Before the
Federal Communications Commission
Washington, D.C. 20554

	)	
In the Matter of:	)	
	)	
Armstrong Utilities, Inc.	)	
	)	CSR 8752-M
Carriage Complaint of Western Pacific	)	
Broadcast, LLC, WACP-TV,	)	
Atlantic City, New Jersey	)	
	)	
To: Media Bureau	)	

SUPPLEMENTAL OPPOSITION

INTRODUCTION AND SUMMARY

Armstrong Utilities, Inc. ("Armstrong") files this Supplemental Opposition to provide additional evidence and argument not available when Armstrong filed its initial Opposition.[1]

Armstrong's Opposition focused on WACP's failure to deliver a good quality signal based on inadequate signal strength.[2] Since filing the Opposition, Armstrong installed a preamplifer and filter provided by WACP. Notwithstanding installation of WACP's additional equipment, the picture quality of WACP's signal remains grossly substandard. This Supplemental Opposition focuses on WACP's poor picture quality and requests dismissal of the Complaint consistent with standards articulated in *WRNN v. Cablevision*.[3]

As shown in the attached Supplemental Engineering Statement and Declaration of Edgar E. Hassler, Jr.,[4] WACP's poor picture quality is due mainly to an extraordinarily high level of packet loss, likely due to distance, terrain, interference, and other reasons. The signal

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[1] *Carriage Complaint of Western Pacific Broadcast, LLC, WACP-TV, Atlantic City, New Jersey,* CSR 8752-M, *Opposition of Armstrong Utilities, Inc.* (filed January 4, 2013) ("Opposition").
[2] Opposition at 5 – 6.
[3] *WRNN-TV Associates Limited Partnership v. Cablevision Systems Corporation,* 13 FCC Rcd 12654 (CSB 1998).
[4] Exhibit 1, Supplemental Engineering Statement and Declaration of Edgar E. Hassler, Jr. (June 27, 2013) ("Supplemental Engineering Statement").

also suffers from an erratic and periodically low S/N ratio. The Supplemental Engineering Statement includes multiple photographs of WACP's poor picture quality and a detailed analysis of WACP's digital signal as received at Armstrong's headend, showing consistently high levels of packet loss, periodic complete loss of signal, and an erratic S/N ratio. For comparison, the Supplemental Engineering Statement also includes a signal analysis of WGTW, another New Jersey-based must carry station received at the Oxford headend.

The evidence presented here aligns closely with the Cable Services Bureau decision in *WRNN v. Cablevision.*[5] In *WRNN*, the Bureau denied WRNN's must carry complaint due to picture quality problems similar to those demonstrated here.

In short, even after installing the equipment supplied by WACP, the poor quality of the Station's signal at Armstrong's headend results in grossly substandard picture quality. Consequently, the Complaint must fail.

[5] 13 FCC Rcd 12654.

BACKGROUND[6]

Armstrong Utilities, Inc. and the Oxford cable system. Armstrong operates 15 cable systems in four states, serving primarily smaller communities and rural areas. The Complaint involves Armstrong's Oxford, Pennsylvania system. Armstrong has operated the Oxford system since 1981. The Oxford system serves about 5,400 customers in several communities in southern Chester County. The system's service area is in the far western corner of the Philadelphia DMA.

Oxford is about 62 miles from WACP's transmitter, on the very edge of WACP's predicted NLSC, and more than 88 miles from Atlantic City, the station's community of license. Exhibit 2 contains a map depicting the Oxford system, showing the approximate distances between the system, WACP's transmitter and the NLSC.[7]

WACP. According to Warren's Online TVFactbook,[8] WACP is a commercial broadcast station licensed to Western Pacific Broadcasting, LLC, transmitting on channel 4 from Millville, NJ in the Philadelphia DMA. Atlantic City is the community of license for the station. WACP has never been carried on the Oxford system.

Communications between Armstrong and WACP. The following chronology details the communications between the parties.

June 2012. In early June 2012, Armstrong received a new station notice and must carry election from WACP's lawyer.[9] The letter stated, "The Station is a new station that is licensed to

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[6] For the reader's convenience, we have included background information and Exhibits provided in the Opposition. The supplemental background information begins on page 5.

[7] The map and NLSC in Exhibit 2 are reproduced from the FCC's online License database, available at: http://transition.fcc.gov/fcc-bin/contourplot.kml?gmap=2&appid=1503217&call=WACP&freq=0.0&contour=28&city=ATLANTIC_CITY&state=NJ.kml, visited on December 31, 2012.

[8] Available at http://www.tvcablefactbook.com/, visited on December 31, 2012.

[9] Exhibit 3, Letter from M. Scott Johnson to Dave Wittmann, dated June 6, 2012.

Atlantic City, NJ, which is part of the [Philadelphia] DMA. The Station is scheduled to begin commercial broadcasting on June 8, 2012. . . .Please note that this correspondence is ***not*** a demand for carriage, rather it is the election notice new stations are required to make under FCC Rule 76.64(f)(4)."[10] Given the express statement that the Station was not demanding carriage, and the substantial distance – between the system and the transmitter – 62 miles – and between the system and the Station's community of license – over 88 miles, Armstrong conducted a preliminary evaluation of the signal. Not surprisingly, the Station delivered a weak signal to Armstrong's distant headend.[11] Strong interference from another carrier compounded the problems with the signal.[12] In light of this, and the express statement that the Station was not demanding carriage, Armstrong awaited further communication from the WACP, anticipating an engineering proposal.[13]

September 2012. Instead of an engineering proposal, Armstrong received another letter from the Station's lawyer dated September 14, 2012.[14] Rather than communicate in any meaningful way regarding how to deliver a good quality signal to Armstrong's distant headend, the letter simply demanded carriage and made spurious allegations against Armstrong.

Through counsel, Armstrong responded to the September 14 letter via email dated September 21, 2012.[15] The Complaint alleges, "Armstrong did not respond to this carriage demand letter by the October 18, 2012 deadline imposed by Rule 76.61(a)(2) for its response."[16] As Exhibit 5 shows, Armstrong promptly responded to the September 14 letter.

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[10] Exhibit 3 at 1 (emphasis added).
[11] Supplemental Engineering Statement at 2.
[12] Supplemental Engineering Statement at 2.
[13] Supplemental Engineering Statement at 2.
[14] Exhibit 4, Letter from M. Scott Johnson to Dave Wittmann, dated September 14, 2012.
[15] Exhibit 5, Email from Christopher C. Cinnamon to M. Scott Johnson, dated September 21, 2012.
[16] Complaint at 3.

Armstrong's Signal Strength Test. Armstrong then conducted a thorough signal strength test, consistent with sound engineering practices and Commission requirements. Exhibit 6 contains the comprehensive test report.[17] The test results showed that the station failed to meet the signal strength threshold for commercial DTV stations as set forth in 47 CFR 76.55(c)(3).[18]

Based on this, Armstrong declined carriage by letter on November 19, 2012.[19] That letter included the Signal Test Report. WACP then filed the Complaint.

Communication with WACP's consulting engineer and installation of equipment.

Beginning in January 2013, Armstrong's Vice President of Engineering, Mr. Ed Hassler, began email communication with Mr. Todd Loney, consulting engineer for WACP.[20] That communication culminated in Armstrong's installation on April 17, 2013 of the following equipment selected and provided by WACP:

> Sitco Preamplifier Model No. PA24-F-4, Channel 4 (19 dB gain);
> Microwave Filter Company, Digital Bandpass Filter, Model No. 3303, Channel 4.

Following installation of the equipment, Mr. Hassler supervised additional testing and evaluation of the signal. As stated in the Supplement Engineering Statement:

> Predictably, the preamplifier increased the amplitude of the signal received over-the-air. But any increase in signal strength did not improve the signal quality. From an engineering perspective, the signal quality remains poor and unacceptable for retransmission on our cable system. The two main indicia of poor quality signal we observed are:
>
> - Poor picture quality
> - High packet loss

[17] Exhibit 6, Armstrong Signal Strength Test Report of October 2 – 3, 2012 testing of WACP ("Signal Test Report").
[18] Signal Test Report at 4.
[19] Exhibit 7, Letter from Christopher C. Cinnamon to M. Scott Johnson. The letter is dated November 19, 2013, a typographical error. The letter was signed and delivered on November 19, 2012.
[20] Supplemental Engineering Statement at 5.

> Our testing also shows an erratic and periodically low signal to noise ratio, which likely contributes to the poor signal quality.[21]

In summary, under *WRNN v Cablevision*,[22] based on the substantial evidence submitted in the Supplemental Engineering Statement, the Bureau must deny the Complaint because WACP fails to deliver a good quality signal to Armstrong's headend.

ANALYSIS

A. The Supplemental Engineering Statement shows WACP fails to deliver a good quality signal even after the installation of the Station's preamplifier and filter.

Armstrong denied WACP's must carry demand because the Station failed to deliver the required signal strength to the Oxford system's principal headend.[23] In an attempt to address this deficiency, the Station's consulting engineer requested installation of a specific preamp and filter.[24] Armstrong complied with this request, then thoroughly evaluated the resulting signal. The Supplemental Engineering Statement presents the results of that evaluation, concluding as follows:

> After installing the preamplifier and bandpass filter supplied by WACP, and after further testing and evaluation, I conclude: WACP fails to deliver a good quality signal to Armstrong's Oxford headend due to: (i) significantly degraded picture quality; (ii) extraordinarily high levels of dropped packets from the digital signal; and (iii) a signal-to-noise ratio materially lower than other broadcast signals carried on the system. In short, the equipment supplied by WACP only serves to amplify the station's signal problems. Absent extraordinary measures, WACP will not be able to deliver a good quality signal to Armstrong's Oxford headend.[25]

We briefly summarize below the evidence set forth in the Supplemental Engineering Statement, showing WACP's ongoing failure to deliver a good quality signal.

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[21] Supplemental Engineering Statement at 4.
[22] 13 FCC Rcd 12654.
[23] Exhibit 7.
[24] Supplemental Engineering Statement at 3.
[25] Supplemental Engineering Statement at 1.

1. WACP's signal problems result in seriously degraded picture quality.

As set forth in the Supplemental Engineering Statement, Armstrong installed the preamplifier and filter selected by WACP's consulting engineer.[26] Predictably, the preamplifier amplified the signal. But it did not help the signal quality problems. Mr. Hassler states:

> We monitored WACP's picture over multiple 24 hours periods after installing the equipment. The picture consistently suffered from substantial distortion, artifacts, and, at times, nearly complete picture loss. On April 29, 2013, over approximately a four hour period, I photographed multiple examples of WACP's picture as it is received at our Oxford headend. I attach copies of those photographs to this Supplemental Statement. The picture degradations fall into four general categories: (i) horizontal line distortion; (ii) picture freezing with loss of audio; (iii) tiling; and (iv) nearly complete picture loss.[27]

Exhibits 1 – 4 appended to the Supplemental Engineering Statement contain eleven photographs of WACP's signal, all taken by Mr. Hassler. Those pictures graphically demonstrate the grossly substandard picture quality delivered by WACP.

2. WACP's signal suffers from extraordinarily high levels of packet loss before reaching Armstrong's headend.

As set forth in the Supplemental Engineering Statement, the main reason for WACP's poor picture quality is the extraordinarily high level of packet loss from the signal as received at Armstrong's headend.[28] Exhibit 5 of the Supplemental Engineering Statement is a digital signal report produced by IneoQuest Technologies, measuring WACP's signal over a 48 hour period.[29] The IneoQuest Report includes three measures of packet loss, each displayed graphically. As explained in the Supplemental Engineering Statement, these are:

- Media Loss (the number of lost packets in each 15 minute period);
- Media Loss Secs (The number of seconds in each 15 minute period during which lost packets are occurring); and

[26] Supplemental Engineering Statement at 3.
[27] Supplemental Engineering Statement at 4.
[28] Supplemental Engineering Statement at 5.
[29] Supplemental Engineering Statement, Exhibit 5 ("WACP IneoQuest Report").

- Outage events (Instances of complete signal loss in each 15 minute period).[30]

In the WACP IneoQuest Report, each of these measures shows extraordinary high levels of packet loss.

For comparison, Exhibit 6 of the Supplemental Engineering Statement contains a 24 hour IneoQuest Report for WGTW, another New Jersey-based must carry station received at the Oxford headend.[31]

WACP IneoQuest Report – Media Loss Graphs. The Media Loss graphs in the WACP IneoQuest Report show total 48 hour packet loss of over 559,000 packets, with a 24 hour average packet loss of nearly 280,000 packets.[32] In contrast, the WGTW report shows a 24 hour total packet loss of approximately 700 packets.[33]

Mr. Hassler's analysis discusses how the poor picture quality results from the high level of packet loss:

> The 24 hour packet loss rate for WACP was 400 times greater than that for WGTW. The extraordinarily high packet loss rate shown on the IneoQuest Report helps explain the poor picture quality received at the Oxford headend. In short, due to signal problems, the station does not deliver the necessary number of digital packets to consistently display complete and clear digital images. The result: distortion, tiling, and periodic complete signal loss.[34]

WACP IneoQuest Report – Media Loss Secs Graphs. The Media Loss Secs graphs show the number of seconds in each 15 minute period during which measurable packet loss occurs. This measure helps show if packet loss is temporally isolated or more chronic. The Media Loss Secs graphs in the WACP IneoQuest Report show chronic packet loss - significant

[30] Supplemental Engineering Statement at 5
[31] Supplemental Engineering Statement, Exhibit 6 ("WGTW IneoQuest Report").
[32] Supplemental Engineering Statement at 6 - 7.
[33] Supplemental Engineering Statement at 7.
[34] Supplemental Engineering Statement at 7.

packet loss for approximately 11,000 seconds during the 48 hour period.[35] In contrast, the WGTW IneoQuest Report shows packet losses occurred during a total of only five seconds during a 24 hour period.[36] Mr. Hassler explains, "the extraordinary frequency of packet loss shown on the IneoQuest report helps explain the unacceptable picture quality received at the Oxford headend."[37]

WACP IneoQuest Report – Outage Event Graphs. The Outage Event Graphs show complete loss of signal.[38] The Outage Event Graphs in the WACP IneoQuest Report show 21 complete outages, an average of over 10 times per day.[39] Referencing the photographs appended to the Supplemental Statement, Mr. Hassler explains, "This would explain the picture freezing and complete loss of audio shown in Exhibit 2 and the complete picture loss shown in Exhibit 4."[40] For comparison, the Outage Event graph from the WGTW IneoQuest report shows zero Outage Events in 24 hours.[41]

Mr. Hassler's analysis of WACP's packet loss problems concludes as follows:

> Based on my observations of the picture quality as monitored at the Oxford headend, and based on the data presented in the IneoQuest Report, all conducted after installing the preamp and filter requested by WACP's engineer, I conclude that the signal quality is unacceptable due to the extraordinarily high level of packet loss. Due to distance, terrain, inference, or other reasons, a sufficiently high number of packets in the digital signal are not arriving at the headend, resulting in poor signal quality.[42]

In short, installing equipment will not solve the problem. Absent extraordinary measures, WACP will never deliver a good quality signal to Armstrong's headend.

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[35] Supplemental Engineering Statement at 8.
[36] Supplemental Engineering Statement at 8.
[37] Supplemental Engineering Statement at 8-9.
[38] Supplemental Engineering Statement at 9.
[39] Supplemental Engineering Statement at 9.
[40] Supplemental Engineering Statement at 9.
[41] Supplemental Engineering Statement at 10.
[42] Supplemental Engineering Statement at 10.

3. WACP's signal suffers from erratic and low S/N ratio.

As the Supplemental Engineering Statement concludes, the extraordinarily high level of packet loss is the main problem with WACP's signal. In addition, as the WACP IneoQuest Reports shows, WACP's "signal frequently suffers from relatively high noise levels, frequently dropping below 25 and periodically dropping to zero."[43] The Supplemental Engineering Statement includes S/N ratio graphs for both WACP and WGTW.[44] Comparing both graphs shows how WACP's S/N ratio is relatively erratic, lower on average, and, at times, substantially lower. Again, these measurements were taken after installing the equipment requested by WACP.

B. Under *WRNN v. Cablevision*, the evidence presented by Armstrong compels dismissal of the Complaint.

Most signal quality disputes are quantitative, centering on whether the station's signal meets the required signal strength threshold. Few cases deal with the qualitative aspect of a good quality signal. The lead picture quality case is *WRNN v. Cablevision* .[45] Applying that decision to the facts of this case compels dismissal of WACP's complaint.

The facts in *WRNN v. Cablevision* closely align with this case. Cablevision denied must carry based on inadequate signal strength. The broadcaster requested installation of specialized amplification equipment.[46] Although the equipment amplified the signal at Cablevision's headend, Cablevision continued to deny must carry based on poor picture quality.[47] In support, Cablevision submitted the following evidence:

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[43] Supplemental Engineering Statement at 11.
[44] Supplemental Engineering Statement at 10 – 11.
[45] 13 FCC Rcd 12654
[46] 13 FCC Rcd at 12658.
[47] *Id.*

- Correspondence from Cablevision's engineer attesting to picture problems, including "significant background static, a constant cluster of horizontal lines, and intermittent interference causing temporary loss of the picture."[48]
- Carrier to noise ratio measurements showing WRNN's C/N ratio was well below that which Cablevision ordinarily requires of off-air signals.[49]
- Signal-to-noise measures showing WRNN's S/N ratio was lower than that of two other UHF stations carried and below the poorest quality signal carried on the system.[50]

In light of this evidence, the Bureau denied WRNN's complaint:

> The sole issue in contention in this case is the picture quality of WRNN's signal when carried on Cablevision's Yonkers System. It is undisputed that WRNN meets the Commission's signal strength requirements and that, but for the issue of picture quality, WRNN is entitled to carriage on the Yonkers System. The Commission does not have picture quality standards for broadcast must-carry stations other than its signal strength requirements: The presumption is that satisfaction of the Commission's signal strength requirements will produce a good quality signal. Signal strength, however, is only one element of picture quality determination. There are some instances where amplifying a signal in order to obtain the required signal strength does not produce a satisfactory picture but, rather, simply results in an amplification of signal defects. When picture quality is at issue in must-carry proceedings, the Commission must weigh the evidence presented by the parties to the case, but the burden of proof lies with the cable operator alleging poor quality. Cablevision has the burden of proving that WRNN is not entitled to carriage because it does not deliver a quality picture. We find that Cablevision has met its burden.[51]

In all relevant respects, the facts of *WRNN v. Cablevision* align with our case. As in *WRNN*, WACP has provided amplification equipment to attempt to address its signal problems. The equipment succeeded in amplifying the signal, but the resultant picture quality is grossly

[48] *Id.*
[49] *Id.*
[50] *Id.*
[51] 13 FCC Rcd at 12661 (footnotes omitted)(emphasis added).

substandard. Armstrong has submitted substantial engineering evidence demonstrating the technical reasons for the poor signal quality, as well as numerous examples of poor picture quality.

The main difference between the cases is that the signal involved in *WRNN* was analog, and WACP's signal is digital. Because WACP's signal is digital, the extraordinarily high level of high packet loss is the main reason for the poor picture quality.

Here, this is a distinction without a difference. Armstrong has submitted substantial evidence showing that WACP fails to deliver a quality picture. The Bureau must dismiss the Complaint.

CONCLUSION and REQUESTED RELIEF

WACP does not deliver a good quality picture to Armstrong's Oxford headend. Absent extraordinary measures, it will never do so. The Bureau must dismiss the Complaint.

The undersigned verifies that he or she has read this Supplemental Opposition and to the best of his or her knowledge, information and belief formed after reasonable inquiry, the Supplemental Opposition is well grounded in fact and is warranted by existing law, and it is not interposed for any improper purpose.

Respectfully submitted,

By: _____

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June 28, 2013

Attorneys for Armstrong Utilities, Inc.

Certificate of Service

I, Alma Hoxha, paralegal with Cinnamon Mueller, certify that copies of the foregoing Opposition were delivered by me to the United States Postal Service on June 28, 2013 to be delivered to the person listed below for delivery via First Class Mail, postage prepaid, and email.

Alma Hoxha

M. Scott Johnson
Fletcher, Heald & Hildreth
1300 North 17th Street, 11th Floor
Arlington, VA 22209
sjohnson@fhhlaw.com

Attorney for Western Pacific Broadcast, LLC

EXHIBIT 1

Before the
Federal Communications Commission
Washington, D.C. 20554

	)	
In the Matter of:	)	
	)	
Armstrong Utilities, Inc.	)	
	)	CSR 8752-M
Carriage Complaint of Western Pacific	)	
Broadcast, LLC, WACP-TV,	)	
Atlantic City, New Jersey	)	
	)	
To: Media Bureau	)	

SUPPLEMENTAL ENGINEERING STATEMENT AND DECLARATION OF

EDGAR E. HASSLER, JR.

I submit this Supplemental Engineering Statement and Declaration in support of the Supplemental Opposition of Armstrong Utilities, Inc. to the must carry complaint filed by WACP. This Supplemental Statement focuses on WACP's signal ***quality*** problems and supports our request to deny the station's must carry complaint on signal quality grounds.

After installing the preamplifier and bandpass filter supplied by WACP, and after further testing and evaluation, I conclude: WACP fails to deliver a good quality signal to Armstrong's Oxford headend due to: (i) significantly degraded picture quality; (ii) extraordinarily high levels of dropped packets from the digital signal; and (iii) a signal-to-noise ratio materially lower than other broadcast signals carried on the system. In short, the equipment supplied by WACP only serves to amplify the station's signal problems. Absent extraordinary measures, WACP will not be able to deliver a good quality signal to Armstrong's Oxford headend.

Professional Background. I am the Vice President of Engineering for Armstrong Utilities, Inc. I have worked for the company in various engineering capacities for 47 years. My

current responsibilities include engineering oversight of Armstrong's multiple headends and over 11,000 miles of distribution plant and associated electronics.

I have been engaged in analyzing broadcast signal carriage on Armstrong's cable systems for my entire career with the company. I have evaluated carriage issues related to at least 200 different broadcast stations, and have analyzed signal strength and other issues in at least 50 must carry situations. I am experienced in the Commission's signal testing requirements and standards for stations seeking must carry.

I hold a Bachelor of Science degree in Electrical Engineering from Geneva College and a certificate in Electronic Communications from the Electronics Institute of Pittsburgh. I am a member of the Society of Cable Television Engineers. I am also an FCC licensee, holding a General Class Radiotelephone license with ship radar endorsement, and an amateur radio extra class license, call sign KE3H.

Initial signal evaluation of WACP. In June 2012, WACP's must carry election was sent to me for evaluation. Upon learning that the station was licensed to Atlantic City, NJ, more than 88 miles from our Oxford headend, with a transmitter in Millville, NJ, about 62 miles from our headend, I directed that an initial signal strength evaluation be conducted. Predictably, given the distance, that evaluation showed a weak signal. The reception problems resulting from the weak signal were compounded by interference from a much stronger carrier at 72 MHz. Based on the statement in the station's letter that "<u>this correspondence is not a demand for carriage, rather it is the election notice new stations are required to make under FCC Rule 76.64(f)(4),</u>" we did not conduct a full signal strength test at that time. We waited to hear more on what the station intended to do. Based on my past experience, I expected to hear from the station manager or engineer on how they planned to deal with the signal strength issue.

No engineering contact from the station.

We received no further communication from the station until its September 14, 2012 must carry demand letter. I was not contacted by the station's consulting engineer until January 2013.

October 2012 signal strength test.

To document compliance with Commission signal testing requirements, I have prepared a test report format for use by our company. The test report for WACP is attached as Exhibit 6 to our initial Opposition to the complaint. The test report describes the test equipment and procedures, and provides an hour-by-hour report of signal measurements. This is the same test report and testing methodology the FCC approved in a case involving WFMZ and our Oxford system. *Maranatha Broadcasting Company v. Armstrong Utilities, Inc*. 21 FCC Rcd 7140 (2006). There are no material differences in the testing methodology between the WFMZ test and the WACP test.

As shown in the report, WACP's signal fell short of the -61 dBm required to qualify for must carry. The average signal level over the period was -64.41 dBm.

Based on these test results, I directed our attorneys to notify the station that Armstrong declined carriage on the Oxford system, which they did in November 2012. With that letter, we provided a complete copy of the test report to the station's attorney. In December 2012, WACP filed its must carry complaint.

Communication with WACP's consulting engineer and installation of equipment.

Beginning in January 2013, I began email communication with Mr. Todd Loney, consulting engineer for WACP. That communication culminated in our installation, at Mr. Loney's request, of the following equipment provided by WACP:

Sitco Preamplifier Model No. PA24-F-4, Channel 4 (19 dB gain)
Microwave Filter Company, Digital Bandpass Filter, Model No. 3303, Channel 4

We completed the equipment installation on April 17, 2013.

Signal testing and evaluation after equipment installation.

Following installation of the equipment provided by WACP, we tested and evaluated the signal. Predictably, the preamplifier increased the amplitude of the signal received over-the-air. But any increase in signal strength did <u>not</u> improve the signal quality. From an engineering perspective, the signal quality remains poor and unacceptable for retransmission on our cable system. The two main indicia of poor quality signal we observed are:

- Poor picture quality
- High packet loss

Our testing also shows an erratic and periodically low signal to noise ratio, which likely contributes to the poor signal quality.

I explain further below, and reference the Exhibits attached to this Statement.

Poor picture quality

We monitored WACP's picture over multiple 24 hours periods after installing the equipment. The picture consistently suffered from substantial distortion, artifacts, and, at times, nearly complete picture loss. On April 29, 2013, over approximately a four hour period, I photographed multiple examples of WACP's picture as it is received at our Oxford headend. I attach copies of those photographs to this Supplemental Statement. The picture degradations fall

into four general categories: (i) horizontal line distortion;[1] (ii) picture freezing with loss of audio;[2] (iii) tiling;[3] and (iv) nearly complete picture loss.[4]

As Armstrong's Chief Engineer, based on the consistent distortion of WACP's video images, I can only conclude the picture quality of WACP's signal is unacceptable for our cable system.

High Packet Loss

Our signal analysis software suggests the primary reason for the poor picture quality is the extraordinarily high level of packet loss in the signal as received at our Oxford headend. Likely due to a combination of distance, terrain, and other interference, a significant portion of WACP's digital signal simply does not reach our Oxford headend. High packet loss is consistent with the poor picture quality we consistently observe, examples of which are included in Exhibits 1 through 4.

IneoQuest Signal Monitoring and Reporting. Exhibits 5 and 6 contain reports produced by IneoQuest Technologies, Inc. signal monitoring and evaluation software. We use IneoQuest's technology to monitor our signals at the Oxford headend. Exhibit 5 contains an IneoQuest Report for WACP, and Exhibit 6 contains an IneoQuest Report for station WGTW (Channel 48, Burlington, New Jersey). WGTW is another New Jersey-based must carry station received at our Oxford headend, and I include that report as a basis for comparison. The IneoQuest Reports are important for understanding and documenting the problems with WACP's signal, and a brief general explanation of what the Reports contain may be helpful for the reader.

The Report displays the following measures of digital signal quality in graph format :[5]

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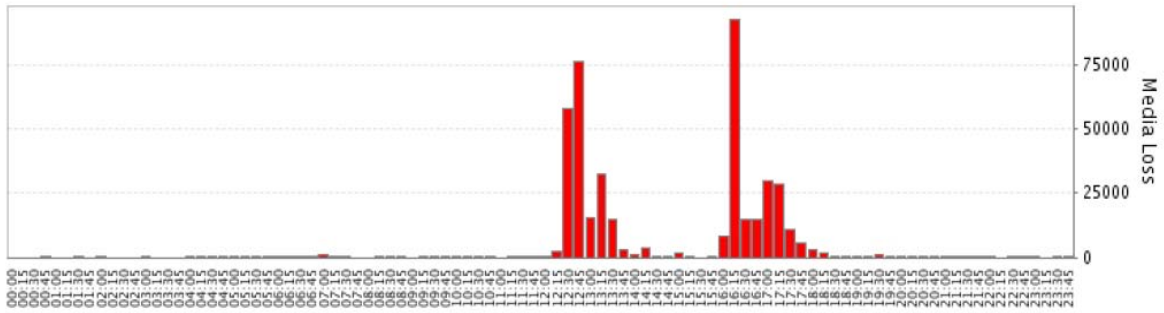
[1] Exhibit 1, Photos A – F.
[2] Exhibit 2, Photos G – H.
[3] Exhibit 3, Photos I – J.
[4] Exhibit 4, Photo K.

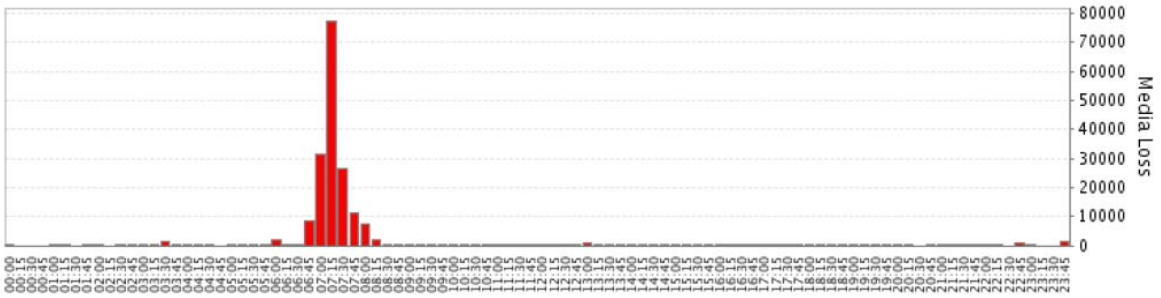
- Media Loss (the number of lost packets in each 15 minute period)
- Media Loss Secs (The number of seconds in each 15 minute period during which lost packets are occurring)
- Outage events (Instances of complete signal loss in each 15 minute period)
- Signal to Noise Ratio (Average S/N ratio in each 15 minute period)

Exhibit 5 contains the IneoQuest Report for WACP for the 48 hour period 00:00 ET, April 29 to 24:00 ET, April 30, 2013. I discuss below the relevant portions of the report and include copies of selected graphs for the reader's convenience. Exhibit 6 contains the IneoQuest Report for WGTW for the 24 hour period 00:00 ET, May 29 to 24:00 May 29, 2013. The differences in the dates and sampling periods between the two reports are not significant for purposes of my analysis.

The IneoQuest Report shows an extraordinarily high level of packet loss from WACP's signal. The IneoQuest Report depicts signal packet loss in two ways – the number of packets lost in each 15 minute period and the number of seconds of packet loss in each 15 minute period. The report in Exhibit 5 covers 48 hours, providing two sets of graphs covering 24 hours. Here are the Media Loss graphs from pages 3 and 6 of the WACP Report:

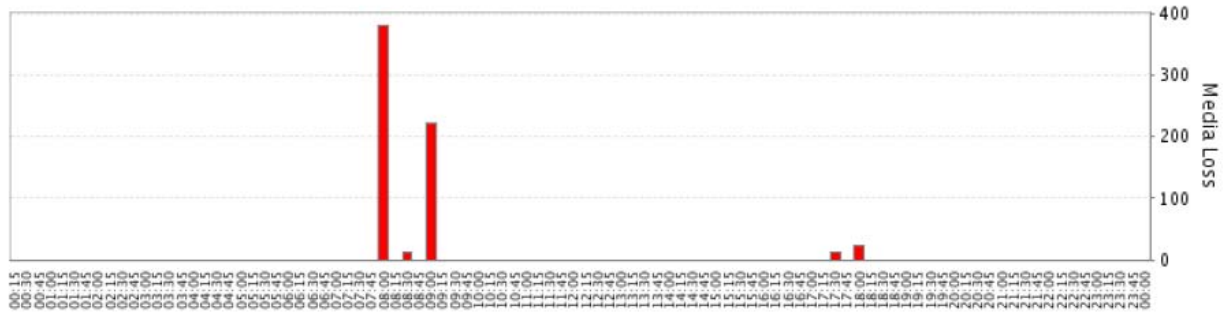


[5] The Reports also display R – S (Reed Solomon) Errors both corrected and uncorrected. I do not consider those graphs relevant to my analysis.



These graphs show extraordinary packet loss for at least 5 of the 48 hours tested. The packet loss per 15 minutes peaks at over 75,000 packets lost on at least three occasions, with packet loss exceeding 10,000 packets for a total of three and a half hours. Total packet loss for 48 hours exceeded 559,000 packets.

Compare WACP packet loss with the following Media Loss graph from page 3 of the WGTW report:

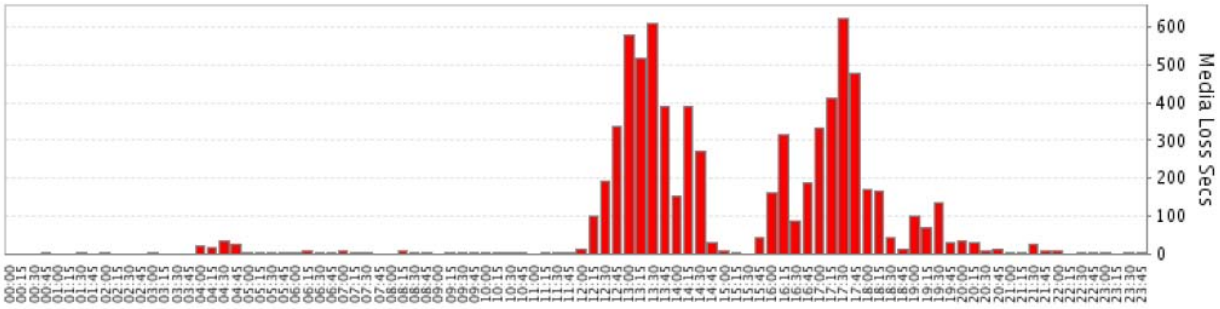


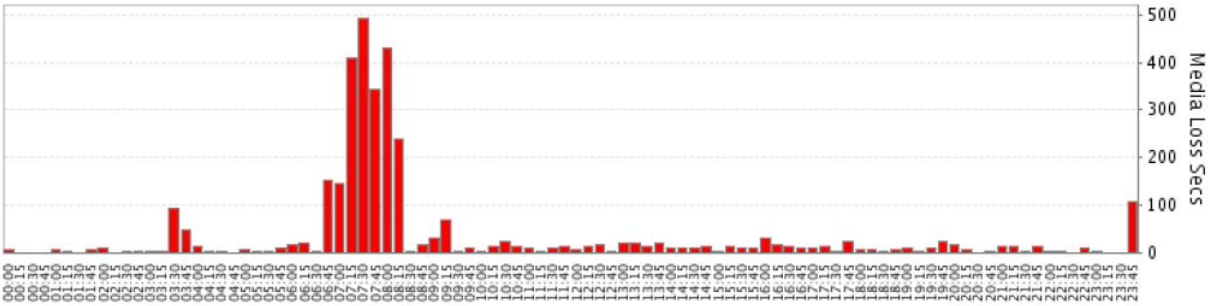
The maximum 15 minute packet loss for WTGW peaked at less than 400 packets lost for a single period during 24 hours. The total 24 hour packet loss for WGTW was approximately 700 packets. By comparison, the total packet loss for WACP for a 48 hour period exceeded 559,000 packets, with a 24 hour average packet loss of nearly 280,000 packets. The 24 hour packet loss rate for WACP was 400 times greater than that for WGTW.

The extraordinarily high packet loss rate shown on the IneoQuest Report helps explain the poor picture quality received at the Oxford headend. In short, due to signal problems, the

station does not deliver the necessary number of digital packets to consistently display complete and clear digital images. The result: distortion, tiling, and periodic complete signal loss.

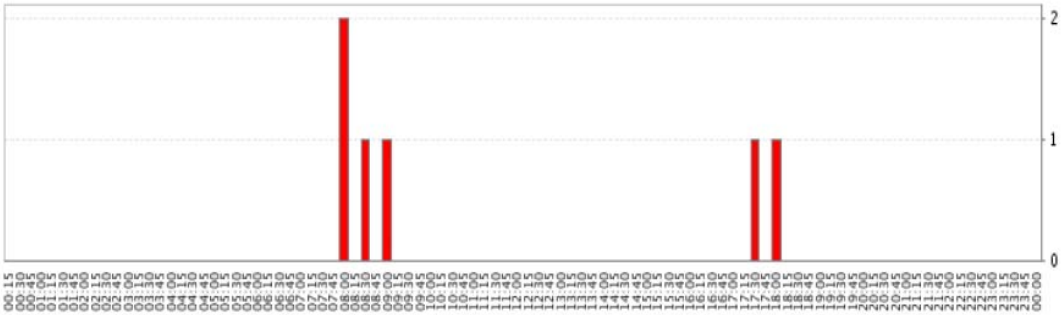
The IneoQuest Media Loss Secs graph displays the same problem with a different measure. Here are the Media Loss Secs graphs from pages 4 and 7 of the WACP Report:





As shown, significant packet loss occurred for approximately <u>11,000 seconds</u> (over 3 hours combined) during the 48 hour period, including multiple 15 minute periods where packet loss occurred during half to two-thirds of the period.

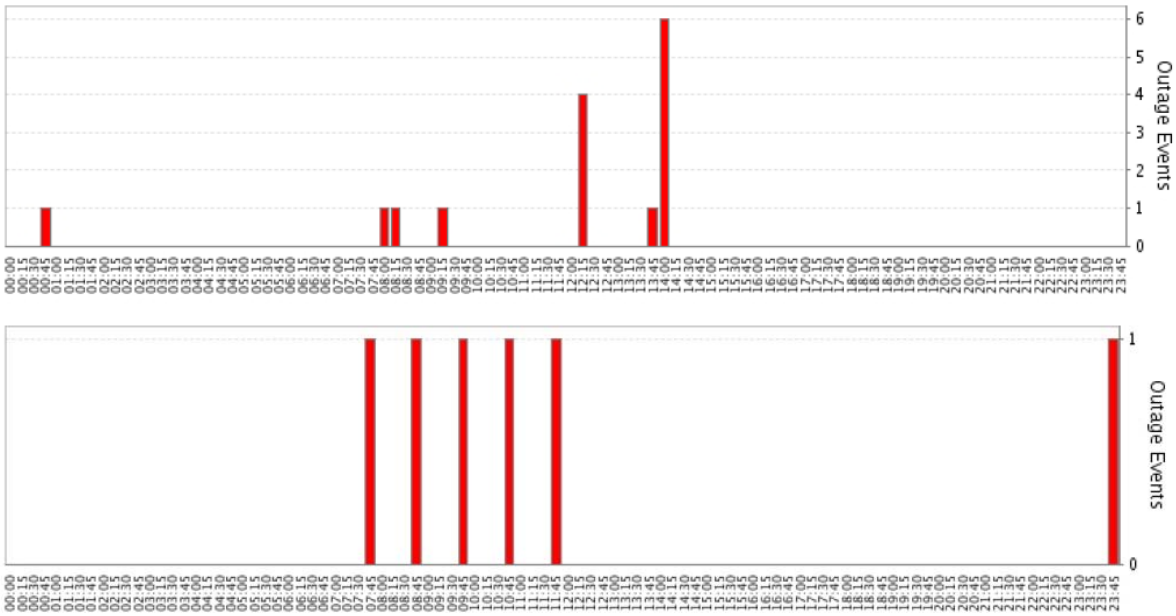
Compare WACP graphs with the following Media Loss Sec graph from page 4 of the WGTW report:



The WGTW report shows packet losses occurred during a total of 5 seconds during the 24 hour period. By comparison, the packet loss/seconds for WACP is 2200 times higher. Again the extraordinary frequency of packet loss shown on the IneoQuest report helps explain the unacceptable picture quality received at the Oxford headend.

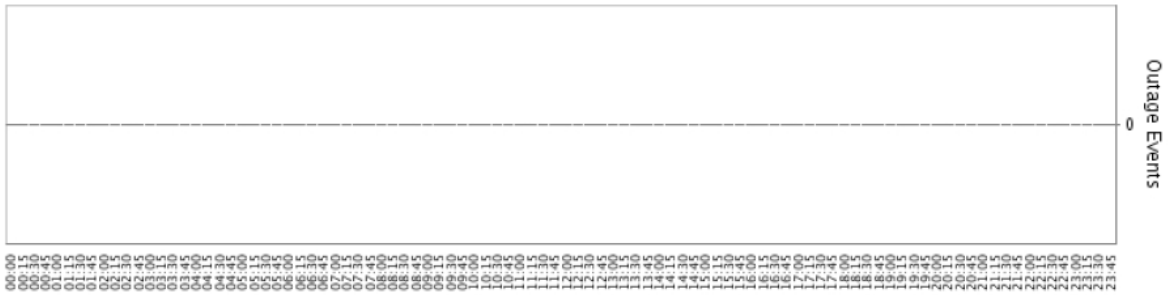
The IneoQuest Report shows multiple complete outages of WACP's signal.

The IneoQuest Report also tracks instances of complete loss of signal, called "Outage Events." Here are the Outage Event graphs from pages 5 and 8 of the WACP IneoQuest Report:



As shown, 21 complete outages occurred during the 48 hour period, an average of over 10 times per day. This would explain the picture freezing and complete loss of audio shown in Exhibit 2 and the complete picture loss shown in Exhibit 4.

By comparison, consider the Outage Event graph from page 5 of the WGTW IneoQuest report. Not a single signal loss occurred in 24 hours.

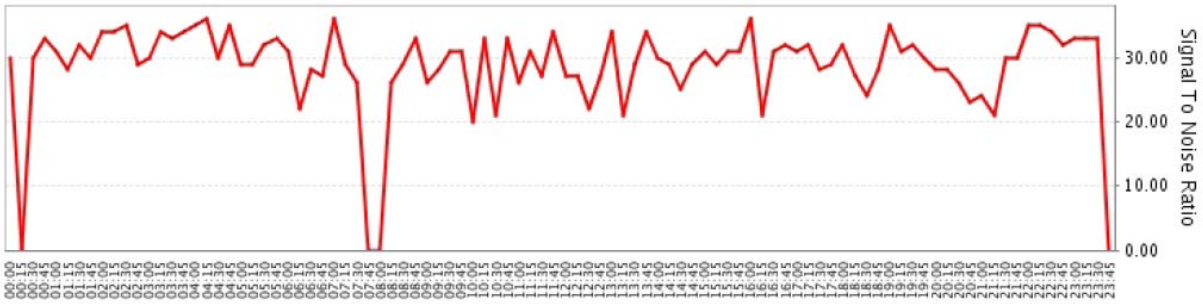


The IneoQuest Report shows the main reason for the unacceptable picture quality – extraordinarily high rate of packet loss.

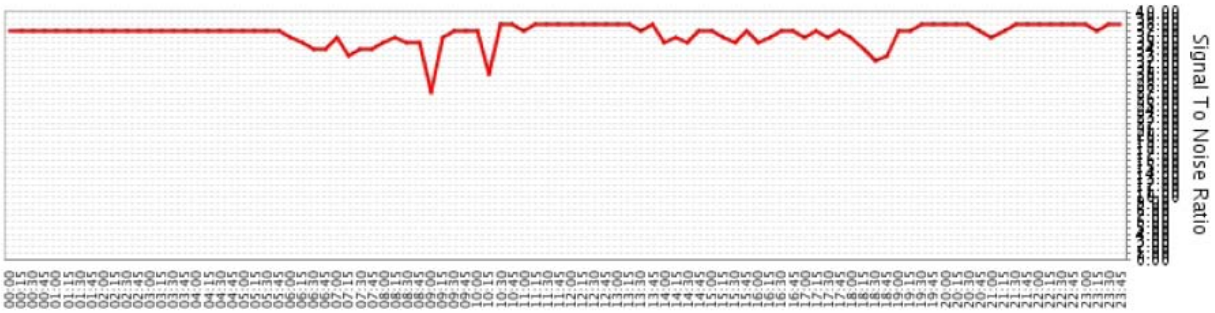
Based on my observations of the picture quality as monitored at the Oxford headend, and based on the data presented in the IneoQuest Report, all conducted after installing the preamp and filter requested by WACP's engineer, I conclude that the signal quality is unacceptable due to the extraordinarily high level of packet loss. Due to distance, terrain, inference, or other reasons, a sufficiently high number of packets in the digital signal are not arriving at the headend, resulting in poor signal quality.

WACP's S/N ratio also reflects a poor quality signal.

Packet loss is the main problem with WACP's signal as the IneoQuest Report shows. It is also important to note the Station's erratic S/N ratio. Here are the S/N Ratio graphs from pages 5 and 8 of the WACP IneoQuest Report:



As shown, the signal frequently suffers from relatively high noise levels, frequently dropping below 25 and periodically dropping to zero. Compare the WACP S/N ratio with that of WGTW as shown on page 5 of the WGTW Report:



The WGTW Report shows a much more stable S/N ratio, averaging in the high 30's with only two dips toward 25 in 24 hours.

The S/N ratio comparison provides additional information to explain why the picture quality is so poor, even after the installation of the preamp and filter.

Conclusion

Due mainly to extraordinarily high packet loss, and to some degree to an erratic and low S/N ratio, WACP is unable to deliver a good quality signal to Armstrong's Oxford headend. From an engineering perspective, the signal is far below the quality I can accept on Armstrong's cable systems.

Certification

I have read this Supplemental Engineering Statement and Declaration and the Supplemental Opposition to which it is attached. I certify that to the best of my knowledge, information and belief formed after reasonable inquiry, both submissions are well grounded in fact, warranted by existing law, and are not interposed for any improper purpose.

Respectfully submitted,

Edgar E. Hassler, Jr.
Vice President of Engineering
Armstrong Utilities, Inc.
June 27, 2013

Exhibit 1
Horizontal Line Distortion

Photo A
Subject: Screenshot of WACP
Location: Armstrong Utilities Oxford, PA headend, 383 Union Square Road, Nottingham, PA.
Date/time: April 29, 2013, between 9 am and 1 pm ET
Taken by: Ed Hassler, Jr., Vice President of Engineering

Exhibit 1 (cont.)
Horizontal Line Distortion

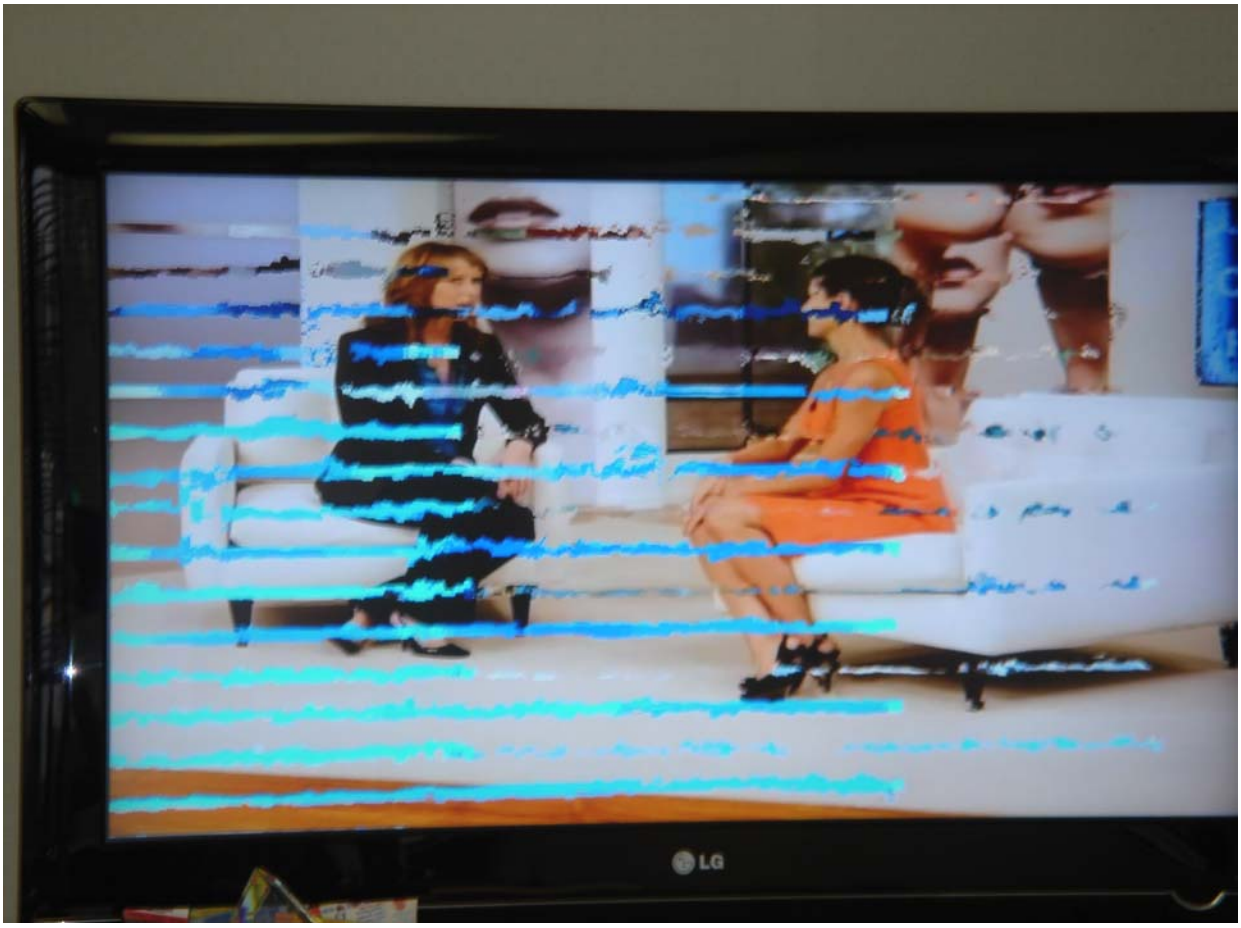


Photo B
Subject: Screenshot of WACP
Location: Armstrong Utilities Oxford, PA headend, 383 Union Square Road, Nottingham, PA.
Date/time: April 29, 2013, between 9 am and 1 pm ET
Taken by: Ed Hassler, Jr., Vice President of Engineering

Exhibit 1 (cont.)
Horizontal Line Distortion

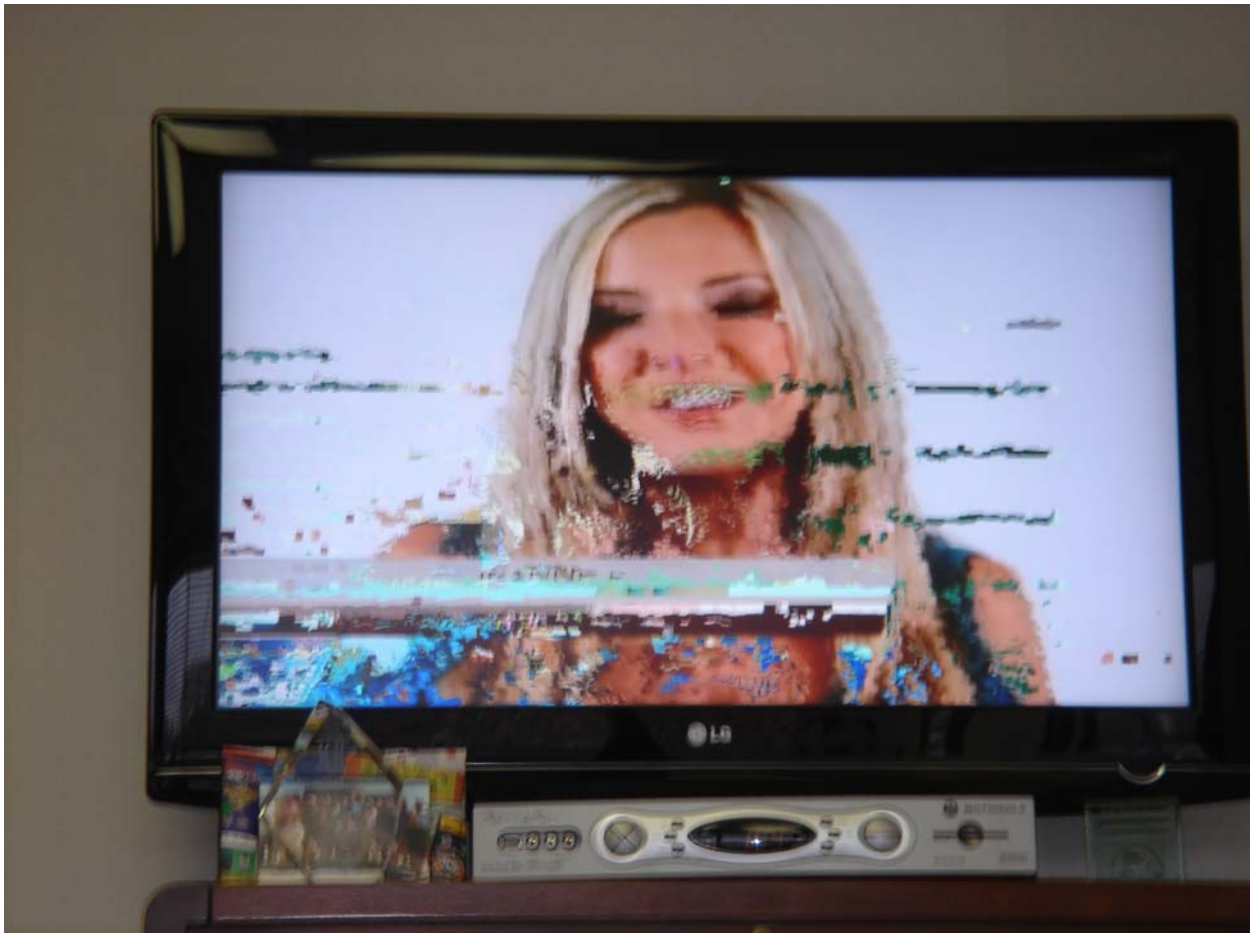


Photo C
Subject: Screenshot of WACP
Location: Armstrong Utilities Oxford, PA headend, 383 Union Square Road, Nottingham, PA.
Date/time: April 29, 2013, between 9 am and 1 pm ET
Taken by: Ed Hassler, Jr., Vice President of Engineering

Exhibit 1 (cont.)
Horizontal Line Distortion

Photo D
Subject: Screenshot of WACP
Location: Armstrong Utilities Oxford, PA headend, 383 Union Square Road, Nottingham, PA.
Date/time: April 29, 2013, between 9 am and 1 pm ET
Taken by: Ed Hassler, Jr., Vice President of Engineering

Exhibit 1 (cont.)
Horizontal Line Distortion

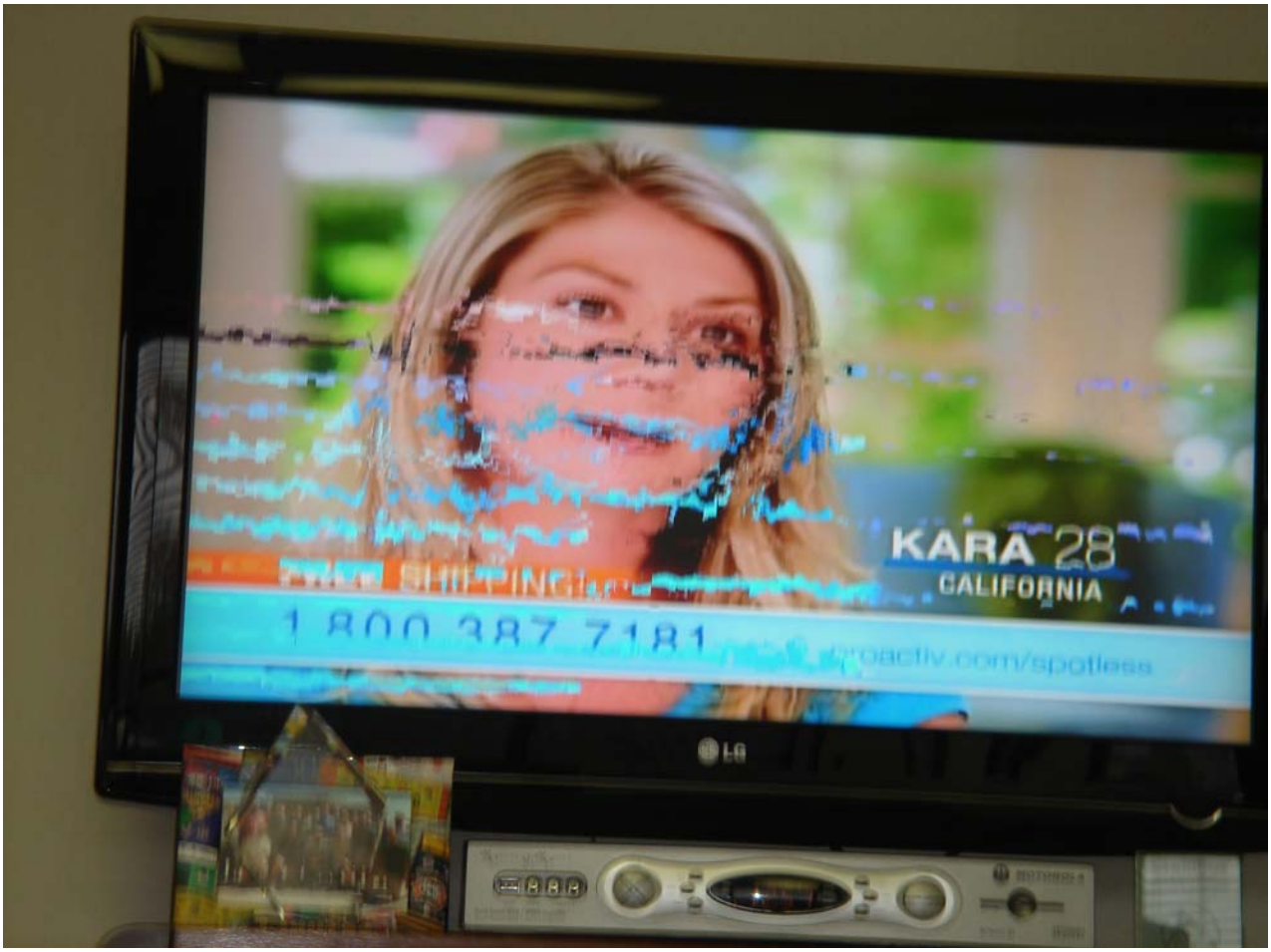


Photo E
Subject: Screenshot of WACP
Location: Armstrong Utilities Oxford, PA headend, 383 Union Square Road, Nottingham, PA.
Date/time: April 29, 2013, between 9 am and 1 pm ET
Taken by: Ed Hassler, Jr., Vice President of Engineering

Exhibit 1 (cont.)
Horizontal Line Distortion

Photo F
Subject: Screenshot of WACP
Location: Armstrong Utilities Oxford, PA headend, 383 Union Square Road, Nottingham, PA.
Date/time: April 29, 2013, between 9 am and 1 pm ET
Taken by: Ed Hassler, Jr., Vice President of Engineering

Exhibit 2
Picture Freezing with Audio Loss

Photo G
Subject: Screenshot of WACP
Location: Armstrong Utilities Oxford, PA headend, 383 Union Square Road, Nottingham, PA.
Date/time: April 29, 2013, between 9 am and 1 pm ET
Taken by: Ed Hassler, Jr., Vice President of Engineering

Exhibit 2 (cont.)
Picture Freezing with Audio Loss

Photo H
Subject: Screenshot of WACP
Location: Armstrong Utilities Oxford, PA headend, 383 Union Square Road, Nottingham, PA.
Date/time: April 29, 2013, between 9 am and 1 pm ET
Taken by: Ed Hassler, Jr., Vice President of Engineering

Exhibit 3
Tiling

Photo I
Subject: Screenshot of WACP
Location: Armstrong Utilities Oxford, PA headend, 383 Union Square Road, Nottingham, PA.
Date/time: April 29, 2013, between 9 am and 1 pm ET
Taken by: Ed Hassler, Jr., Vice President of Engineering

Exhibit 3 (cont.)
Tiling

Photo J
Subject: Screenshot of WACP
Location: Armstrong Utilities Oxford, PA headend, 383 Union Square Road, Nottingham, PA.
Date/time: April 29, 2013, between 9 am and 1 pm ET
Taken by: Ed Hassler, Jr., Vice President of Engineering

Exhibit 4

Complete Picture Loss

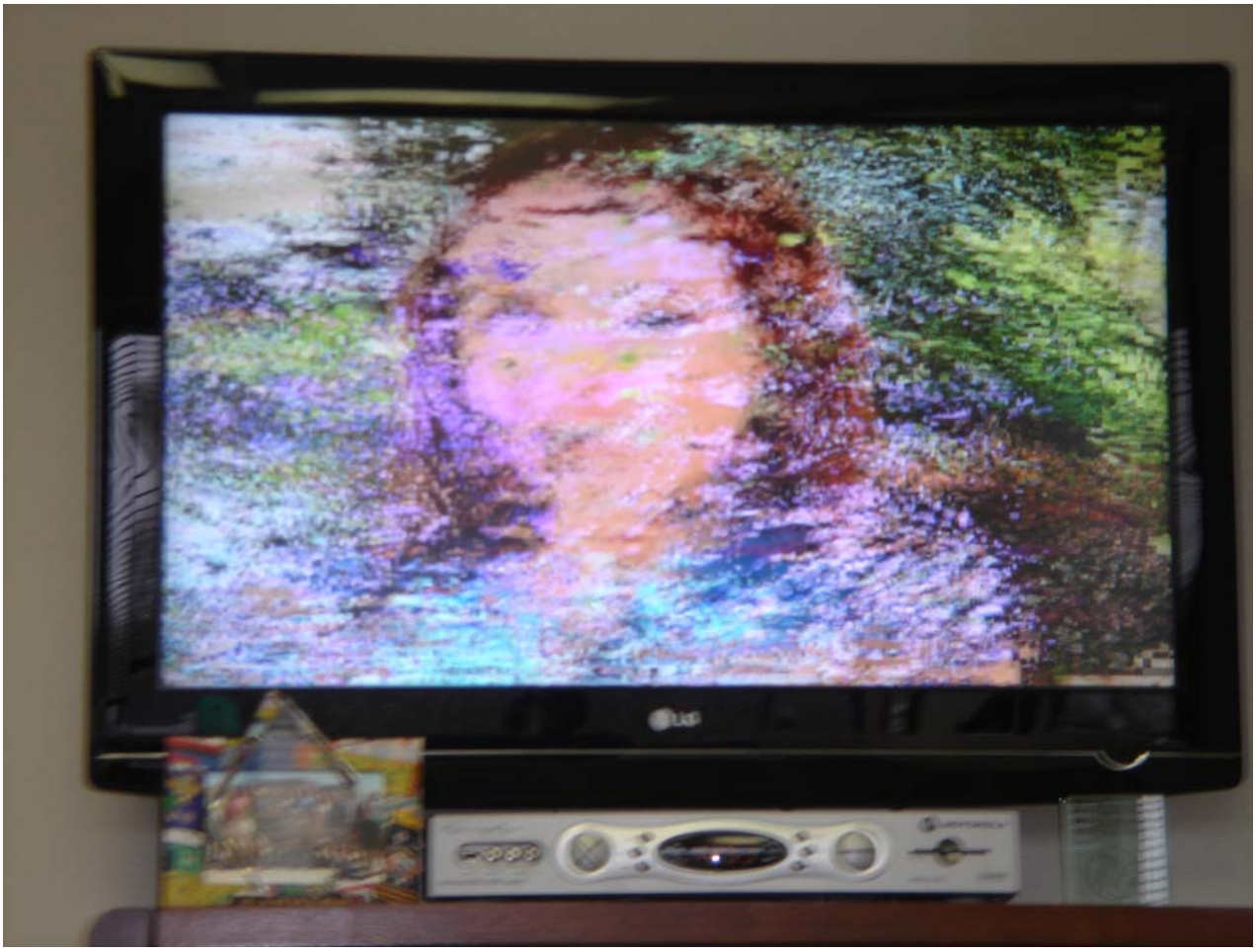


Photo K
Subject: Screenshot of WACP
Location: Armstrong Utilities Oxford, PA headend, 383 Union Square Road, Nottingham, PA.
Date/time: April 29, 2013, between 9 am and 1 pm ET
Taken by: Ed Hassler, Jr., Vice President of Engineering

Exhibit 5
WACP IneoQuest Report for April 29 and 30, 2013

DAILY REPORT

Providing a Health Watch of your IPTV Network

User Name: root

Single Stream Daily Report

Date Generated : May 09, 2013

IneoQuest Technologies, Inc.
The IPTV/IP Video Measurement Leader

www.ineoquest.com

Overview

This report covers the following Monitors for the time period

- Rising Sun VSB, Port: 1

Report Time Period : 2013 April 29 00:00:00 America/Detroit to 2013 April 30 24:00:00 America/Detroit

Stream Address : Ch-4 : [000.000.000.004]_[00000]_[000.000.000.004]_[00000] : 0

Single Stream Detail Report: Rising Sun VSB, Port: 1

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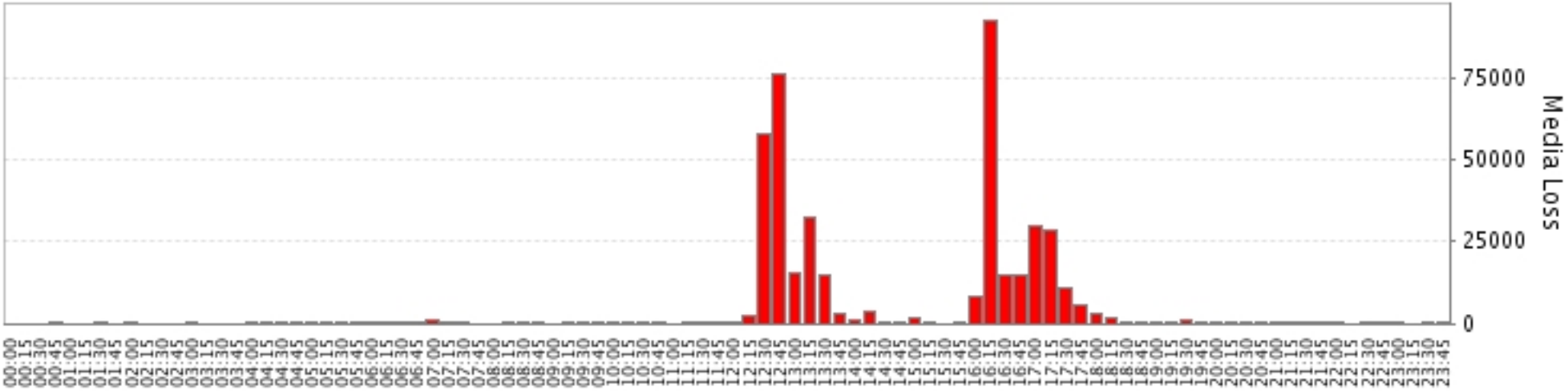

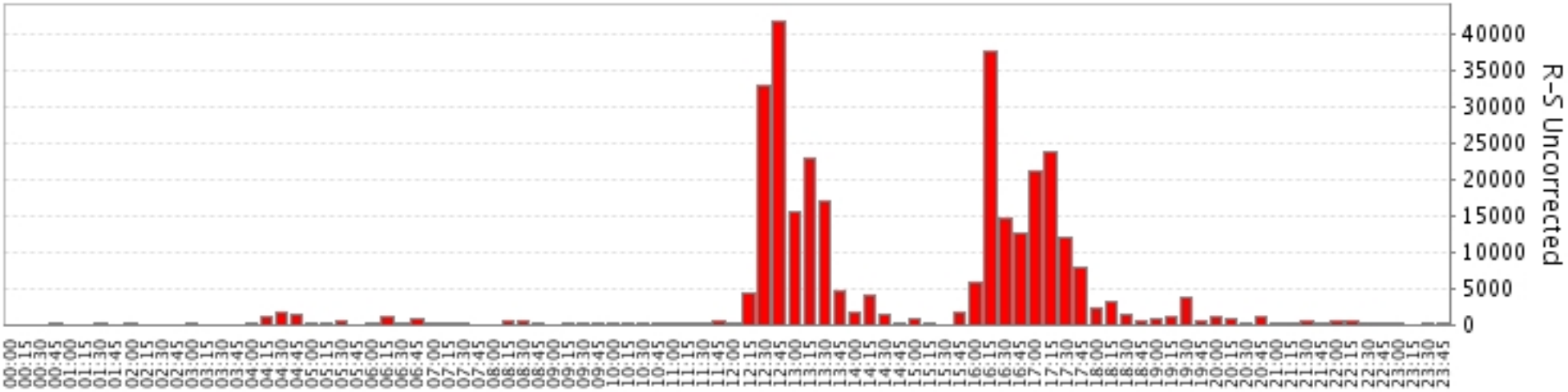

Single Stream Detail Report: Rising Sun VSB, Port: 1

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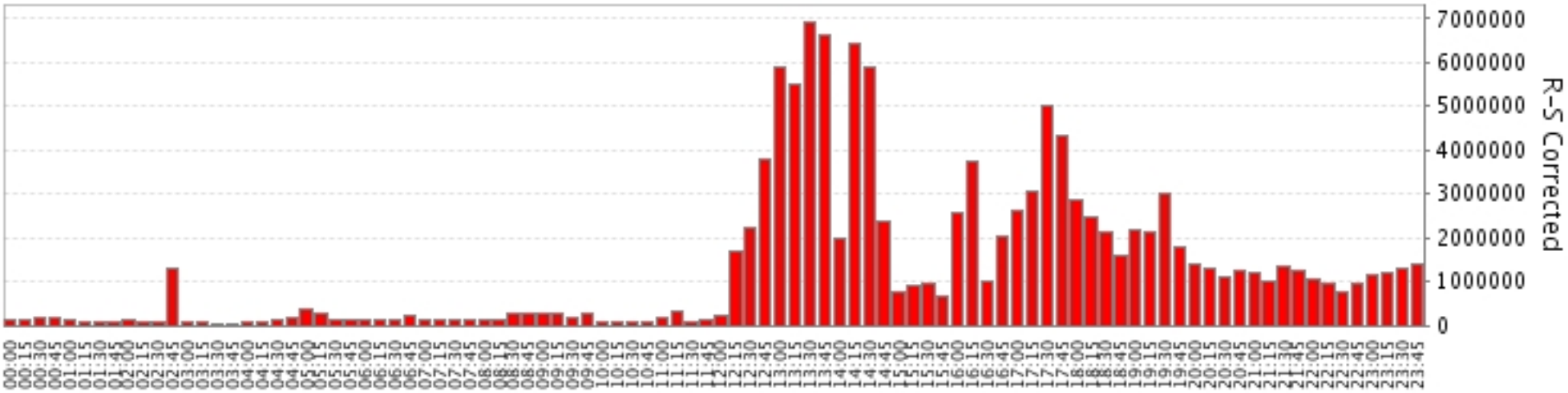

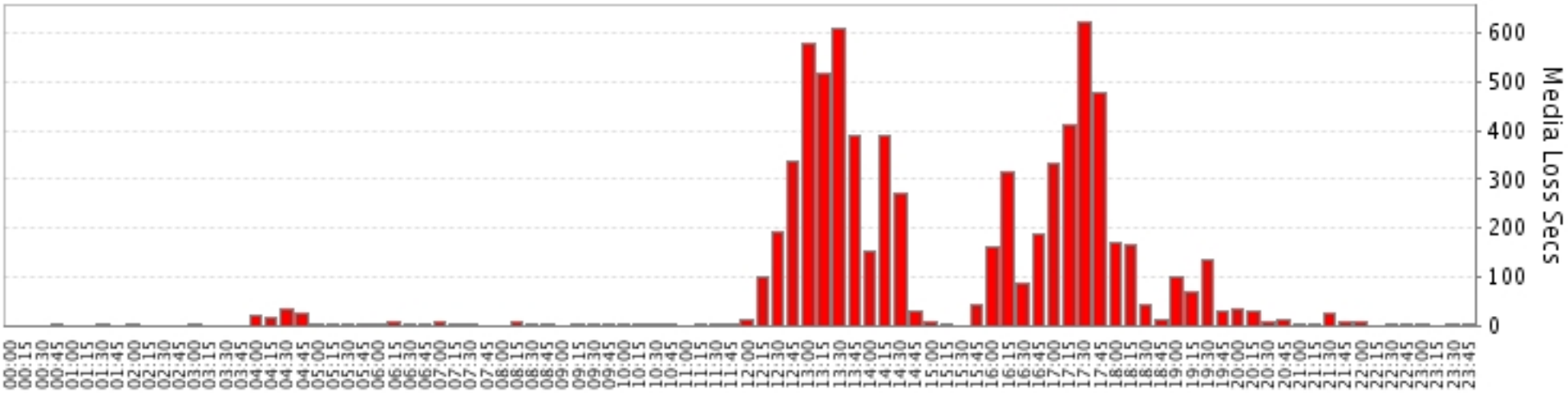

Single Stream Detail Report: Rising Sun VSB, Port: 1

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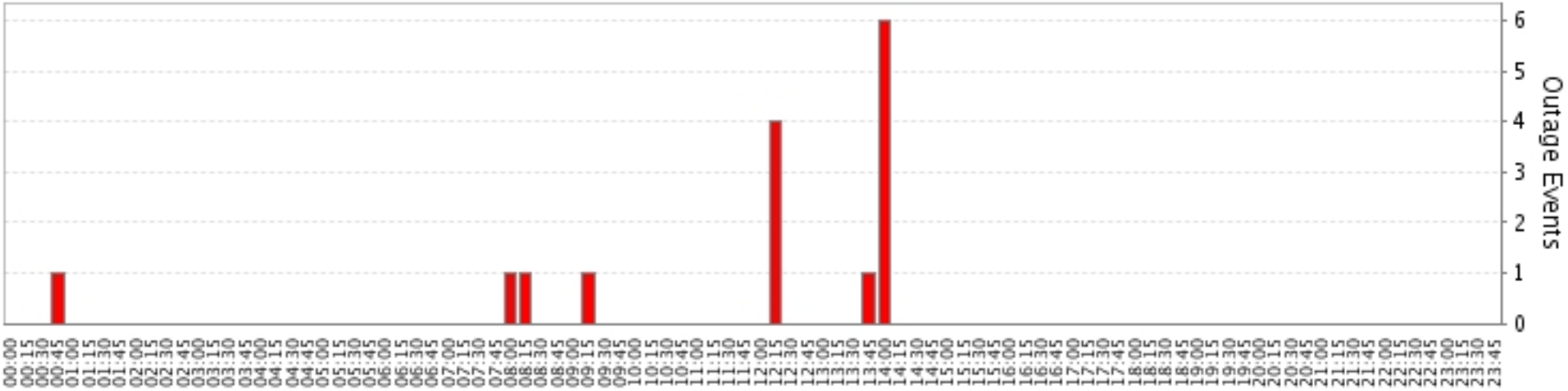

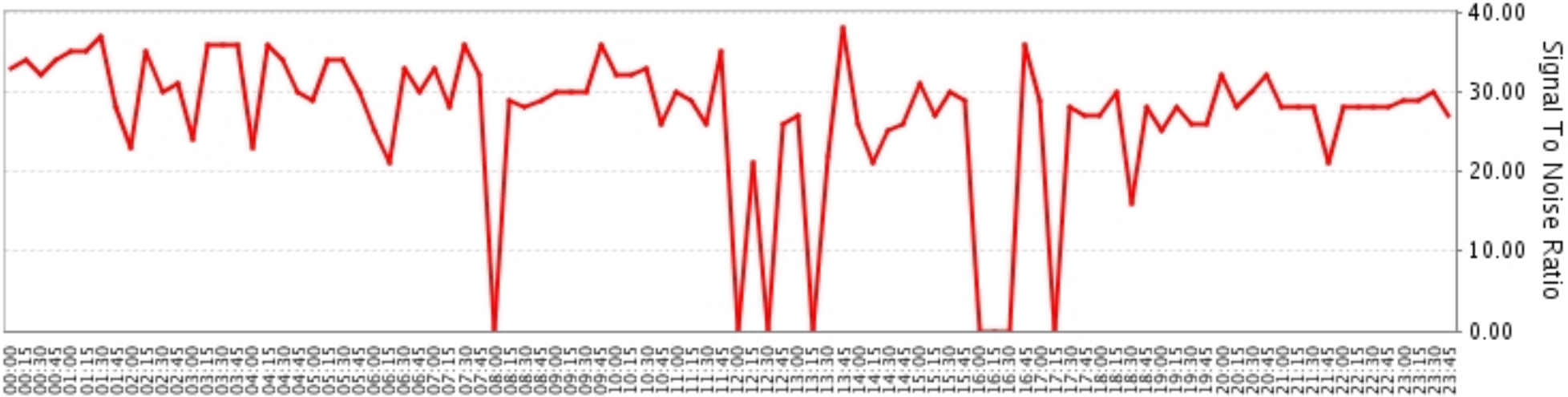

Single Stream Detail Report: Rising Sun VSB, Port: 1

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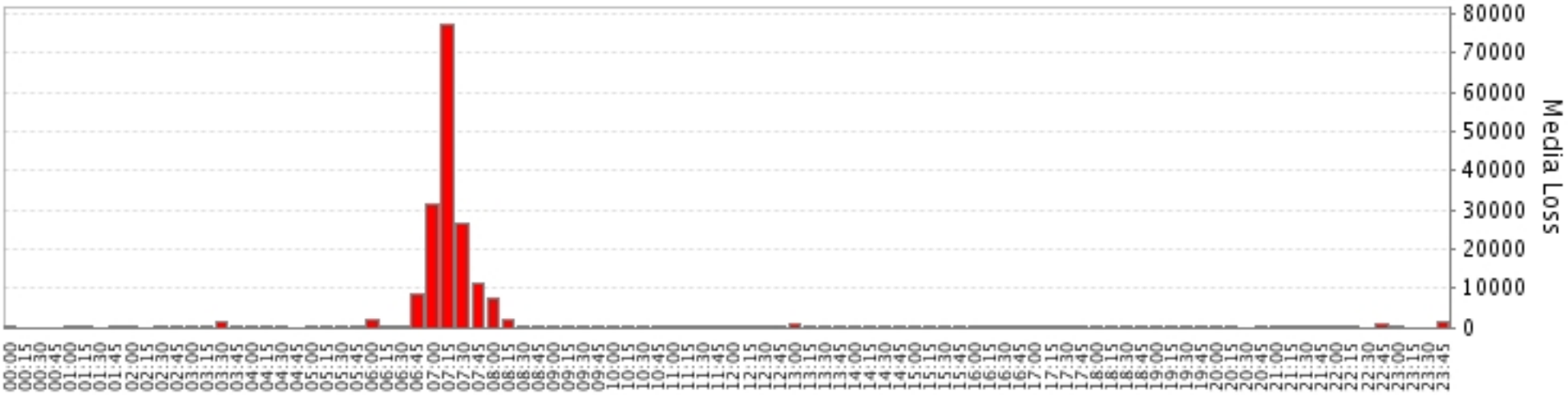

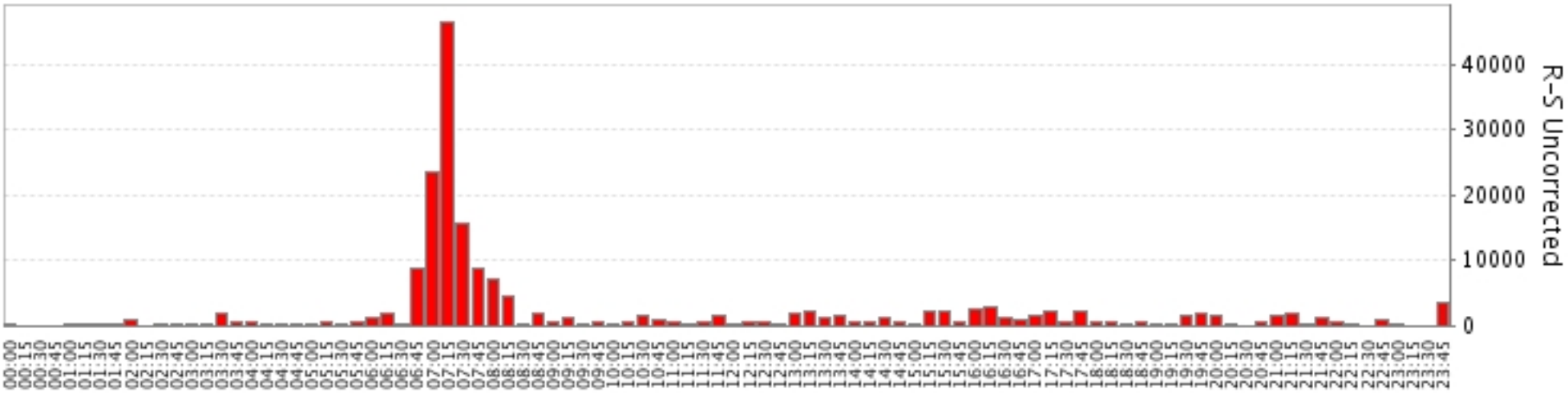

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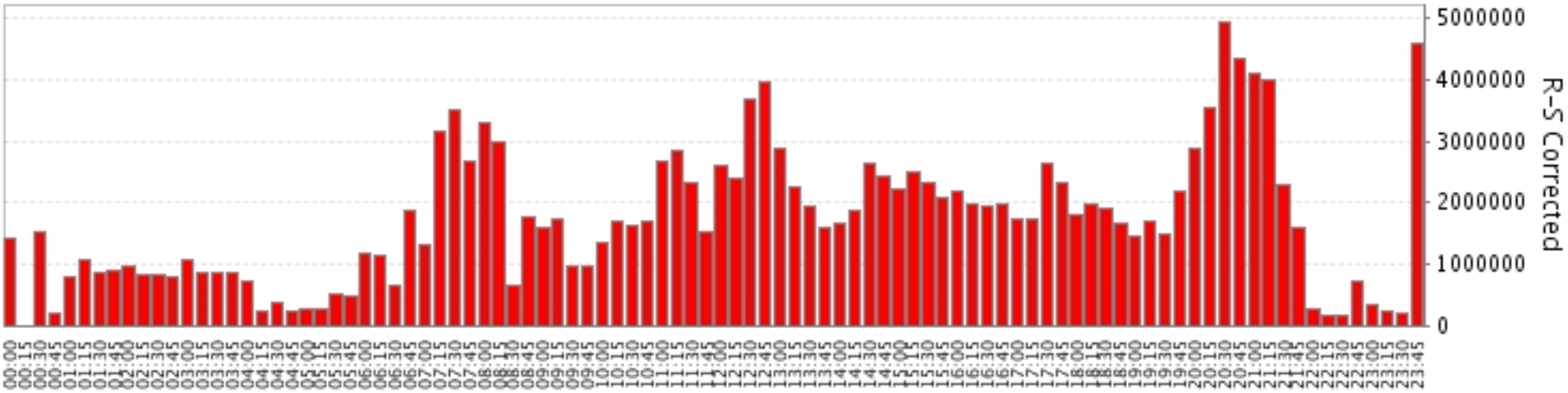

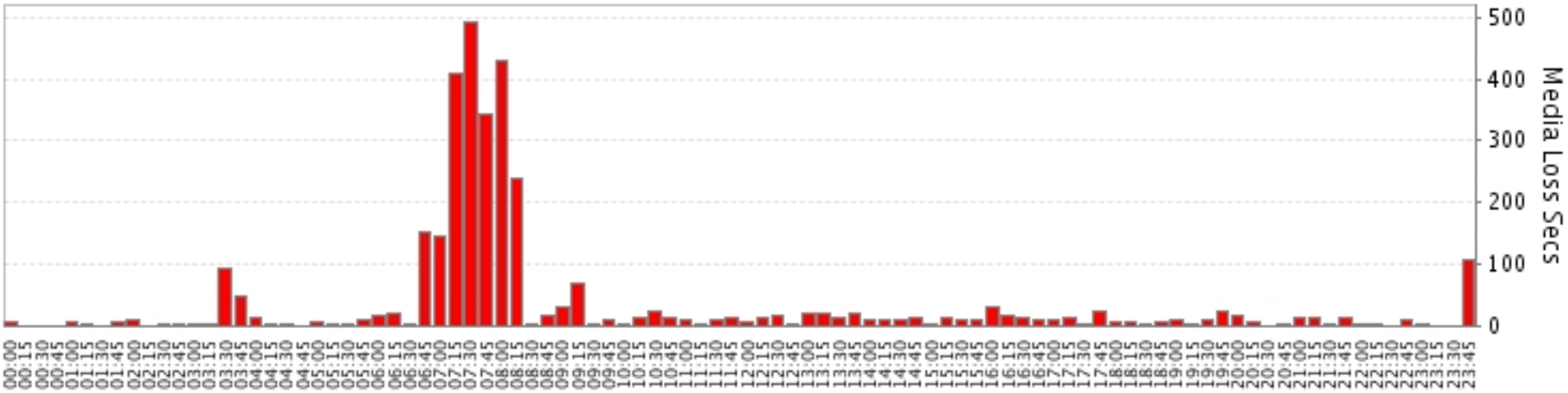

Single Stream Detail Report: Rising Sun VSB, Port: 1

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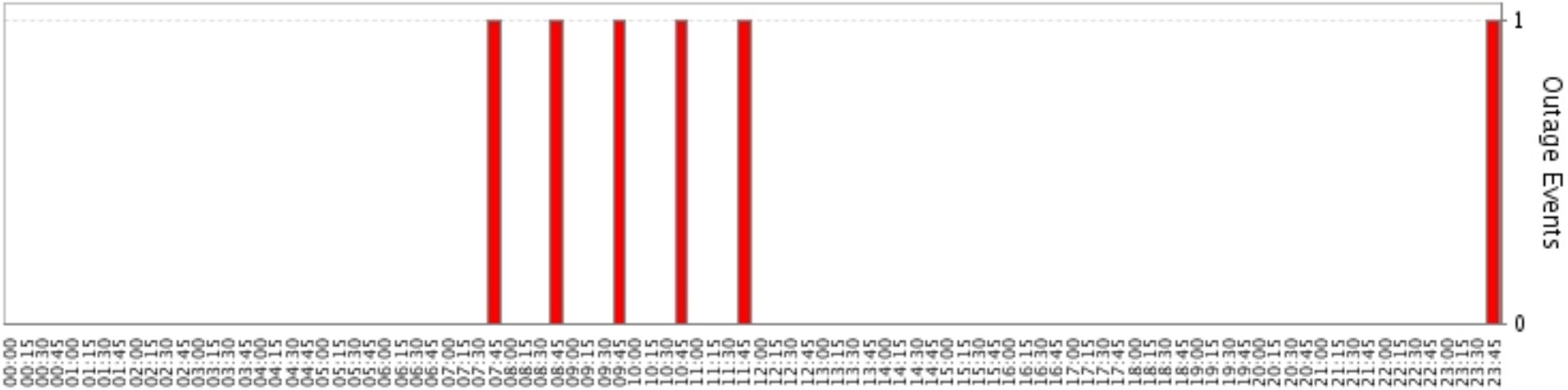

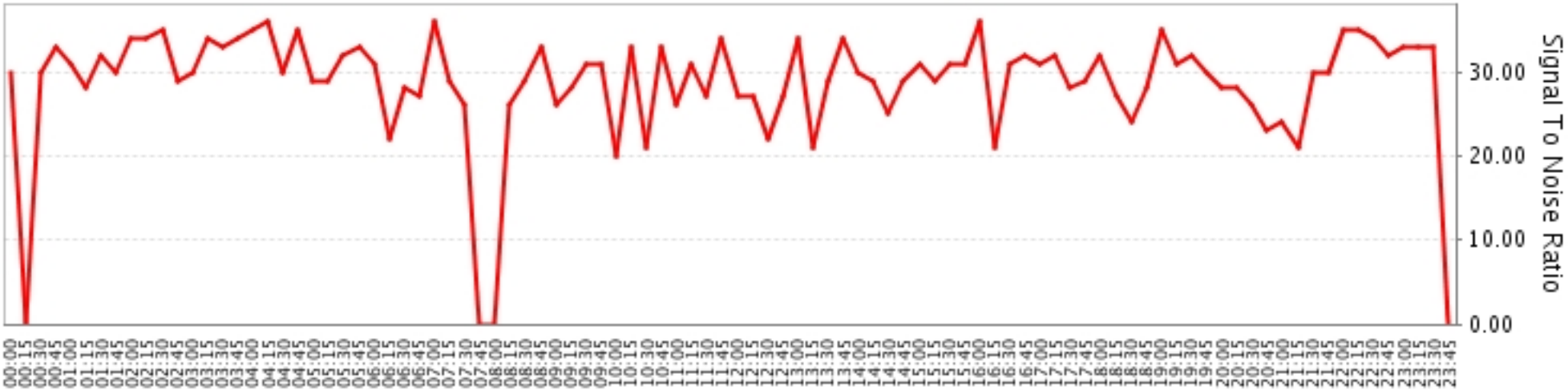

DAILY REPORT

Providing a Health Watch of your IPTV Network

CORPORATE HEADQUARTERS
IneoQuest Technologies, Inc.
170 Forbes Boulevard
Mansfield, MA 02048
USA

TEL: (508) 339-2497
FAX: (508) 339-4727
sales@ineoquest.com

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TEL: (866) 464-4636
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Exhibit 6
WGTW IneoQuest Report for May 29, 2013

DAILY REPORT

Providing a Health Watch of your IPTV Network

User Name: root

Single Stream Daily Report

Date Generated : May 31, 2013

IneoQuest Technologies, Inc.
The IPTV/IP Video Measurement Leader

www.ineoquest.com

Overview

This report covers the following Monitors for the time period

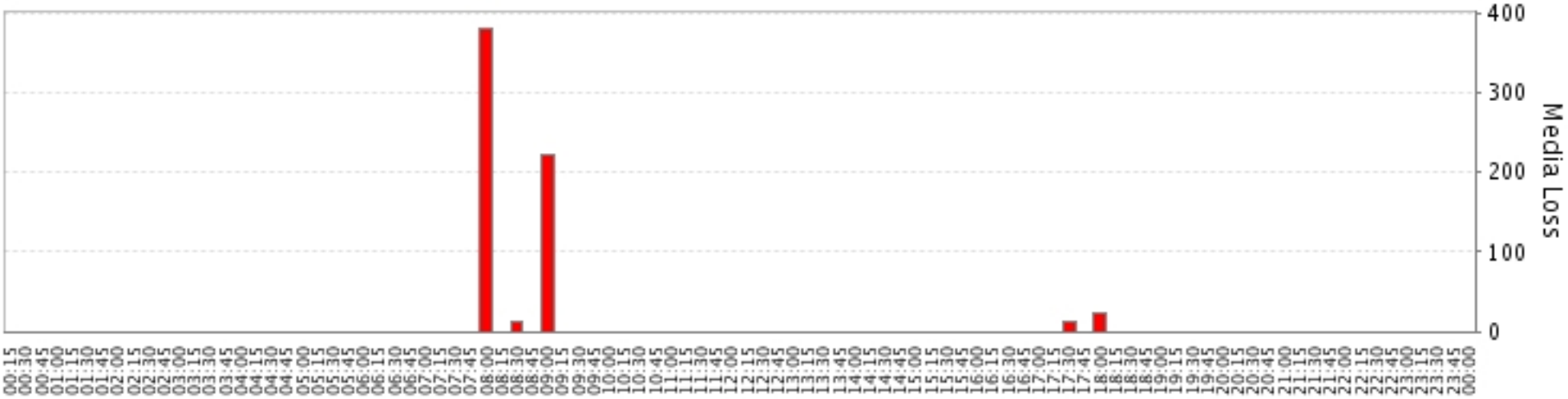
- Rising Sun VSB_2, Port: 1

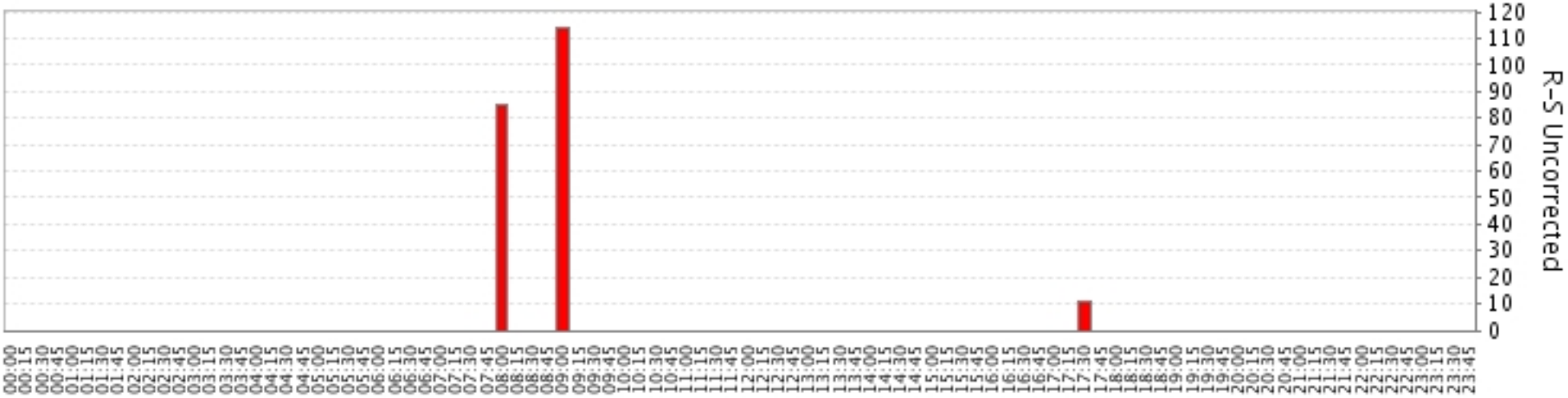
Report Time Period : 2013 May 29 00:00:00 America/Detroit to 2013 May 29 24:00:00 America/Detroit

Stream Address : RF 27 : [000.000.000.027]_[00000]_[000.000.000.027]_[00000] : 0

Single Stream Detail Report: Rising Sun VSB_2, Port: 1

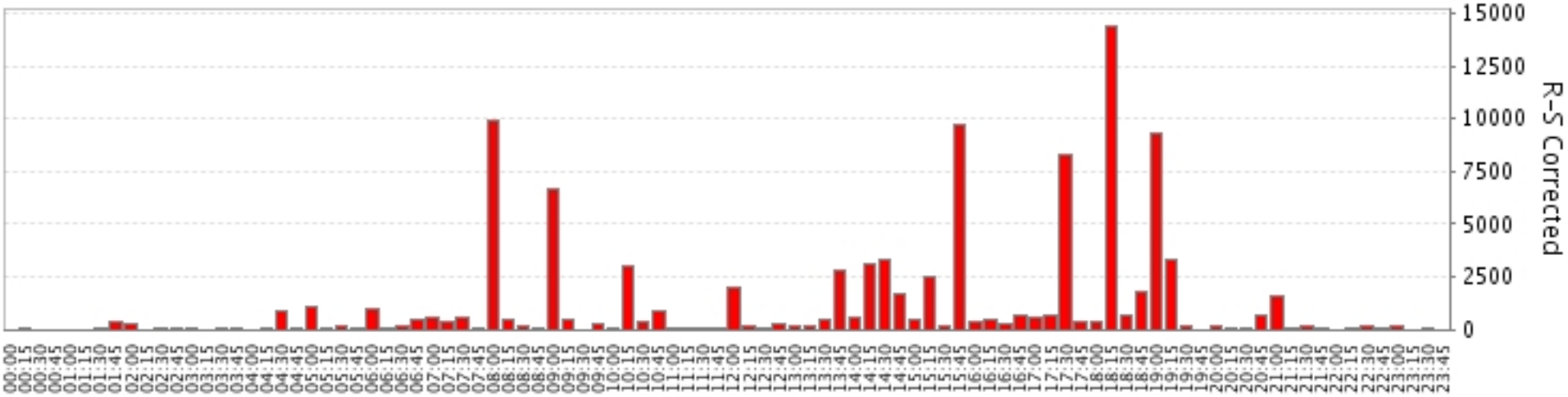
[000.000.000.027]_[00000]_[000.000.000.027]_[00000] : 0 - 2013 May 29

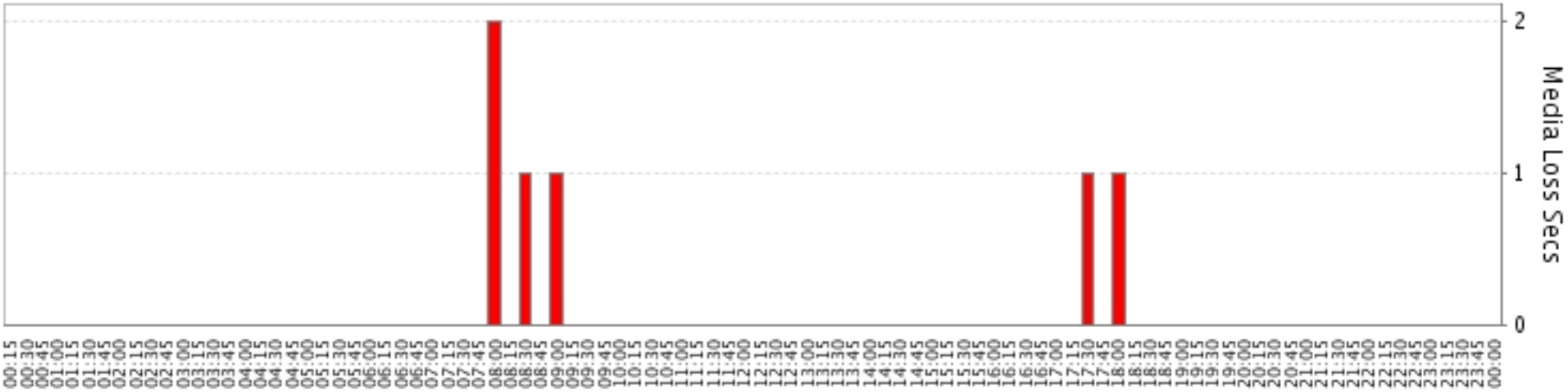




Single Stream Detail Report: Rising Sun VSB_2, Port: 1

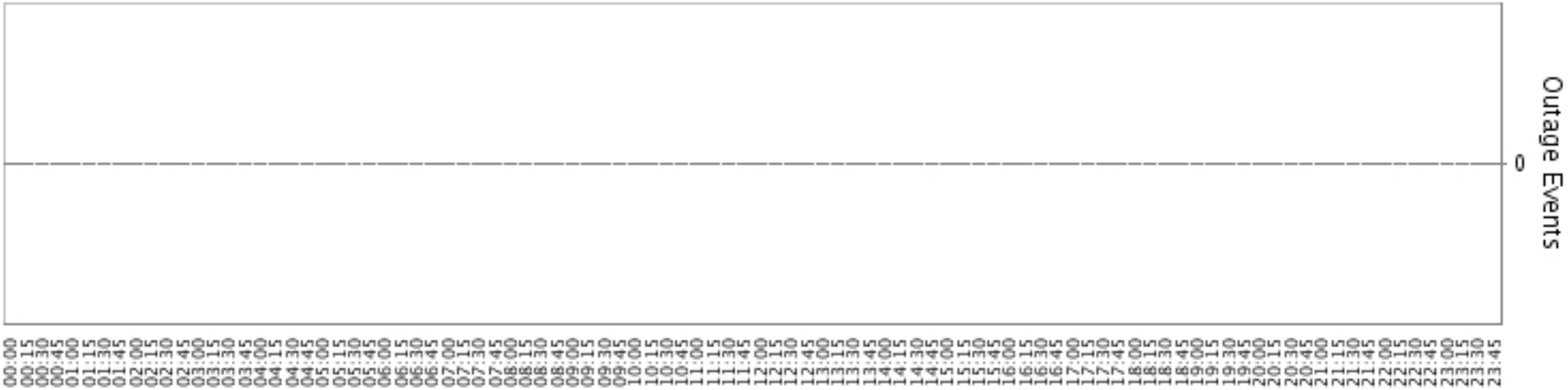
[000.000.000.027]_[00000]_[000.000.000.027]_[00000] : 0 - 2013 May 29

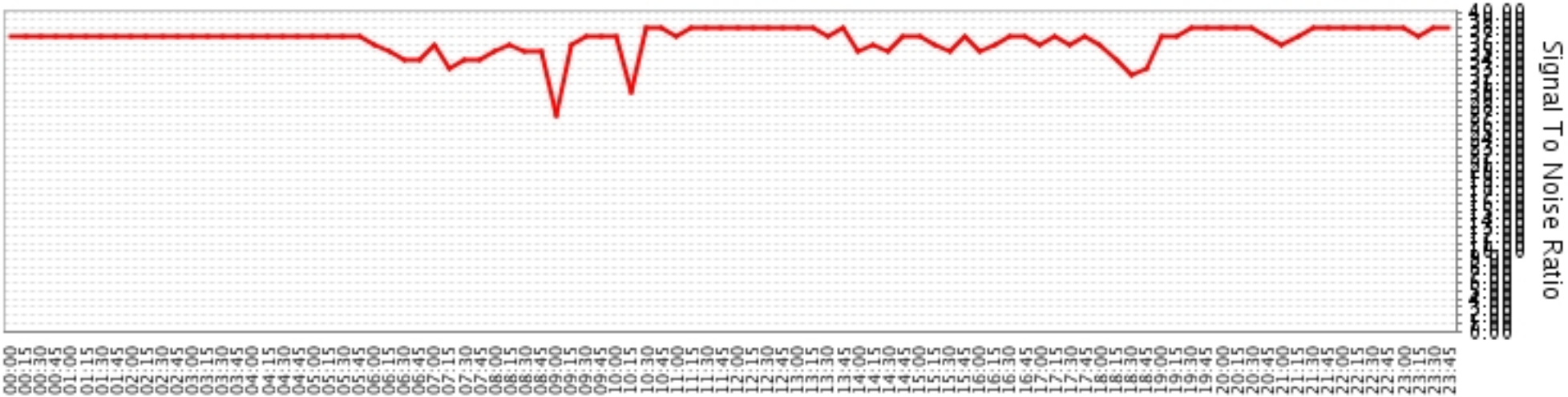




Single Stream Detail Report: Rising Sun VSB_2, Port: 1

[000.000.000.027]_[00000]_[000.000.000.027]_[00000] : 0 - 2013 May 29





DAILY REPORT

Providing a Health Watch of your IPTV Network

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techsupport@ineoquest.com

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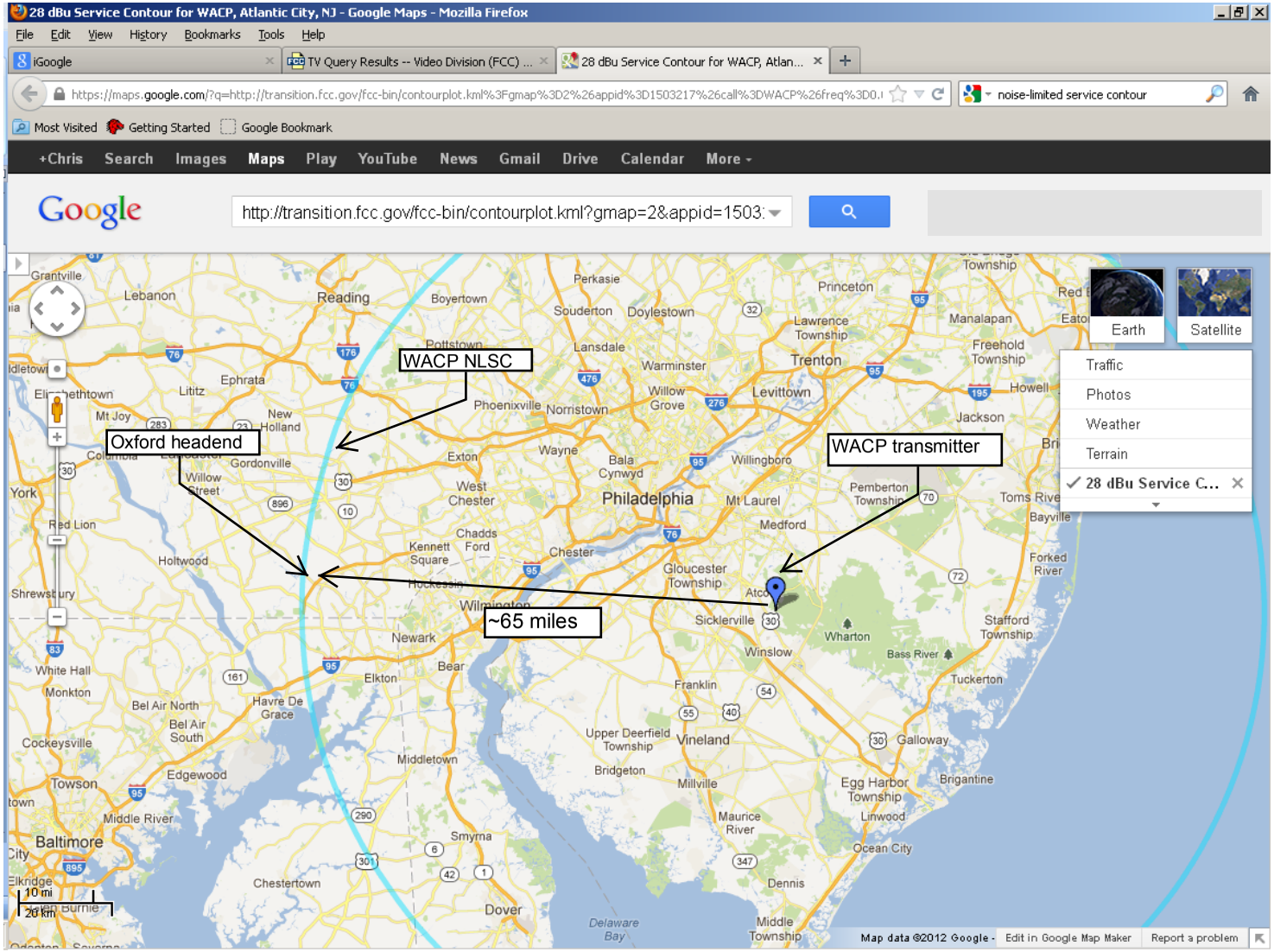
EXHIBIT 2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File Edit View History Bookmarks Tools Help
iGoogle
TV Query Results -- Video Division (FCC) ...
28 dBu Service Contour for WACP, Atlan...
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noise-limited service contour
Most Visited
Getting Started
Google Bookmark
+Chris Search Images Maps Play YouTube News Gmail Drive Calendar More
Google
http://transition.fcc.gov/fcc-bin/contourplot.kml?gmap=2&appid=1503
WACP NLSC
Oxford headend
WACP transmitter
~65 miles
Earth
Satellite
Traffic
Photos
Weather
Terrain
28 dBu Service C...
Philadelphia
Trenton
Reading
Baltimore
Wilmington
Atlantic City
Map data ©2012 Google
Edit in Google Map Maker
Report a problem

EXHIBIT 3

Fletcher, Heald & Hildreth

1300 NORTH 17th STREET, 11th FLOOR
ARLINGTON, VIRGINIA 22209

OFFICE: (703) 812-0400
FAX: (703) 812-0486
www.fhhlaw.com
www.commlawblog.com

M. SCOTT JOHNSON
(703) 812-0474
SJOHNSON@FHHLAW.COM

THOMAS J. DOUGHERTY, JR.
(703) 812-0409
DOUGHERTY@FHHLAW.COM

June 6, 2012

Via Certified Mail, Return Receipt Requested

Mr. Dave Wittmann
Armstrong Utilities Inc.
One Armstrong Place
Butler, Pennsylvania 16001

Re: Mandatory Carriage Election for WACP, Atlantic City, NJ

Dear Mr. Whittmann:

Pursuant to Section 614 of the Communications Act of 1934, as amended, and Section 76.64(f)(4) of the rules of the Federal Communications Commission, this will inform you that Western Pacific Broadcast, LLC, the licensee of Television Station WACP, Atlantic City, NJ (the "Station") hereby elects mandatory carriage of the Station's television signal pursuant to Section 76.56(b) on all cable systems operated by any one or more of Armstrong Utilities Inc. or any one or more of its direct or indirect subsidiaries or affiliates to the extent they serve the Philadelphia, PA Designated Market Area ("DMA), including without limitation those community units listed on Exhibit A hereto. Carriage is sought solely within the DMA. The Station is a new station that is licensed to Atlantic City, NJ, which is part of the DMA. The Station is scheduled to begin commercial broadcasting on June 8, 2012. The Station will present the programming of Cannella Response Television, LLC, as well as other offerings of high quality programming. With reference to FCC Rule 76.56(b)(5), the Station will not substantially duplicate the signal of any other local commercial television station that is carried or retransmitted on your systems within the DMA and will not have a network affiliation duplicating that of a local commercial television station carried on your systems within the DMA.

The Station is assigned virtual channel 4 and elects carriage on that channel as of right under FCC Rule 76.57. Please be advised for purposes of complying with the FCC's material degradation requirement that the station will commence broadcast with one program stream employing virtually the entire bit stream (19.4 mbps) of the channel.

The Station is a local commercial television station as to all cable systems operating in the DMA, as defined in FCC Rule 76.55(c). For purposes of that definition, please be advised that in the event that the Station does not deliver an over the air signal of good quality as specified in FCC Rule 76.55 (c)(3) to the principal headend(s) [as defined in FCC Rule 76.5(pp)] of the cable systems covered by this election, the Station will be responsible for providing equipment and bearing the costs of delivering such requisite signal of good quality to those headend(s) as required to comply with FCC Rule 76.55 (c), including without limiting the foregoing, the costs for any needed specialized equipment. Please note that this correspondence is not a demand for carriage; rather it is the election notice new stations are required to make under FCC Rule 76.64(f)(4).

Official correspondence in connection with this letter should be directed to the undersigned at the Fletcher, Heald & Hildreth, PLC address on this letterhead as the Station's contact person, with a copy to Mr. Bray at the address below.

Please contact the undersigned if you should have any questions concerning this matter.

Sincerely,

M. Scott Johnson
Thomas J. Dougherty, Jr.
Counsel for and Acting on Behalf of
Western Pacific Broadcast, LLC

cc: Matthew J. Bray, Vice President
Western Pacific Broadcast, LLC
400 N. Ashley Dr. Suite 3010
Tampa, FL 33602

{00406376-1}

EXHIBIT 4

Fletcher, Heald & Hildreth

1300 NORTH 17th STREET, 11th FLOOR
ARLINGTON, VIRGINIA 22209

OFFICE: (703) 812-0400
FAX: (703) 812-0486
www.fhhlaw.com
www.commlawblog.com

M. SCOTT JOHNSON
(703) 812-0474
SJOHNSON@FHHLAW.COM

THOMAS J. DOUGHERTY, JR.
(703) 812-0409
DOUGHERTY@FHHLAW.COM

September 14, 2012

Via Certified Mail, Return Receipt Requested

Mr. Dave Wittmann
Armstrong Utilities Inc.
One Armstrong Place
Butler, Pennsylvania 16001

Re: Mandatory Carriage Election for WACP, Atlantic City, NJ

Dear Mr. Whittmann:

This letter is being delivered to you on behalf of Western Pacific Broadcast, LLC, the licensee of local commercial Television station WACP, licensed on channel 4 to serve the community of Atlantic City, NJ. This letter is a demand for carriage under FCC Rule 76.61(a)(1).

By letter dated June 6, 2012, and received by your office on June 8,[1] you were informed that WACP was commencing operation as a local commercial television station in the Philadelphia, PA Designated Market Area (the "DMA") and had elected mandatory carriage status.[2] As stated in that letter, as a cable operator within the DMA, FCC Rule 76.64(f)(4) required you to commence carriage of WACP by the date that is 90 days after that election. That 90 day period has ended, and our investigation has revealed that your system(s) within the DMA is not carrying WACP. This failure to commence continuous carriage within that 90 day period is a violation of FCC Rules, as well as the Communications Act of 1934, as amended. Although you received our carriage election notice, we have not received any communication from you indicating that you have a valid defense to carriage.

To be clear, WACP is entitled to carriage on your cable system(s) within the DMA. WACP has properly elected must carry status, and is a commercial television station which is local to the DMA.

Under FCC Rule 76.61(a)(2), you are required to respond to this letter in writing within 30 days of your receipt of this letter, and to either commence to carry the WACP signal in accordance with the terms requested in the attached carriage election letter or to state your reasons (if any) for believing that you are not obligated to carry the WACP signal.

---

1 See U.S. Postal Service return receipt notification and Track & Confirm attached to this letter.
2 A copy of that letter is attached.

It is our hope that carriage of the WACP signal on your cable system(s) within the DMA will commence promptly, and that this dispute will end with that carriage.

Official correspondence in connection with this letter should be directed to the undersigned at the Fletcher, Heald & Hildreth, PLC address on this letterhead as the Station's contact person, with a copy to Mr. Bray at the address below.

Please contact the undersigned if you should have any questions concerning this matter.

Sincerely,

M. Scott Johnson
Thomas J. Dougherty, Jr.
Counsel for and Acting on Behalf of
Western Pacific Broadcast, LLC

cc: Matthew J. Bray, Vice President
Western Pacific Broadcast, LLC
400 N. Ashley Dr. Suite 3010
Tampa, FL 33602

{00438269-1}

EXHIBIT 5

Chris Cinnamon

From: Christopher Cinnamon [cccinnamon@cm-chi.com]
Sent: Friday, September 21, 2012 10:58 AM
To: 'sjohnson@fhhlaw.com'
Cc: 'dougherty@fhhlaw.com'
Subject: Armstrong Utilities/WACP

Importance: High

Dear Mr. Johnson:

On behalf of Armstrong, we acknowledge receipt of your September 14 letter.

As a preliminary matter, we note the September 14 letter materially misstates the contents of your June 6, 2012 letter to Armstrong, and makes baseless allegations that Armstrong has violated FCC regulations. To be clear, Armstrong observes its compliance obligations with scrupulous care, and denies all alleged violations in your letter.

Concerning the must carry demand of WACP, Armstrong is in the process of evaluating that demand, and we will respond as soon as practicable after that evaluation is complete.

Please direct any further communication on this matter to me.

As this is our first email communication, I would appreciate a reply to confirm receipt.

Regards,

Chris Cinnamon
Cinnamon Mueller
307 North Michigan Ave.
Suite 1020
Chicago, IL 60601
P: (312) 372-3930
F: (312) 372-3939
cccinnamon@cm-chi.com

CM CINNAMON MUELLER

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This electronic mail transmission may contain confidential or privileged information. If you believe that you have received this message in error, please notify the sender by reply transmission and delete the message without copying or disclosing it.

****

EXHIBIT 6

Signal Strength Test Report

Station: WACP

Channel: 4

Frequency: 66 - 72 MHz

Headend: Oxford, PA — WACP

Latitude: 39 46 4 — 39 44 5

Longitude: 76 00 52 — 74 50 29

Bearing to Station
(Antenna Oriented for Maximum Signal Level): 91.72°

Distance to Station: 62.39 miles

Receiving Tower Height: 100'

Receiving Antenna Height: 90'

Measuring Instrument Manufacturer: Sunrise

Make/Model: AT2500RQv

Serial #: 8541-1109

Age of Unit: 3 years

Calibration Date: 10/2/12

Antenna Manufacturer: Scientific Atlanta

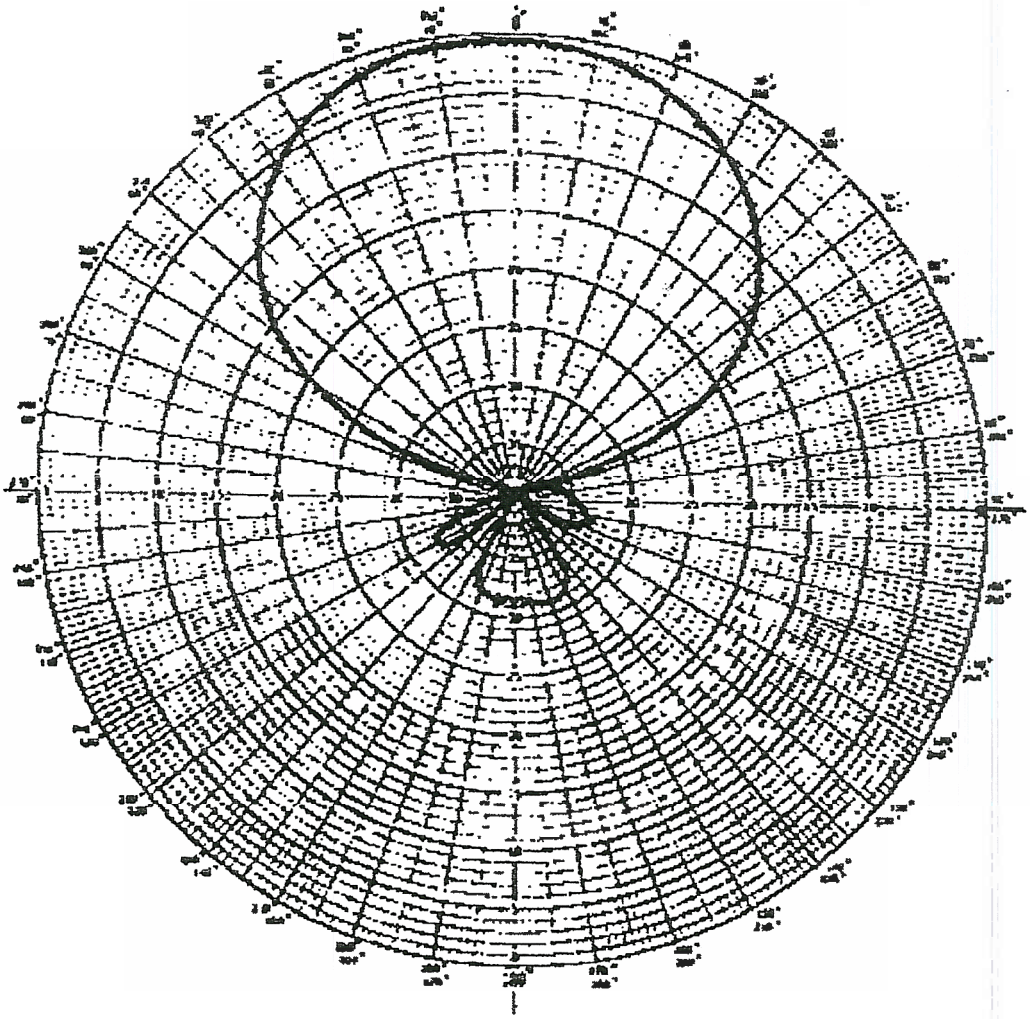
Model: QCA 2-6

Gain: 8.5 dBi

Range: _____

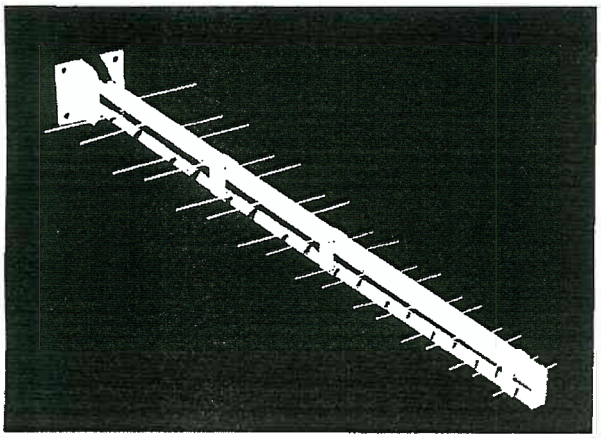
Radiation Pattern: Attached (attach diagram)

Measurements recording on the following page.



QCA-2-6, -2, -4, -7

Quadrate Channeler Log-Periodic



3909

Single Antennas, Series QCA

For installations that require a moderately narrow beamwidth antenna, one of the Series QCA single antennas will provide superior reception through its excellent front-to-back ratio and sidelobe suppression. The wide bandwidth of this antenna permits all VHF channels to be covered by only three antennas.

Mounting hardware is available to permit no-drilling, single-point mounting on round or angle tower sections or on wooden poles. No bracing or other supports are required.

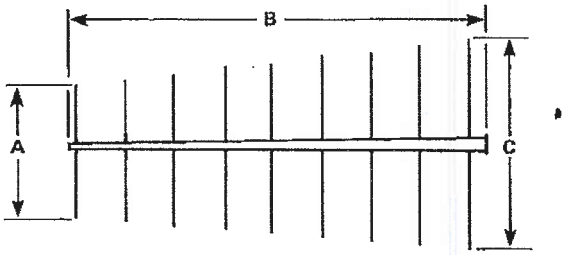
Specifications

Minimum front-to-back ratio
  25 dB (all models)
Minimum sidelobe suppression
  QCA-UHF
    30 dB
  All others
    25 dB

Output connector
  Type N male (Type N to F adapter supplied)
Output impedance
  50 Ω unbalanced
Wind survival at 0°C (+32°F) air temperature
  No ice
    160 km/h (100 mph)
Dimensions
  See table
Weight
  See table

	Antenna Model		
	QCA-2-6	QCA-2	QCA-4
Channel	2-6	2-3	4-6
Max VSWR	1.5:1	1.5:1	1.5:1
Min gain (dBi)	8.5	9.5	9.5
Beamwidth—H	70°	60°	60°
Beamwidth—V	95°	95°	95°
	QCA-7	QCA-UHF	QCA-FM
Channel	7-13	14-83	FM
Max VSWR	1.5:1	1.25:1	1.5:1
Min gain (dBi)	11.5	12.5	9.5
Beamwidth—H	50°	50°	60°
Beamwidth—V	65°	65°	95°

	Antenna Dimensions—mm (inches)		
	QCA-2-6	QCA-2	QCA-4
A	1295 (51)	1575 (62)	1194 (47)
B	3658 (144)	3658 (144)	3658 (144)
C	2870 (113)	2769 (109)	2362 (93)
	QCA-7	QCA-UHF	QCA-FM
A	495 (19.5)	127 (5)	1067 (42)
B	2413 (95)	1346 (53)	3658 (144)
C	864 (34)	330 (13)	1778 (70)



	Antenna Weights—kg (lbs)		
	QCA-2-6	QCA-2	QCA-4
Net	34 (76)	34 (76)	34 (76)
Shipping	102 (225)	102 (225)	102 (225)
	QCA-7	QCA-UHF	QCA-FM
Net	14 (31)	9.5 (21)	34 (76)
Shipping	59 (130)	18 (40)	79 (175)

Date	Time	Temperature Degrees F	Signal to Noise dB	Signal Level dBmV	Power Level dBmV	Power Level dBm	Weather Conditions	
2-Oct-12	13:00	66	23.5	-18	-13.2	-61.95	Rain/Fog	
2-Oct-12	14:00	66	23.8	-19.8	-15.8	-64.55	light raing/fog	
2-Oct-12	15:00	67	23.5	-20.6	-13.3	-62.05	light raing/fog	
2-Oct-12	16:00	68	24.5	-19.3	-15.3	-64.05	Fog/mist	
2-Oct-12	17:00	69	22.3	-21.3	-14.3	-63.05	Fog/mist	
2-Oct-12	18:00	70	21.7	-21.4	-14	-62.75	Fog/mist	
2-Oct-12	19:00	70	19.4	-23.8	-16.6	-65.35	Fog/mist	
2-Oct-12	20:00	70	22	-24.7	-18.2	-66.95	Fog/mist	
2-Oct-12	21:00	70	20.9	-22.7	-15.8	-64.55	Fog/mist	
2-Oct-12	22:00	70	21.6	-25	-16.1	-64.85	Fog/mist	
2-Oct-12	23:00	70	16.7	-27.5	-16.4	-65.15	Fog	
3-Oct-12	0:00	70	17	-26.8	-16.5	-65.25	Fog	
3-Oct-12	1:00	70	15.8	-30.1	-18.2	-66.95	Fog	
3-Oct-12	2:00	70	No Loc	-31.7	-18.1	-66.85	Fog/mist	
3-Oct-12	3:00	70	No Loc	-28.3	-19.1	-67.85	Fog/mist	
3-Oct-12	4:00	70	21	-21.7	-13	-61.75	Fog	
3-Oct-12	5:00	70	20.3	-24.1	-15.7	-64.45	Fog	
3-Oct-12	6:00	70	20.8	-22.4	-14.7	-63.45	Fog	
3-Oct-12	7:00	70	19.2	-23.3	-15	-63.75	Fog	
3-Oct-12	8:00	71	19.3	-22.2	-13.9	-62.65	Fog/mist	

Test Equipment Used

Spectrum Analyzer
Sunrise
Model: AT2500RQv
S/N: 8541-1109
Cal Date: 11/24/2009
Verified: 10/2/12

Signal Level Meter
Sunrise
Model: CM2000
S/N: 094901933
Cal Date: 12/10/2009
Verified: 10/2/12

Receiver
Tandberg
Model 8320
S/N: 07933

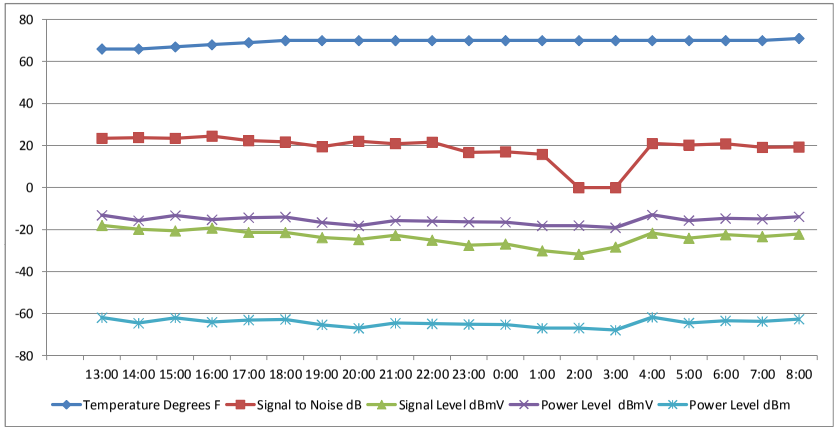


EXHIBIT 7

CM CINNAMON MUELLER
A Limited Liability Company

307 North Michigan Avenue, Suite 1020
Chicago, Illinois 60601
Telephone: 312-372-3930
Facsimile: 312-372-3939

Washington, D.C.
1333 New Hampshire Ave, NW, Fl 2
Washington, DC 20036

St. Louis
1714 Deer Tracks Trail, Ste 215
St. Louis, MO 63131

Christopher C. Cinnamon
Admitted in Illinois, Kansas, and Michigan

November 19, 2013

Scott Johnson
Fletcher, Heald & Hildreth
1300 North 17th Street, 11th Floor
Arlington, VA 22209
via email sjohnson@fhhlaw.com

Re: Armstrong Utilities, Inc. ("Armstrong")/WACP must carry request

Dear Mr. Johnson:

On behalf of Armstrong, we respond to your September 14, 2012 letter on behalf of WACP. That letter demanded must carry on Armstrong's Oxford, PA cable system.

Based on the attached Signal Strength Test Report, WACP does not meet the definition of "local commercial television station" under 47 CFR 76.55(c)(3). Consequently, WACP is not entitled to mandatory carriage under 47 CFR 76.56(b), and Armstrong declines the station's carriage request.

Sincerely,

Christopher C. Cinnamon

Enc.

Cc: Ed Hassler, Jr.
David R. Jamieson

Signal Strength Test Report

Station: WACP

Channel: 4

Frequency: 66 - 72 MHz

Headend: Oxford, PA — WACP

Latitude: 39 46 4 — 39 44 5

Longitude: 76 00 52 — 74 50 29

Bearing to Station
(Antenna Oriented for Maximum Signal Level): 91.72°

Distance to Station: 62.39 miles

Receiving Tower Height: 100'

Receiving Antenna Height: 90'

Measuring Instrument Manufacturer: Sunrise

Make/Model: AT2500RQv

Serial #: 8541-1109

Age of Unit: 3 years

Calibration Date: 10/2/12

Antenna Manufacturer: Scientific Atlanta

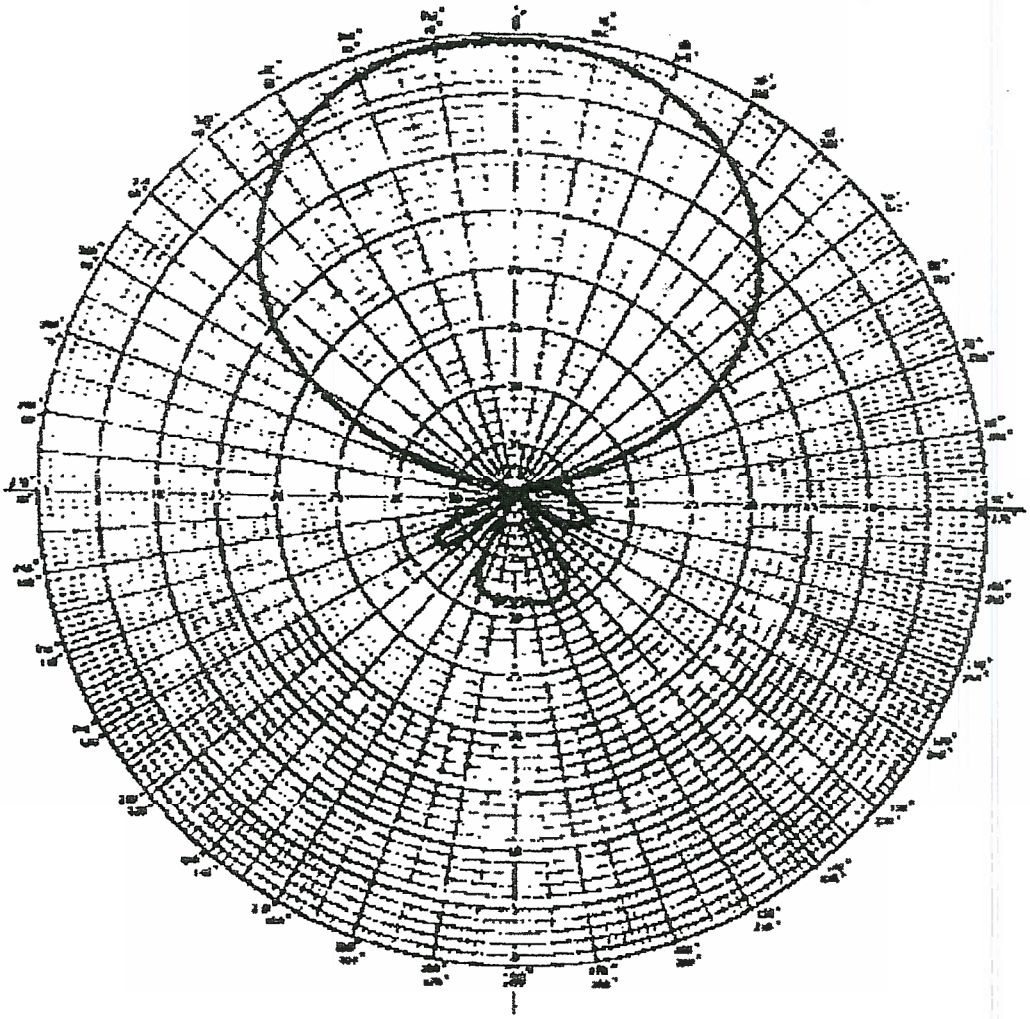
Model: QCA 2-6

Gain: 8.5 dBi

Range: _____

Radiation Pattern: Attached (attach diagram)

Measurements recording on the following page.



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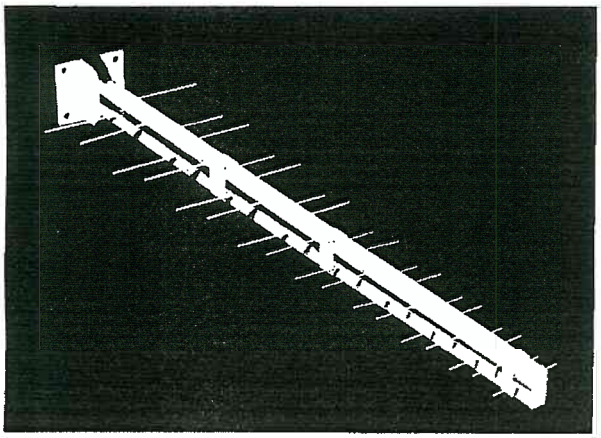

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Specifications

Minimum front-to-back ratio
  25 dB (all models)
Minimum sidelobe suppression
  QCA-UHF
    30 dB
  All others
    25 dB

Output connector
  Type N male (Type N to F adapter supplied)
Output impedance
  50 Ω unbalanced
Wind survival at 0°C (+32°F) air temperature
  No ice
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Channel	7-13	14-83	FM
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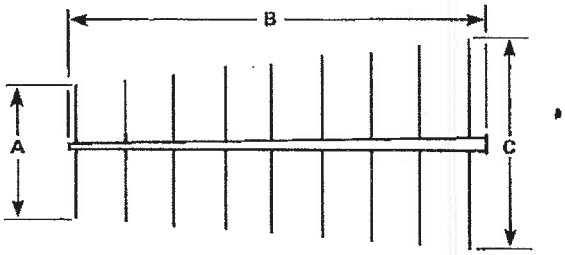

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Test Equipment Used

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Sunrise
Model: CM2000
S/N: 094901933
Cal Date: 12/10/2009
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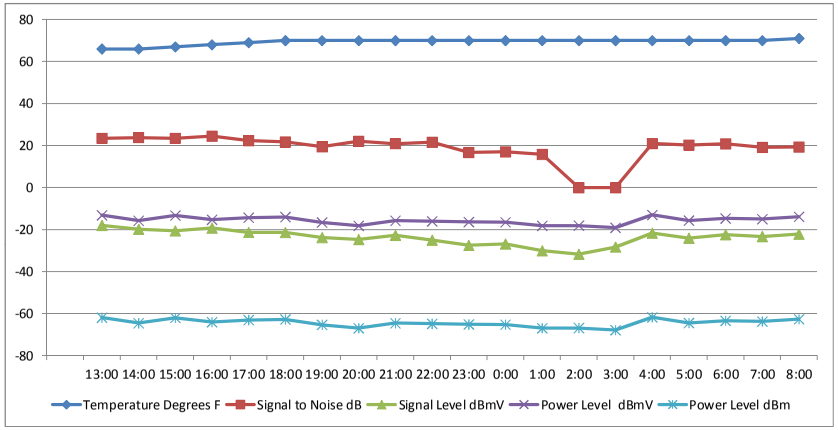
Receiver
Tandberg
Model 8320
S/N: 07933