.96" W82°12'23.65"
Site elevation: 676.3 m
Antenna height: 9.4 m
Pointing azimuth: 184.2 °
Trans. line loss: 0.00 dB
Other losses: 0.00 dB
Antenna gain: 0.00 dBd
Antenna file:
Received signal level: -96.25 dBmW

Notes
Profile and Path Loss to
WKPT-TV southern edge
of 64 dBu contour 4.4 deg.
True from W24BA.
prepared by
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PATH LOSS STUDY
W24BA to WKPT-TV

Figure 10 5/7/2002