

**INFORMAL REPORT  
IN SUPPORT OF A REQUEST FOR  
EXTENSION OF STA BDSTA-20091001ADW  
WTVD DURHAM, NORTH CAROLINA, FACILITY ID 8617  
CHANNEL 11 – 45.0 KW DTV AVERAGE – 615 M HAAT**

Licensee: WTVD Television, LLC

**Table of Contents**

**Informal Report**

**Measurement Data**

**Observed Spectrum and Signal Quality  
for 28 Measurement Locations**

**INFORMAL REPORT  
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Licensee: WTVD Television, LLC

I am a consulting engineer, an employee of the Carl. T. Jones Corporation, with offices in Springfield, Virginia. My education and experience are a matter of record with the Federal Communications Commission. I am a Registered Professional Engineer in the Commonwealth of Pennsylvania, Registration Number PE-027589E.

**Introduction**

WTVD was an early DTV broadcaster, one of several ABC Owned Television Stations that volunteered to begin DTV transmission early in November of 1999. From the beginning, WTVD operated DTV facilities on its initial allotment channel 52, with an ERP of 1000 KW and a non-directional antenna at an HAAT of 599 meters, building its initial allotment fully in less than 10 months after receiving its channel assignment. FCC File number BLCDDT-19991117ABU contains the description of the first WTVD DTV facility, which operated on channel 52 until June 12, 2009.

WTVD Television, LLC is the licensee of television station WTVD, Channel 11, Durham, North Carolina, Facility ID 8617. On September 25, 2008, the Commission granted WTVD a post transition construction permit which authorized WTVD, through BMPCDDT-20080822AAF, to operate on its NTSC channel with 20.7 kW at an HAAT of 615 meters.

In June, 2009, WTVD transitioned to DTV only transmission on channel 11. The initial allotment, channel 52 is out of core. Because some WTVD viewers were experiencing severe difficulties receiving WTVD after the DTV transition, WTVD studied the possibility of increasing power and concluded interference agreements with several stations which specified an ERP of 45.0 kW.

**Informal Report  
WTVD Television, LLC  
Television Station WTVD  
Durham, North Carolina  
March 2010, Page 2 of 10**

On October 5, 2009, the Commission granted WTVD's request and authorized WTVD to operate with 45 kW ERP with the antenna and the height that is specified in BMPCDT-20080822AAF. The outstanding authorization bears FCC File Number BDSTA-20091001ADW and also contained a request that a report be prepared and filed with the Commission which describes the results of field strength measurements taken before and after WTVD increased its ERP from 20.7 kW to 45.0 kW to assist the Commission in determining if the requested ERP increase resolved reception issues.

This Informal Report is intended to support an extension of the outstanding STA and also is intended to provide the Commission with the data and additional measurement information that was requested by the Commission on the second page of the outstanding STA. The instant report contains information that WTVD engineers gained through the process of visiting the homes of many viewers who had called the station and described their inability to receive WTVD after WTVD transitioned to DTV only operation on channel 11. Since just before the transition to DTV only transmissions, WTVD has visited 274 viewers' homes, successfully restored channel 11 reception to 263 of these homes, and distributed approximately 195 antennas which are suited to channel 11 indoor reception at no cost to the viewer.

Attached to this report are figures which show the properties of the received WTVD signals before and after the increase to 45.0 kW was made. At least one set of before and after measurements were made at each of 28 locations. At many of these locations, more than a single set of measurements were made. In addition, several WTVD viewers volunteered to provide an opportunity for WTVD engineering staff to make before and after indoor measurements. Two sets of measurements were taken by changing rooms at two of these residential measurement locations.

Data included in this report were taken by WTVD engineering and technical personnel and were supplied to the undersigned to assist in the preparation of this report. In all, 38 measurements were made of signals before and after the ERP increase to 45 kW ERP at 28 measurement locations and the results of each measurement are contained in the data that are appended to this report..

**Informal Report  
WTVD Television, LLC  
Television Station WTVD  
Durham, North Carolina  
March 2010, Page 3 of 10**

**Measurements**

No formal measurement program was designed to strictly control the process and procedures for the measurements which were made to obtain the data that are attached to this report. The WTVD engineering staff were devoting a great deal of time and expense to providing one-on-one assistance to those viewers who had difficulty receiving WTVD after the transition to DTV only transmission. Seeking and obtaining viewer permission to perform before and after measurements required a good deal of patience on the part of the viewer as a minimum of two visits by WTVD technical staff were required. As a consequence, the number of viewer locations where before and after measurements were performed is smaller than the number of locations where outdoor measurements were made. Indoor measurements were made at locations that varied from 11.3 to 27.7 miles from the WTVD transmitter.

A total of 28 measurement locations are found in this report. Of these, 6 locations are viewer locations, and at two of the viewer locations, measurements were made in more than one room. Even without a formal measurement plan, when including the outdoor only measurements, the locations include measurement data where propagation paths can be described as traversing urban, suburban and rural areas. Outdoor measurements were made at locations that varied between 7 and 51.4 miles.

The measurements were made with a consumer grade antenna and most measurement locations included a measurement made with the antenna raised to a height of 30 feet (9.14 meters). Attempts were made to replicate the location of the antenna where the 'before' measurements were made as precisely as possible when the 'after' measurements were made. For each measurement, the antenna was oriented for best reception. The term 'best reception' was not defined precisely as a maximum signal, flattest spectrum or highest quality as measured by a consumer grade tuner. Through observation of the recovered data, it can be surmised that in different locations, different criteria were applied to obtain best reception. One reason is that the signal quality measurement is not available until the received signal is of a sufficient quality or strength to produce a decoded bitstream and a picture. In locations

**Informal Report  
WTVD Television, LLC  
Television Station WTVD  
Durham, North Carolina  
March 2010, Page 4 of 10**

where a picture was not obtained, signal amplitude or spectral characteristics were the only two remaining criteria that could be applied. In many instances, the signal measurements were made by WTVD technical staff with little experience in field measurements or the equipment being used to obtain the measurements at the beginning of this process.

Although not noted in the data, artifacts of antenna preamplifier operation can be observed in several of the spectral plots that are included in this report. In general, these artifacts were obtained from measurements which were made with the antenna mounted on a 30 foot mast. Twenty-two measurement locations include measurements which were made with an antenna at 30 feet and an additional measurement was taken at the same location with an antenna at 6 feet (1.83 meters) at eight of these locations. Because the received signals are weaker when the antenna height of 6 feet or an indoor antenna was used, the measurements which were taken with an antenna height of 6 feet do not appear to contain wideband preamplifier artifacts. However, a pre-amplified antenna, a Terk model HDTV<sub>a</sub>, was used to obtain every measurement that is included in this report. A Rhode and Schwartz Schwarz FSH3-TV TV Analyzer with FSHTV-Z60 preselector was used to obtain and record the spectrum measurements.

No specific dates are shown in the data for either the before or after measurements, but the exact dates are available should the need arise. The before measurements were taken over the interval of October 9, 2009 through October 16, 2009. The after measurements were taken through the period beginning October 22, 2009 with the latest date indicating a measurement on or after January 13, 2010. The after measurements were made while operating under the terms of the outstanding STA with the authorized ERP of 45.0 kW.

**Data**

The data were obtained by use of single point measurements. No measurements were made through use of the technique that was employed years ago to obtain the TASO analog signal strength measurements. The TASO technique requires movement of an antenna at a height of 30 feet along a course of approximately 100 feet or more. Vehicles with 30 foot masts are commonly used to gather news electronically. Most stations that support a news

**Informal Report  
WTVD Television, LLC  
Television Station WTVD  
Durham, North Carolina  
March 2010, Page 5 of 10**

department have a fleet of these vehicles. Over the years there have been serious accidents that have occurred when an extended mast made electrical contact with energized power lines. Several accidents where the vehicle was moved while the mast was extended have been reported.

Because of safety concerns, operating procedures were adopted by those organizations who support a news or news gathering function that preclude operation of a vehicle while the mast is extended. These safety procedures now preclude any measurements which require movement of a vehicle while its mast is extended. Because these safety procedures apply to all WTVD vehicles, no measurements where TASO or other techniques which require movement of a vehicle with its mast extended were made.

Being limited to single point measurements, the data obtained also include examples of time and location statistics. This is particularly noticeable in those measurements where the amplitude of the ATSC pilot signal was used to indicate the amplitude of the received signal. In addition, the variations of signal strength also include effects caused by seasonal changes over as much as a three month period.

Measurements were made at 28 locations. Each location is described by a sequential number and a name, and the location description also includes GPS coordinates. Antenna placement at viewer locations is described by location in the dwelling in addition to the city and street location. Outdoor antenna locations are described by the height of the mast upon which the antenna was mounted. A total of 38 measurements were made at the 28 locations described in the data that are included with this report.

Because there was no formalized measurement plan, there was no strict calibration procedure that was followed that would assure accurate field strength measurements from the measurement of obtained signal strength. Any particular signal strength measurement cannot be related strictly to another signal strength measurement at a different time. In addition, the consumer antennas that were used to make measurements for this report use adjustable elements, which can also change the relationship of field strength to indicated signal strength on a measuring device such as a spectrum analyzer. The indication of signal quality obtained from the consumer grade tuner is more an indication of signal quality in terms of overall recovered bitstream MER or bit error rate.

**Informal Report  
WTVD Television, LLC  
Television Station WTVD  
Durham, North Carolina  
March 2010, Page 6 of 10**

**Data Characteristics**

The number of measurement locations is small by comparison to many formal signal measurement plans, but the data exhibit characteristics which are well within expectations when the properties of statistical propagation at 200 MHz are considered.

The single point measurements show a good correlation in the before and after measurements. After the increase allowed by the outstanding STA, the data show approximately 20 measurement locations where measurement of the signal strength or signal quality showed an improvement when the transmitted signal was increased by 3.37 dB from 20.7 kW to 45.0 kW. Five sets of measurements showed no change, including three sets of measurements at locations where no picture was obtained before or after the increase, and five sets of measurements where signal strength or quality decreased, with two sets of measurements taken from a mast mounted antenna at 30 feet and the remaining three sets were made with the antenna at 6 feet.

Several measurements were made in directions toward adjacent channels. Measurement Location 27, Fremont, is located about 32.1 miles (51.6 KM) from the WTVD transmitter. Location 27 is also approximately 35.1 miles (56.5 KM) from WNCT, channel 10, Greenville and approximately 47.1 miles (75.8 KM) from WCTI, channel 12, New Bern. At this location the received quality indication changed from an indicated 54 to an indicated 87 (arbitrary units indicated by the consumer grade tuner). No instance of loss of picture or other manifestation of adjacent channel interference was found at any measurement location. In the attached data, most loss of picture situations are attributable directly to weak received signals. In locations where a signal appears to be sufficiently strong that recovery of a picture should be possible but is not, the associated spectrum is usually highly distorted by multipath effects. Signal processing in the receiver's channel equalizer can quickly reach diminishing returns when restoration of the spectrum causes degradation of the signal to noise ratio.

Reception location 24, Wilson Mills, is a good example of the spectrum that is obtained from an overloaded preamplifier. The spectrum in an adjacent channel displays the classic haystack shape as the DTV spectrum is convolved on itself. Also visible in the spectrograph is the increased level of intermodulation products. Products outside the channel are visible, and products inside the

**Informal Report  
WTVD Television, LLC  
Television Station WTVD  
Durham, North Carolina  
March 2010, Page 7 of 10**

channel, although not visible because of masking by the stronger desired signal, are still present within the channel and cause degradation of the desired signal. These nonlinear intermodulation products are observed to increase at a rate that is approximately twice the rate of increase in signal strength that causes them. At the Wilson Mills location, the received signal quality decreases from 97 to 94 while the received signal increases from -46.29 dBm to -42.44 dBm. Although a picture is obtained in each case, the antenna pre-amplifier has degraded the signal and caused a slight loss in received desired signal quality as well as a loss of sensitivity in the adjacent channels. This is a non-linear effect and a channel equalizer, which is limited to correction of linear effects, is not able to improve the signal when non-linear effects are encountered. Pre-amplifier overload is also prone to generate spurious signals. Such signals can be produced by two very strong FM stations that are spaced about 2 MHz, or from internally generated spurious oscillations. Several measurement points display this type of indication in the attached data.

**Indoor Reception**

Indoor receiving antenna location can be critical. Standing wave patterns inside a dwelling are affected by electrical wiring, metallic ductwork, metallic screens and other nearby conductors. Maximum and minimum signal levels can vary widely. WTVD viewers report loss of DTV reception after moving a receiving antenna very short distances. One viewer with an indoor antenna has reported loss of reception after lifting the antenna to dust its supporting surface and then replacing the antenna in an exact location as can be remembered on a casual basis.

As an example, Location 11, Viewer 3, Raleigh, found a good indoor antenna location on the kitchen table. The location did not prove to provide repeatable reception performance, however, possibly because the location as described is used for other household functions in addition to supporting the DTV receiving antenna, causing the antenna to be moved frequently.

In the effort to restore channel 11 reception to its viewers, WTVD engineers and technical staff have learned that indoor antenna placement and orientation is critical. Several viewers were happy when reception was restored but were not content with required antenna location.

**Informal Report  
WTVD Television, LLC  
Television Station WTVD  
Durham, North Carolina  
March 2010, Page 8 of 10**

WTVD has visited approximately 274 viewer homes in an effort to assist channel 11 viewers to restore reception after channel 11 reception was lost when the transition to DTV transmission occurred in June, 2009. Successful restoration of channel 11 reception was achieved in 263 instances. This is a restoration rate of approximately 96%. Although some of the homes had outdoor antennas, the majority of the reception losses after the transition were in locations which used an indoor receiving antenna.

**Improvements to Assist Viewers**

To assist the consumer in obtaining the best possible received signal, most consumer ATSC tuners incorporate some relative indicator of received signal quality. Many of these indicators do not function until a signal is discovered that is of sufficient strength and quality to permit reception of a picture. In many instances, an indication of the presence or absence of a signal prior to demodulation would be helpful in assisting the consumer to adjust the receiving antenna for best results.

In most cases, the signal indications presented to the consumer are an indication of received signal quality, not necessarily signal strength. In some instances, the highest quality signal may be received from a direction that does not produce the strongest signal strength. This indication is found in several of the measurement locations that are attached to this report. This indication of received signal quality is important, but it should be augmented with an additional indication of signal strength. If a signal strength indicator were available before a picture is received, the viewer could use this initially to attempt to obtain a picture. If that same signal strength indicator were available after a picture is obtained in addition to a quality indication, it could aid the viewer and prevent the viewer from driving the signal into a cliff-effect area where small changes in amplitude cause a loss of lock and picture. Most viewers find this ragged-edge situation very annoying.

Antenna mounted pre-amplifiers are prone to overload from signals that are strong and may be overloaded by signals that are out of the range where reception is desired. Very few, if any, of these pre-amplifiers incorporate any

**Informal Report  
WTVD Television, LLC  
Television Station WTVD  
Durham, North Carolina  
March 2010, Page 9 of 10**

automatic gain control to prevent output-stage or other overload when strong signals are encountered. Design of a fixed gain pre-amplifier with a wide bandwidth, reasonable gain, good dynamic range and good overload and intermodulation performance is not trivial.

WTVD notes that in the homes visited, none of the 274 homes showed any signs of antenna pre-amplifier overload, indicating that an amplified indoor antenna can be used indoors in almost all situations without fear of pre-amplifier overload. This also indicates that most if not all of the viewers who lost channel 11 reception with indoor antennas were experiencing weak signal problems.

**Conclusions**

The data show that the increase in ERP of only 3.37 dB has improved reception in at least one set of measurements at 20 of 28 measurement locations. The data also show that 6 of 8 indoor measurements showed reception improvements. Of the 6 indoor locations, 4 locations showed improvement, one location's measurement results were split, with one up and the second measurement down, and one location had a single measurement which showed a decrease in received quality.

Three measurement locations failed to produce a picture before and after 45 kW operation. At least one set of measurement at three locations was able to obtain a picture with WTVD operating at 45 kW ERP that could not obtain a picture before the increased ERP was employed.

The data are insufficient to predict what increased ERP, if any, could produce a picture at the three measurement locations where no picture was obtained.

Some measurements showed changes in received quality that are contrary to expectations. These changes are attributable to the statistical nature of propagation, or the possibility that, in a few instances, the reference levels were changed on the measurement device.

**Informal Report  
WTVD Television, LLC  
Television Station WTVD  
Durham, North Carolina  
March 2010, Page 10 of 10**

Because the data are sparse, the repeatability of the measurements may not be as uniform as could be obtained if the data contained more measurement points. The data indicate that this increase did cause improved reception in a majority of the locations observed and that continued operation with an ERP of 45.0 kW at WTVD will help to assure continuing service to those viewers who have been able to restore their reception of WTVD as provided by an ERP of 45 kW.

**Certification**

I certify that, on behalf of WTVD Television, LLC, licensee of WTVD, I have prepared the information contained in this Report, and that the information contained in this Report is based on information and data which were obtained and collected by others. After such preparation I have examined the information contained in this report and I believe it to be accurate and true to the best of my knowledge.



Signed: \_\_\_\_\_  
Alfred E. Resnick, P. E.

Dated: March 26, 2010

**Location**  
1 Hurdle Mills

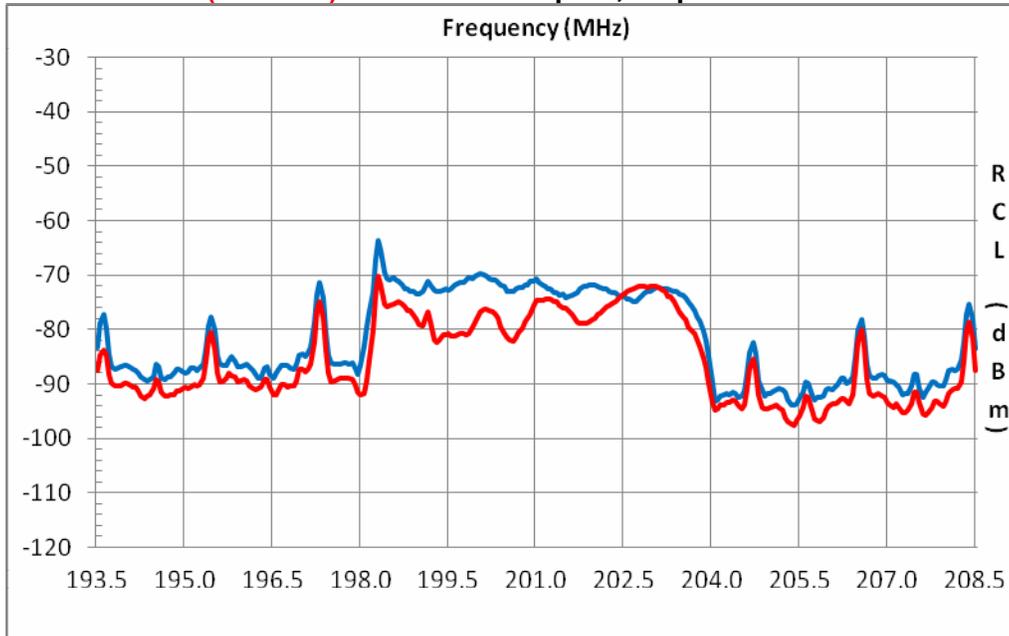
**GPS Coordinates Vector to Transmitter**  
N 36° 13' 29.8"

Ch. 11: 147°(SE) 51.4 miles

**Peak on Ch. 11** Terk aerials in "V" position, on 30 foot mast 001 004

**Before (10/16/09)** -63.73 dBm on pilot, no picture on tuner

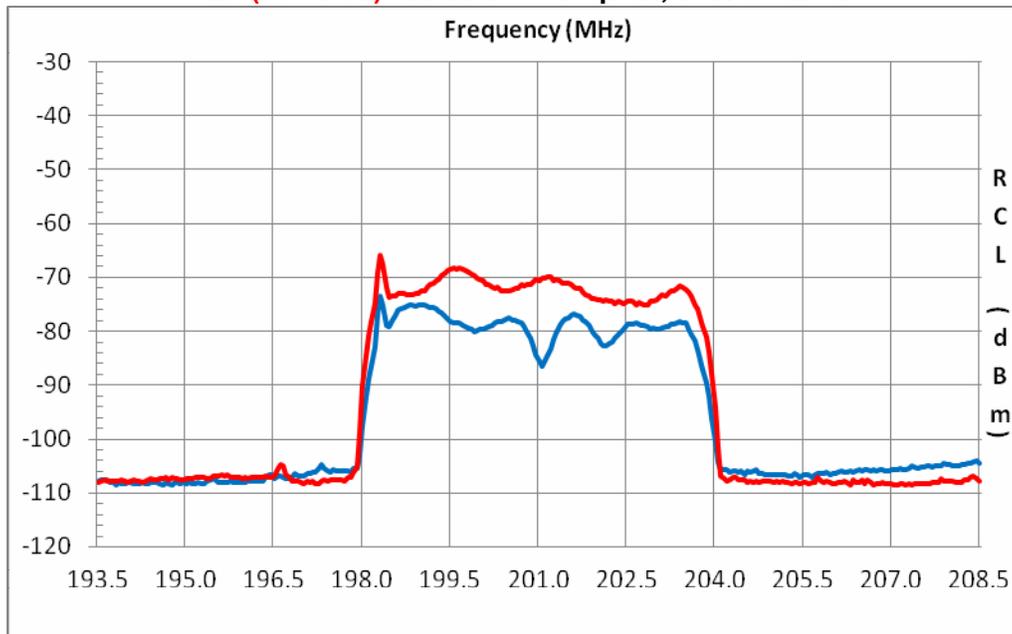
**After (10/23/09)** -70.24 dBm on pilot, no picture on tuner



**Peak on Ch. 11** Terk aerials in "V" position, on 6 foot pole 000 003

**Before (10/16/09)** -73.38 dBm on pilot, 87% on tuner

**After (10/23/09)** -65.89 dBm on pilot, 97% on tuner



**Location**

**GPS Coordinates Vector to Transmitter**

2 Hillsborough

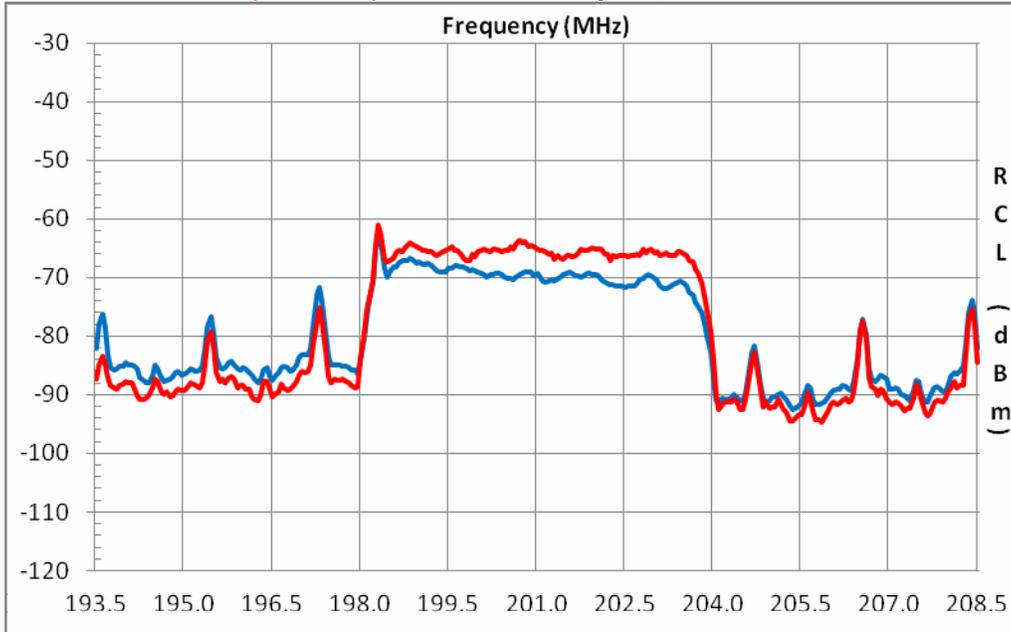
N 36° 03' 24.0"  
W 079° 03' 02.6"

Ch. 11: 141°(SE) 39.8 miles

**Peak on Ch. 11** Terk aerials in "V" position, on 30 foot mast 001 002

**Before (10/16/09) -62.31 dBm on pilot, no picture on tuner**

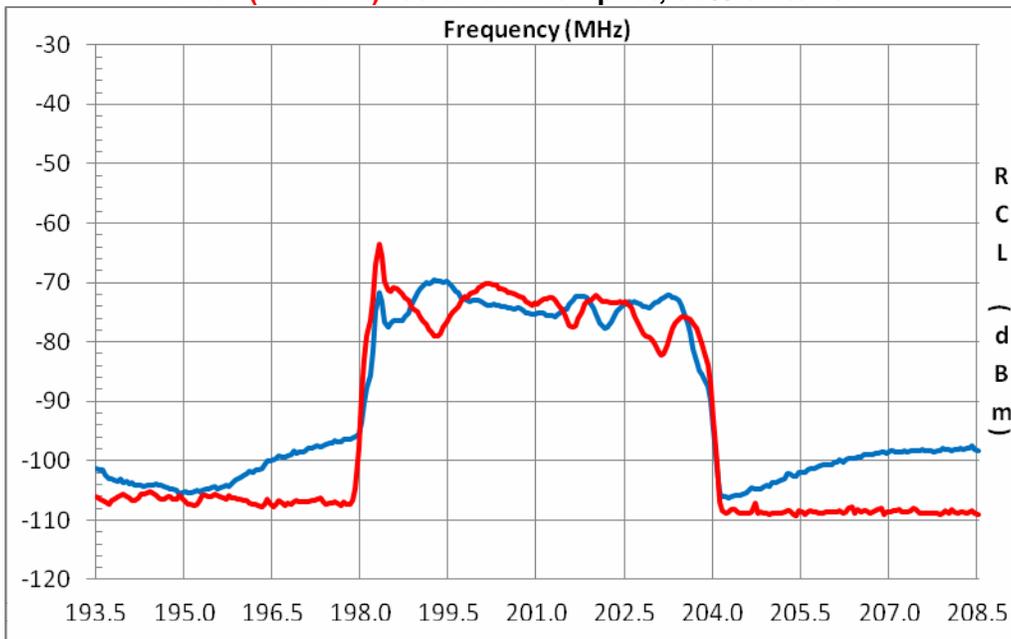
**After (10/23/09) -60.94 dBm on pilot, 52% on tuner**



**Peak on Ch. 11** Terk aerials in "V" position, on 6 foot pole 000 003

**Before (10/16/09) -71.62 dBm on pilot, 82% on tuner**

**After (10/23/09) -63.64 dBm on pilot, 90% on tuner**



**Location**

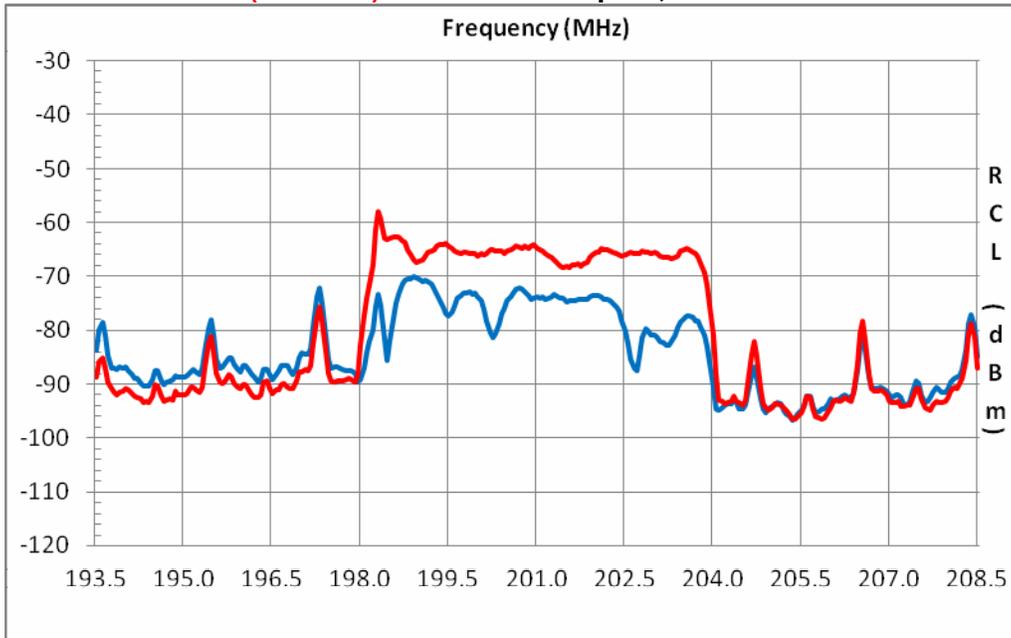
**GPS Coordinates Vector to Transmitter**

3 Chapel Hill-Carrboro

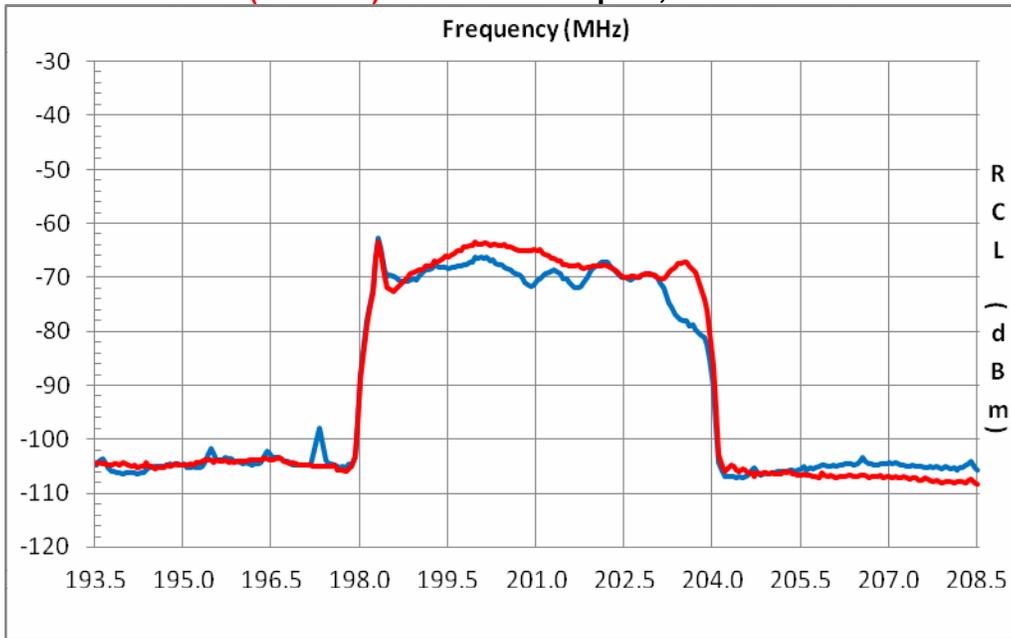
N 35° 56' 04.8"  
W 079° 08' 24.7"

Ch. 11: 127°(SE) 39.1 miles

**Peak on Ch. 11** Terk aerials in "V" position, on 30 foot mast 001 004  
**Before (10/16/09)** -73.28 dBm on pilot, no picture on tuner  
**After (10/22/09)** -57.96 dBm on pilot, 60% on tuner



**Peak on Ch. 11** Terk aerials in "V" position, on 6 foot pole 000 003  
**Before (10/16/09)** -62.62 dBm on pilot, 97% on tuner  
**After (10/22/09)** -63.38 dBm on pilot, 97% on tuner



**Location**

**GPS Coordinates Vector to Transmitter**

4 Apex

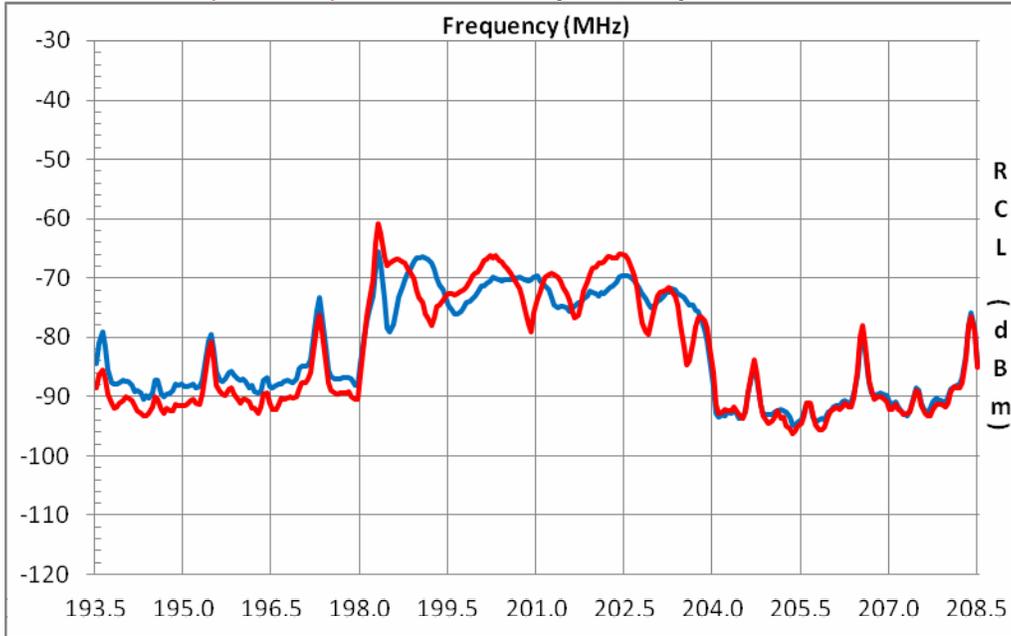
N 35° 45' 11.2"  
W 078° 57' 29.4"

Ch. 11: 112°(SEE) 25.0 miles

**Peak on Ch. 11** Terk aerials in "V" position, on 30 foot mast 001 003

**Before (10/16/09) -65.64 dBm on pilot, no picture on tuner**

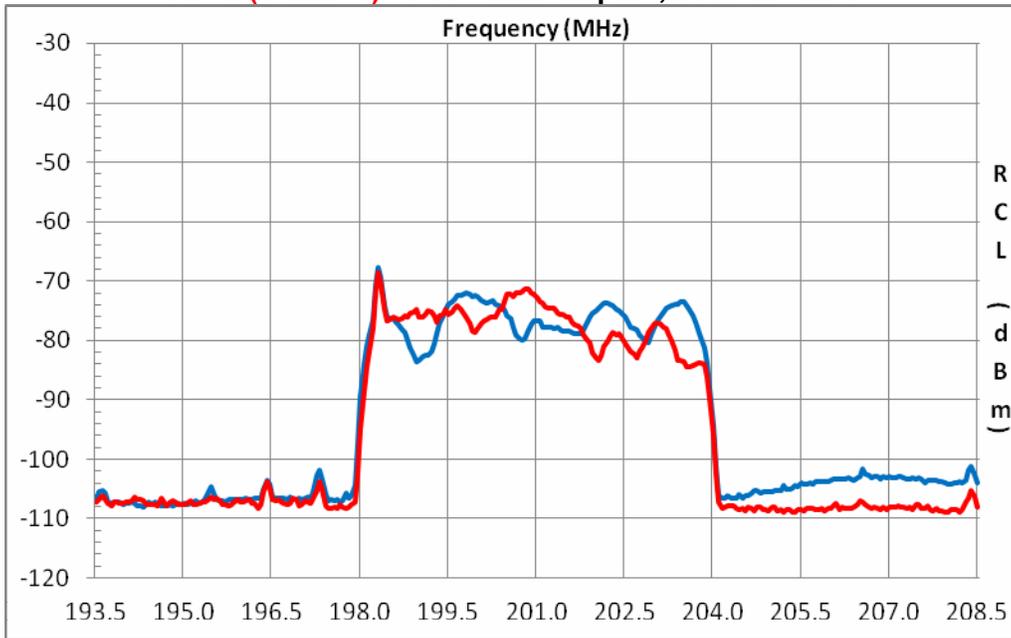
**After (10/23/09) -60.85 dBm on pilot, no picture on tuner**



**Peak on Ch. 11** Terk aerials in "V" position, on 6 foot pole 000 002

**Before (10/16/09) -67.62 dBm on pilot, 80% on tuner**

**After (10/23/09) -68.49 dBm on pilot, 81% on tuner**



**Location**

**GPS Coordinates Vector to Transmitter**

5 Cary

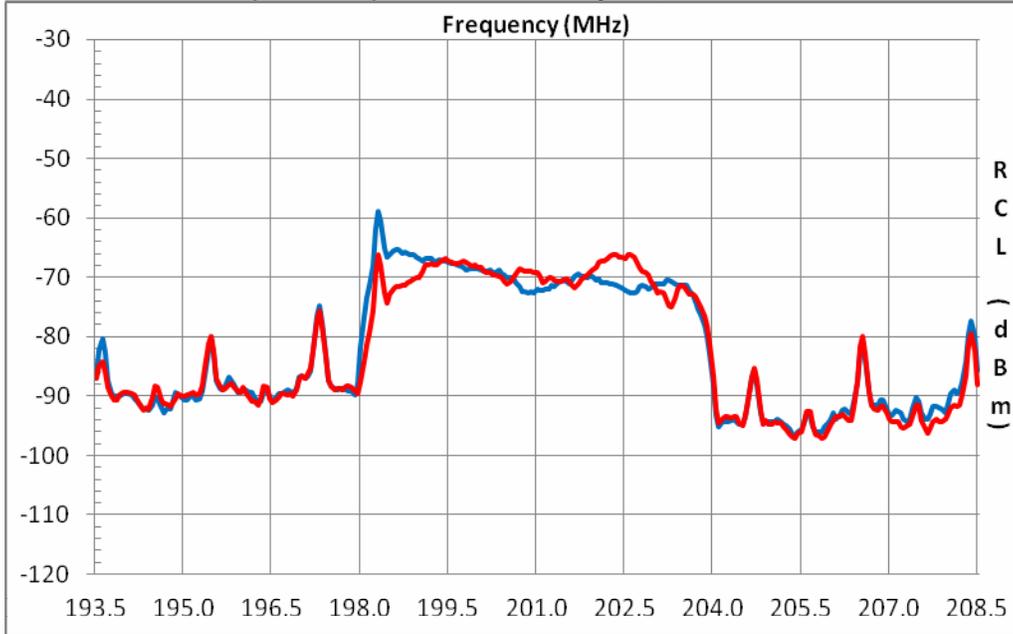
N 35° 48' 26.2"  
W 078° 46' 31.4"

Ch. 11: 133°(SE) 17.0 miles

**Peak on Ch. 11** Terk aerials in "V" position, on 30 foot mast 001 003

**Before (10/16/09)** -58.83 dBm on pilot, 47% on tuner

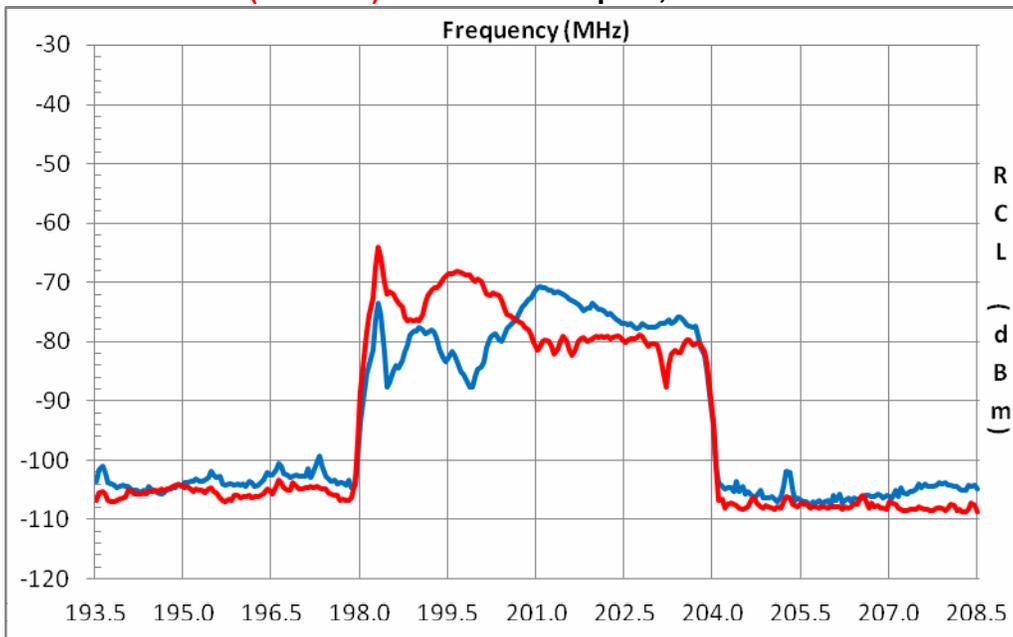
**After (10/22/09)** -66.21 dBm on pilot, 40% on tuner



**Peak on Ch. 11** Terk aerials in "V" position, on 6 foot pole 000 002

**Before (10/16/09)** -73.59 dBm on pilot, 35% on tuner

**After (10/22/09)** -64.00 dBm on pilot, 73% on tuner



**Location**

**GPS Coordinates Vector to Transmitter**

6 Raleigh

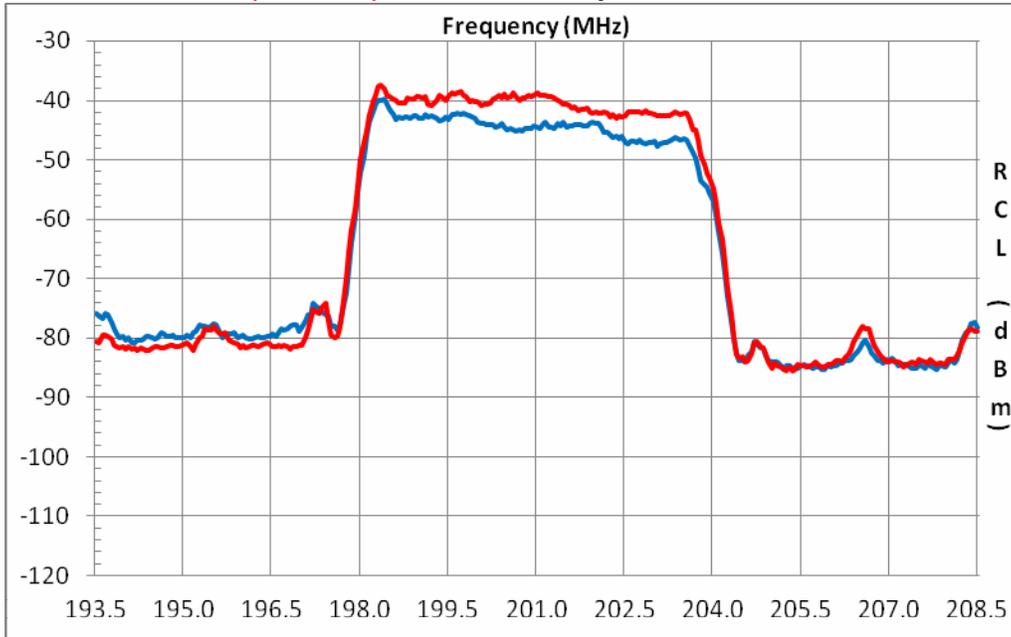
N 35° 43' 55.0"  
W 078° 37' 21.5"

Ch. 11: 138°(SE) 7.0 miles

**Peak on Ch. 11** Terk aerials in "V" position, on 30 foot mast 001 003

**Before (10/14/09)** -39.19 dBm on pilot, 86% on tuner

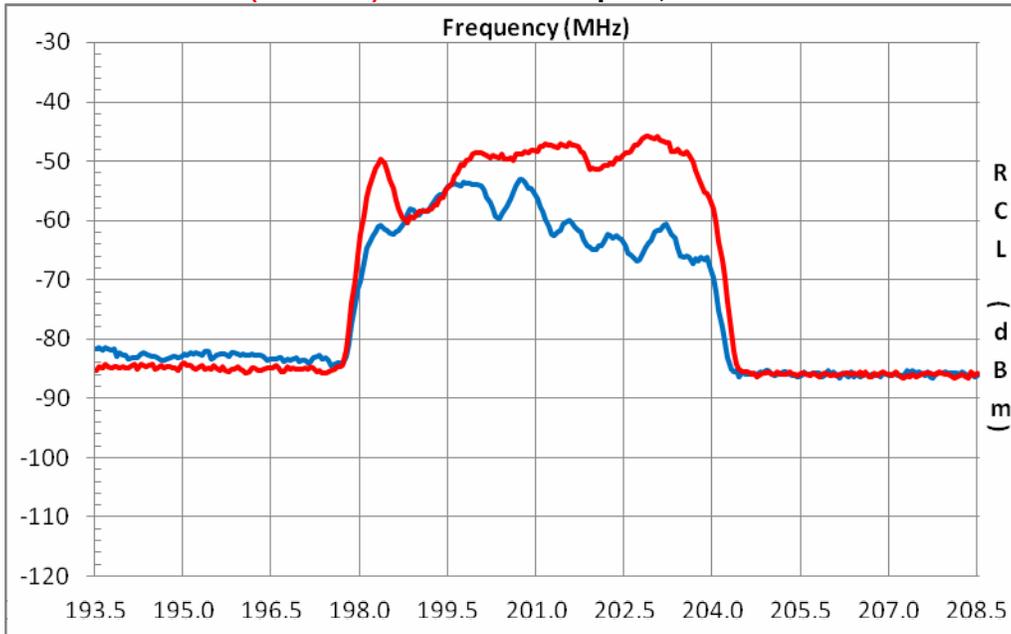
**After (10/22/09)** -36.15 dBm on pilot, 97% on tuner



**Peak on Ch. 11** Terk aerials in "V" position, on 6 foot pole 000 002

**Before (10/14/09)** -60.39 dBm on pilot, 72% on tuner

**After (10/22/09)** -49.67 dBm on pilot, 86% on tuner



**Location**

**GPS Coordinates Vector to Transmitter**

7 Durham miles

N 36° 03' 23.6"

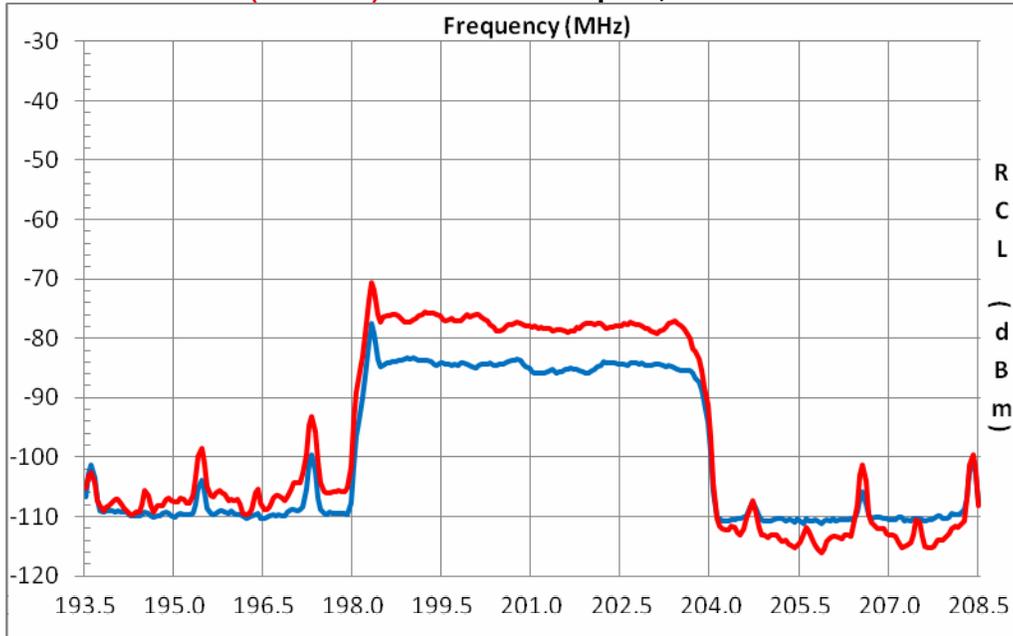
Ch. 11: 160°(SSE) 30.8

W 078° 47' 42.2"

**Peak on Ch. 11** Terk aerials in "V" position, on 30 foot mast 001 003

**Before (10/14/09)** -77.50 dBm on pilot, 75% on tuner

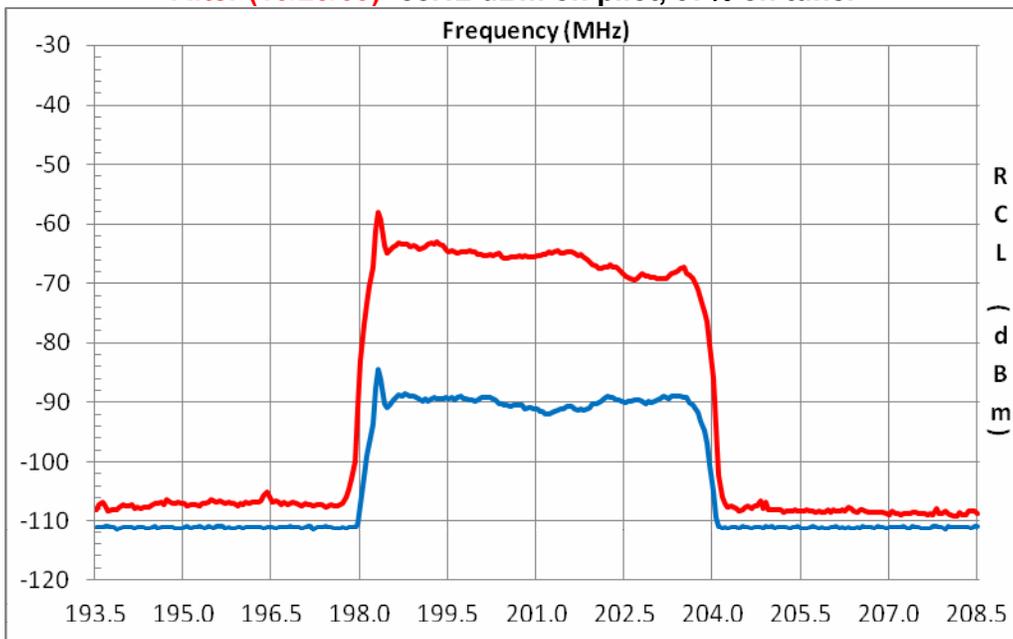
**After (10/23/09)** -55.70 dBm on pilot, 77% on tuner



**Peak on Ch. 11** Terk aerials in "V" position, on 6 foot pole 000 002

**Before (10/14/09)** -84.50 dBm on pilot, 97% on tuner

**After (10/23/09)** -58.12 dBm on pilot, 97% on tuner



**Location**

**GPS Coordinates Vector to Transmitter**

8 Wake Forest

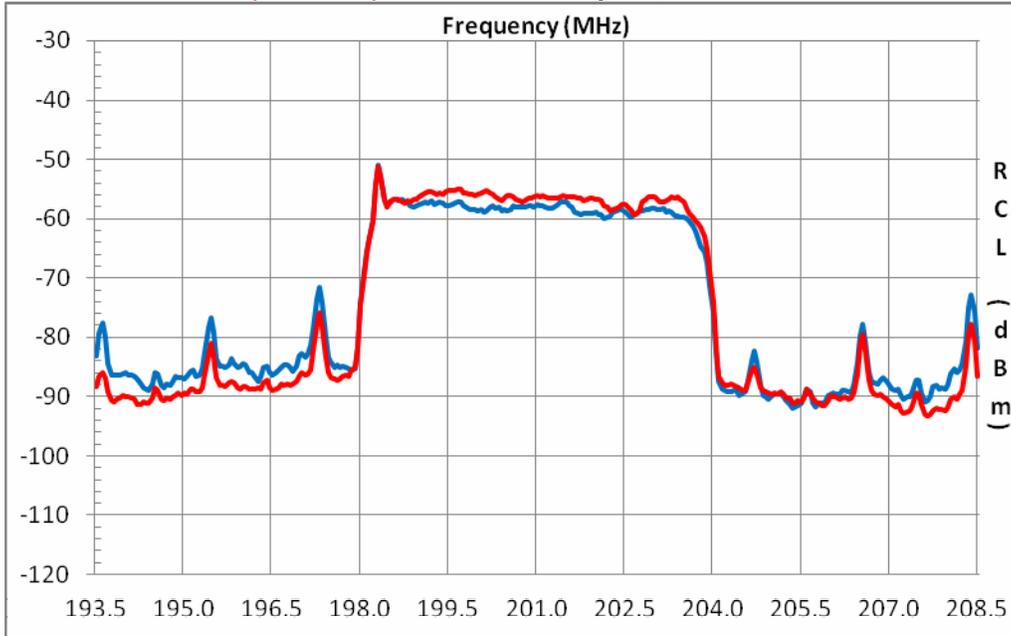
N 35° 59' 19.5"  
W 078° 41' 32.2"

Ch. 11: 166°(SSE) 24.0 miles

**Peak on Ch. 11** Terk aerials in "V" position, on 30 foot mast 001 003

**Before (10/16/09)** -51.05 dBm on pilot, 75% on tuner

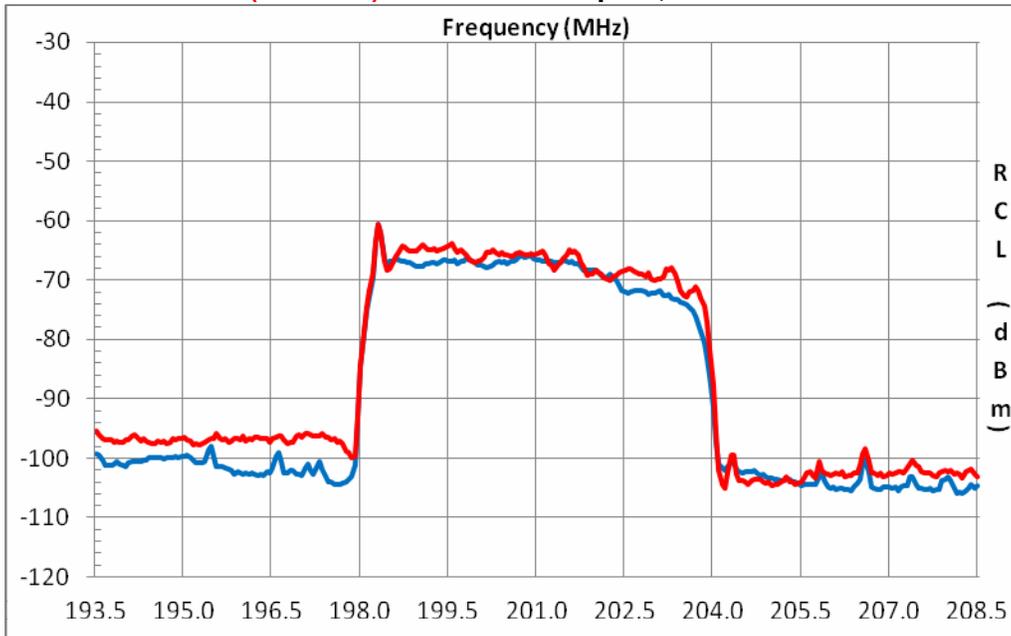
**After (10/23/09)** -51.21 dBm on pilot, 87% on tuner



**Peak on Ch. 11** Terk aerials in "V" position, on 6 foot pole 000 002

**Before (10/16/09)** -60.54 dBm on pilot, 94% on tuner

**After (10/23/09)** -60.62 dBm on pilot, 95% on tuner



**Location**

**GPS Coordinates Vector to Transmitter**

9 –Viewer 1  
Magnolia Bloom Ct.  
Cary

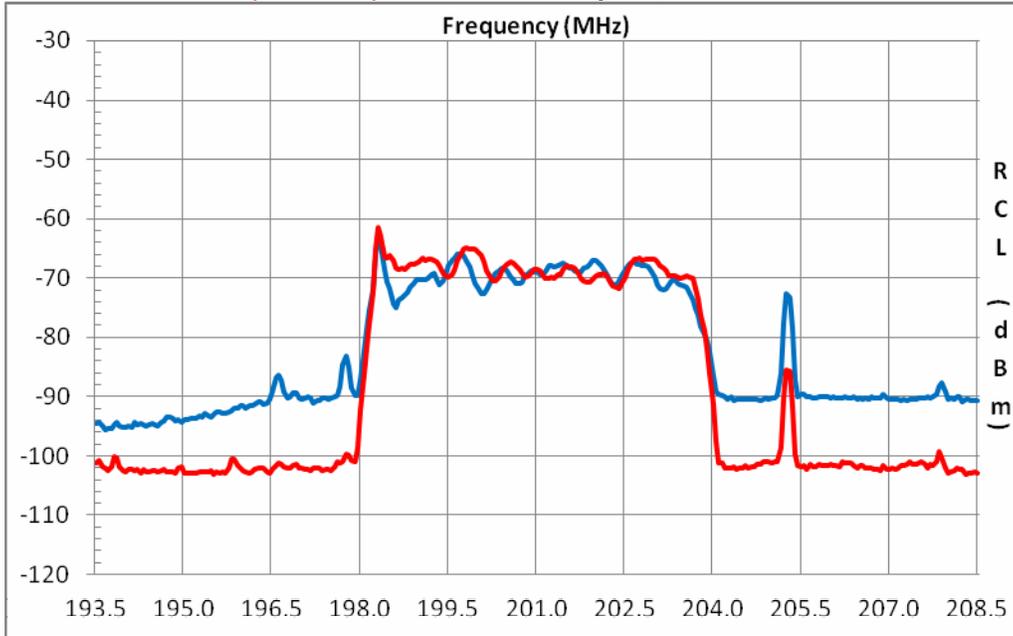
N 35° 49' 10.5"  
W 078° 51' 07.7'

Ch. 11: 129°(SE) 21.1 miles

**Peak on Ch. 11** Terk aerials in "V" position, On TV shelf, right side, pointed right 000 001

**Before (10/8/09) -62.66 dBm on pilot, 36% on tuner**

**After (11/05/09) -61.42 dBm on pilot, 82% on tuner**



**Location**

**GPS Coordinates Vector to Transmitter**

10 Viewer 2  
Timber Hitch Rd.  
Cary

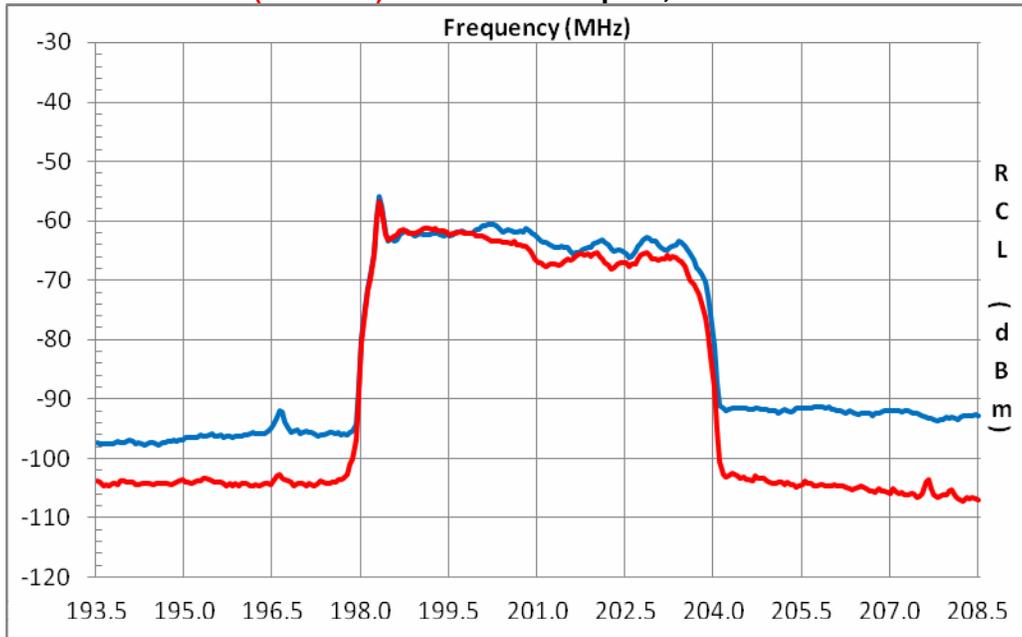
N 35° 47' 46.0"  
W 078° 50' 26.6"

Ch. 11: 125°(SE) 19.8 miles

**Peak on Ch. 11** Terk aerials in "V" position, On mantle, pointed back, slightly right/back 000 002

**Before (10/8/09)** -55.99 dBm on pilot, 87% on tuner

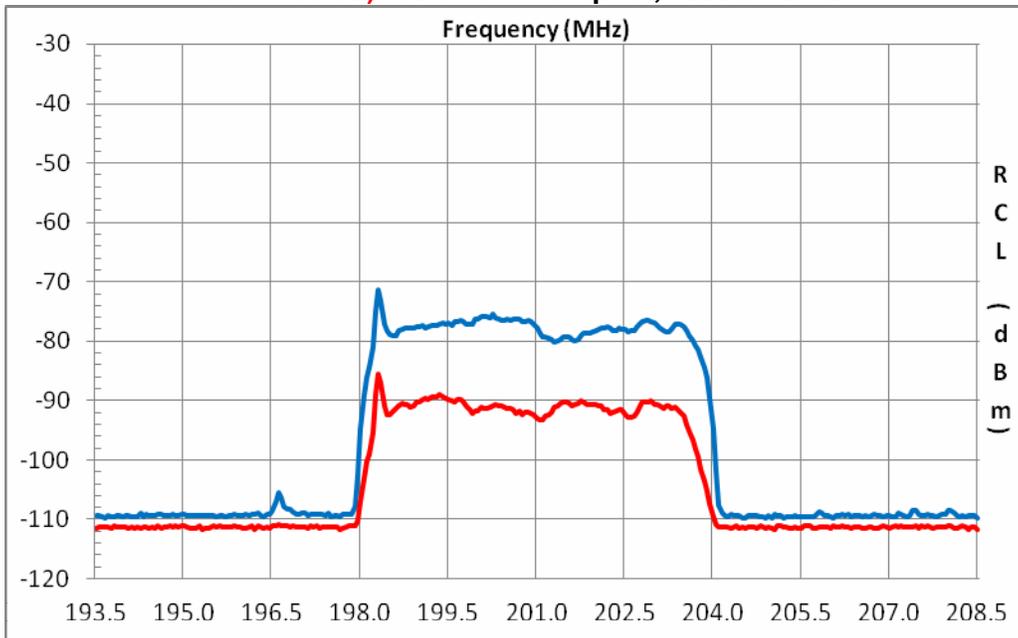
**After (11/05/09)** -56.84 dBm on pilot, 95% on tuner



**Peak on Ch. 11** generic non-amp in "V" position, On mantle, pointed back, slightly right/back 001 003

**Before (10/8/09)** -71.29 dBm on pilot, 92% on tuner

**After 11/05/09)** -85.51 dBm on pilot, 75% on tuner



**Location**

**GPS Coordinates Vector to Transmitter**

11 Viewer 3  
Evander Way  
Raleigh

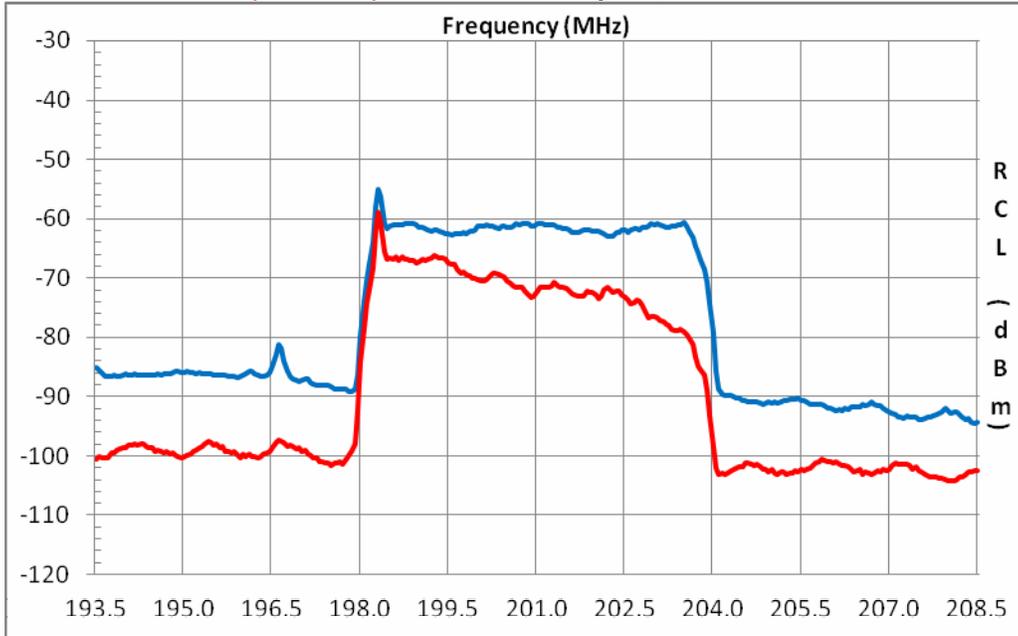
N 35° 53' 46.8"  
W 078° 41' 59.3"

Ch. 11: 157°(SE) 18.5 miles

**Peak on Ch. 11** Terk aerials in "V" position, Kitchen table, pointed right out window 000 001

**Before (10/8/09) -54.98 dBm on pilot, 80% on tuner**

**After (11/06/09) -59.00 dBm on pilot, 70% on tuner**



**Location**

**GPS Coordinates Vector to Transmitter**

12 Viewer 4  
Forgotten Pond Ave.  
Wake Forest

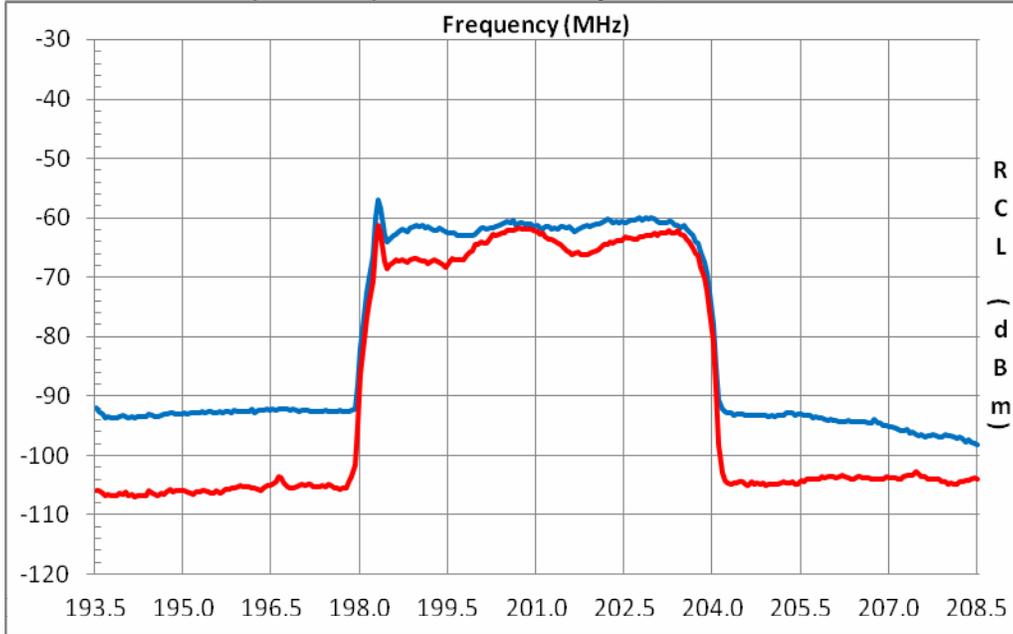
N 35° 56' 19.5"  
W 078° 29' 47.3"

Ch. 11: 194°(S) 18.8 miles

**Peak on Ch. 11** Terk aerials in "V" position, Dresser left, pointed forward/left 000 001

**Before (10/8/09) -56.95 dBm on pilot, 92% on tuner**

**After (11/13/09) -61.37 dBm on pilot, 95% on tuner**



**Location**

**GPS Coordinates Vector to Transmitter**

13 Viewer 5  
Wellingham Dr.  
Durham

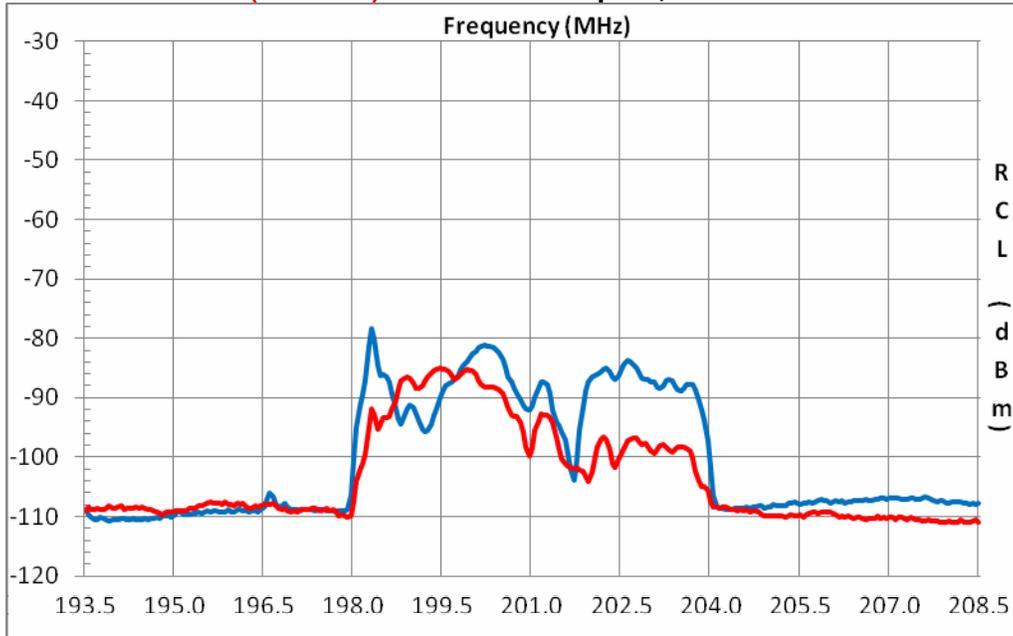
N 35° 54' 18.5"  
W 078° 55' 26.3"

Ch. 11: 135°(SE) 27.7 miles

**Peak on Ch. 11** Non-amp, Upstairs bedroom, pointed out window 000 003

**Before (10/8/09)** -58.29 dBm on pilot, 42% on tuner

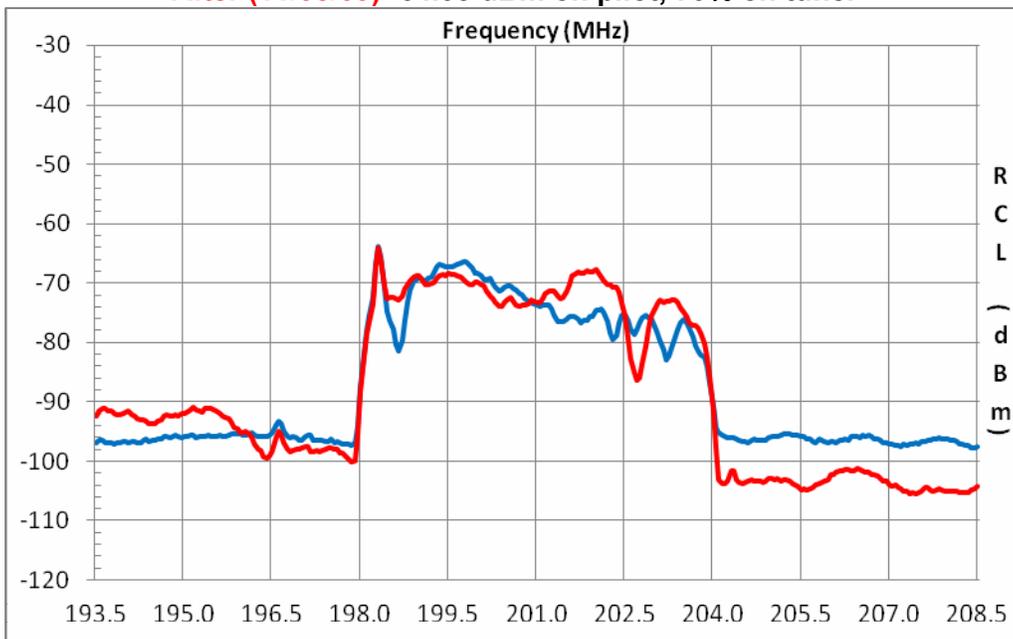
**After (11/05/09)** -91.77 dBm on pilot, 60% on tuner



**Peak on Ch. 11** Terk aerials in "V" position, Upstairs bedroom, pointed out window 001 002

**Before (10/8/09)** -63.87 dBm on pilot, 41% on tuner

**After (11/05/09)** -64.03 dBm on pilot, 70% on tuner



**Location**

**GPS Coordinates Vector to Transmitter**

14 Viewer 6  
Bickett Blvd.  
Raleigh

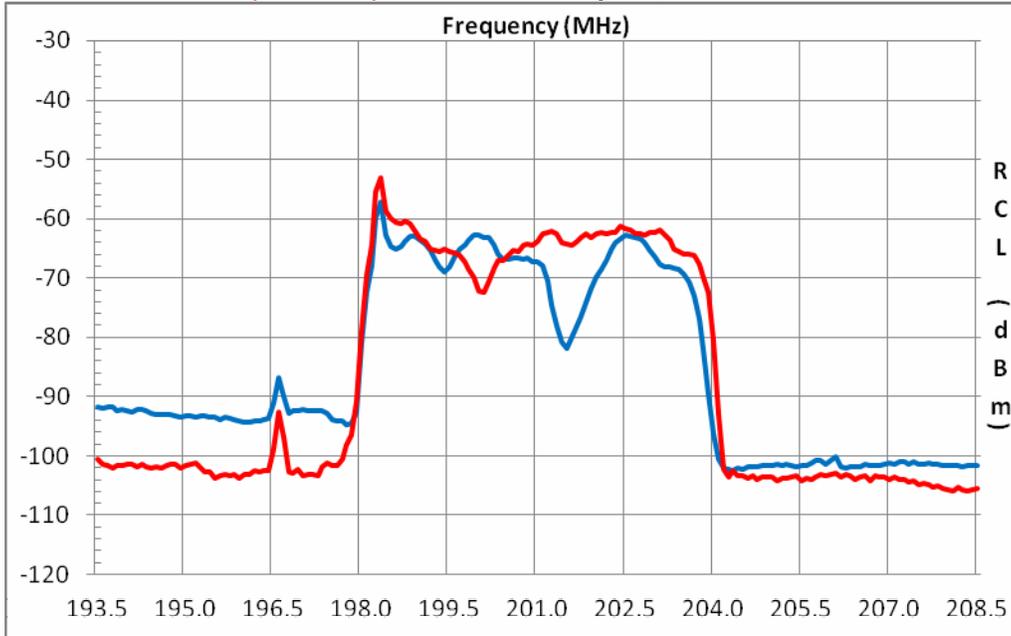
N 35° 48' 11.8"  
W 078° 38' 17.3"

Ch. 11: 155°(SSE) 11.3 miles

**Peak on Ch. 11** Terk aerials in "V" position, on mantle right pointed back 000 002

**Before (10/13/09) -57.12 dBm on pilot, 72% on tuner**

**After (11/04/09) -53.14 dBm on pilot, 94% on tuner**



**Location**

**GPS Coordinates Vector to Transmitter**

15 McGee, Hwy 40 & 210  
Old Roberts Rd. & N. Coats Rd  
Remax & space for lease

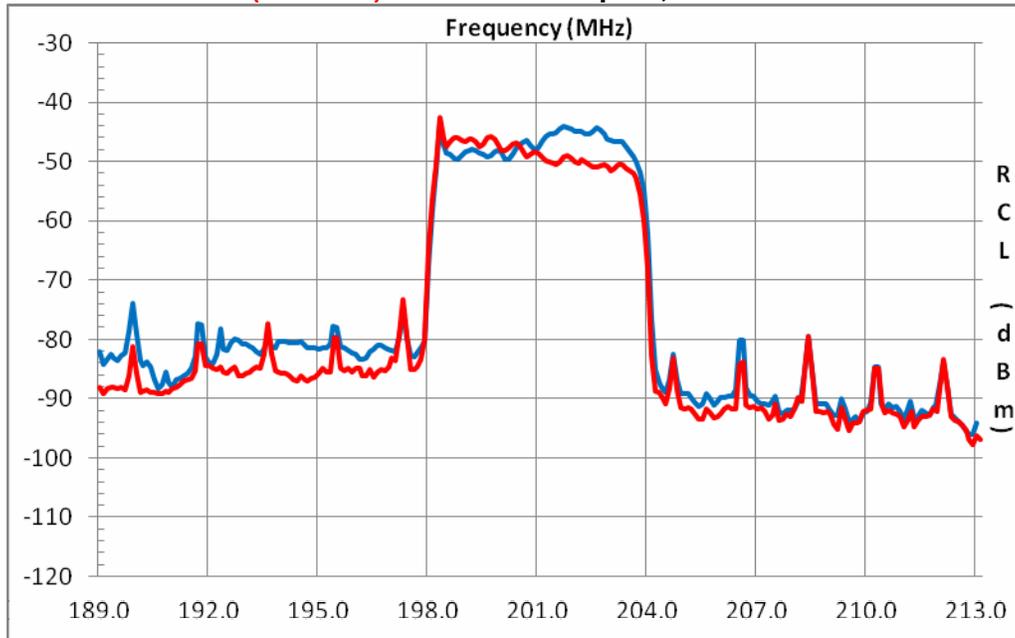
N 35° 31' 03.1"  
W 078° 33' 10.0"

Ch. 11: 017°(N) 10.5 miles  
Ch. 10: 108°(E) 66.2 miles  
Ch. 12: 121°(E) 74.4 miles

**Peak on Ch. 11** Terk aerials in horizontal position, on 30 foot mast 000 001

**Before (10/9/09) -43.10dBm on pilot, 97% on tuner**

**After (01/13/10) -42.65 dBm on pilot, 92% on tuner**



**Location**

**GPS Coordinates Vector to Transmitter**

16 Newton Grove, I-40 exit 341

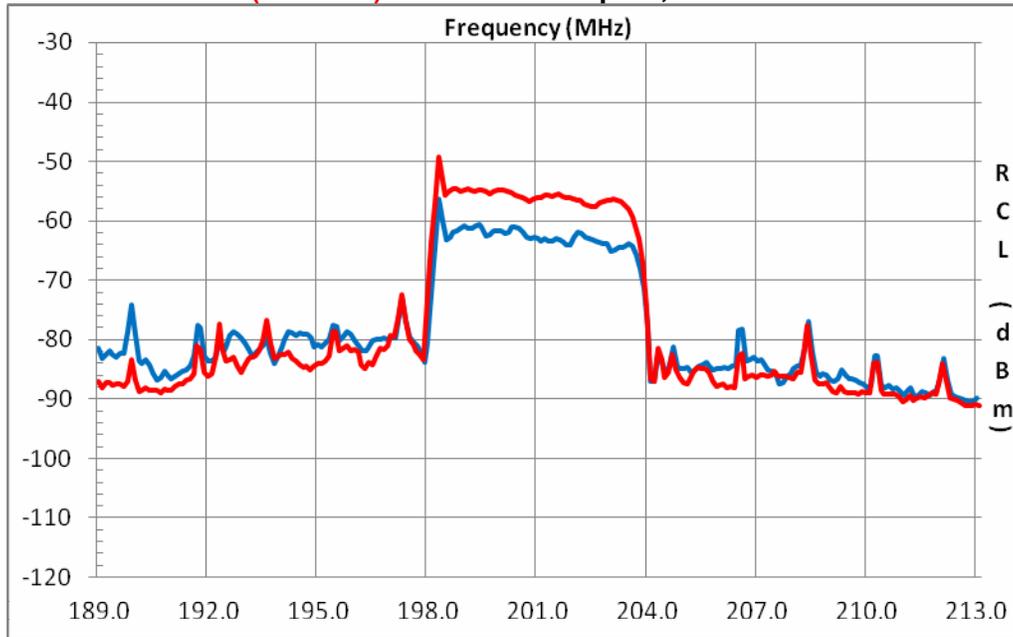
N 35° 14' 59.7"  
W 078° 22' 20.1"

Ch. 11: 352°(N) 30.1 miles  
Ch. 10: 90°(E) 55.9 miles  
Ch. 12: 108°(E) 59.5 miles

**Peak on Ch. 11** Terk aerials in horizontal position, on 30 foot mast 000 002

**Before (10/9/09) -56.26 dBm on pilot, 62% on tuner**

**After (01/13/10) -49.19 dBm on pilot, 87% on tuner**



**Location**

**GPS Coordinates Vector to Transmitter**

17 Spivey's Corner, Fire Dept.

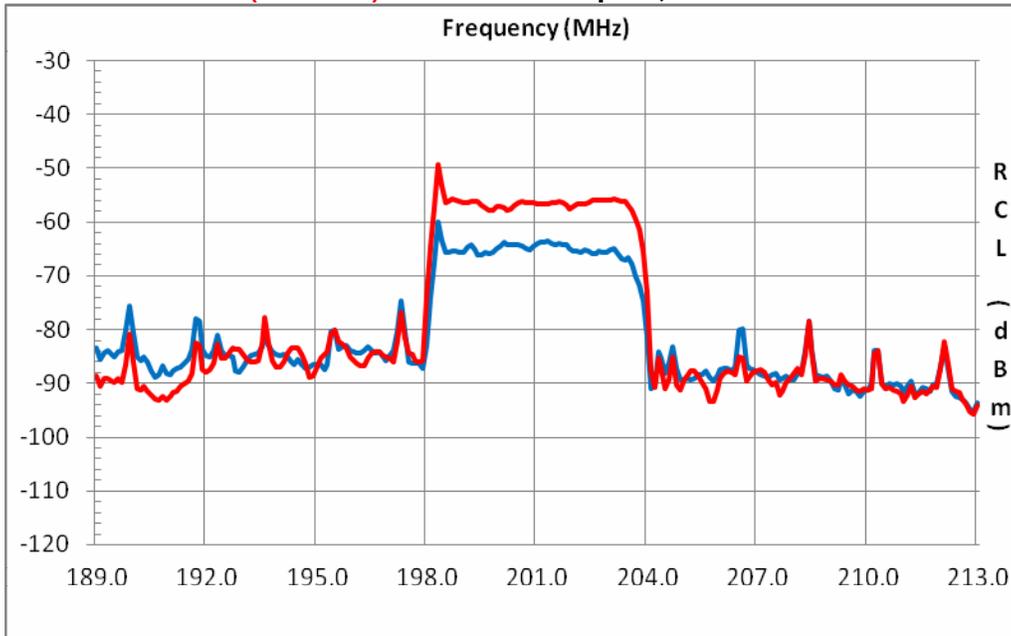
N 35° 11' 49.3"  
W 078° 29' 02.0"

Ch. 11: 005°(N) 32.5 miles  
Ch. 10: 088°(E) 62.7 miles  
Ch. 12: 104°(E) 65.3 miles

**Peak on Ch. 11** Terk aerials in horizontal position, on 30 foot mast 000 003

**Before (10/9/09) -59.93dBm on pilot, 56% on tuner**

**After (01/13/10) -49.17 dBm on pilot, 92% on tuner**



**Location**

**GPS Coordinates Vector to Transmitter**

18 Four Oaks, I-95 exit 87

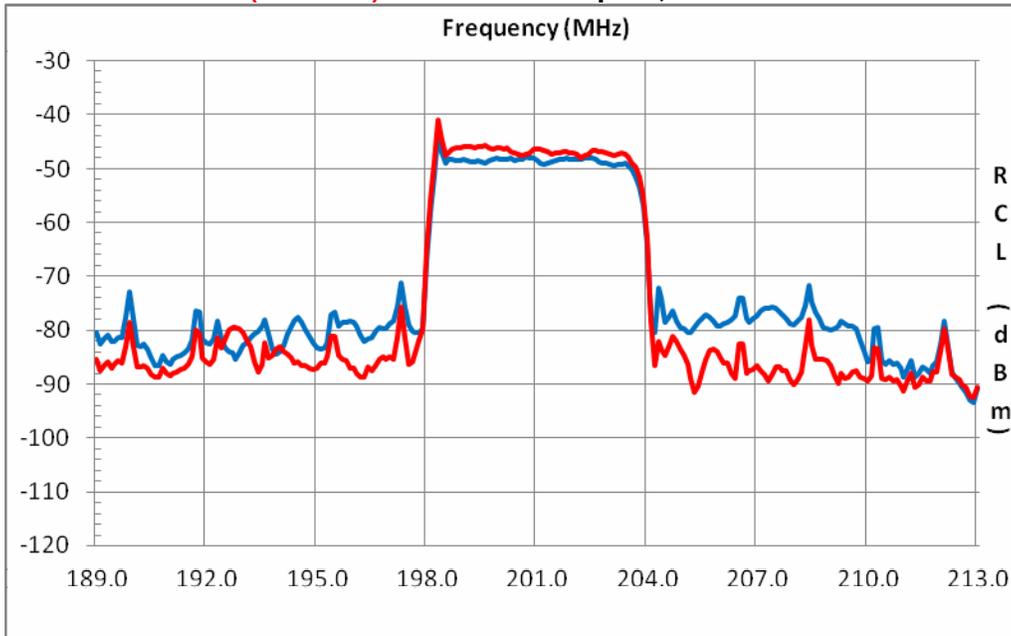
N 35° 26' 28.4"  
W 078° 25' 20.8"

Ch. 11: 348°(N) 16.7 miles  
Ch. 10: 104°(E) 58.3 miles  
Ch. 12: 119°(E) 65.6 miles

**Peak on Ch. 11** Terk aerials in horizontal position, on 30 foot mast 000 003

**Before (10/9/09) -43.32dBm on pilot, 95% on tuner**

**After (11/03/09) -41.02 dBm on pilot, 97% on tuner**



**Location**

**GPS Coordinates Vector to Transmitter**

19 Smithfield  
Hwy 70, Collins Inc.

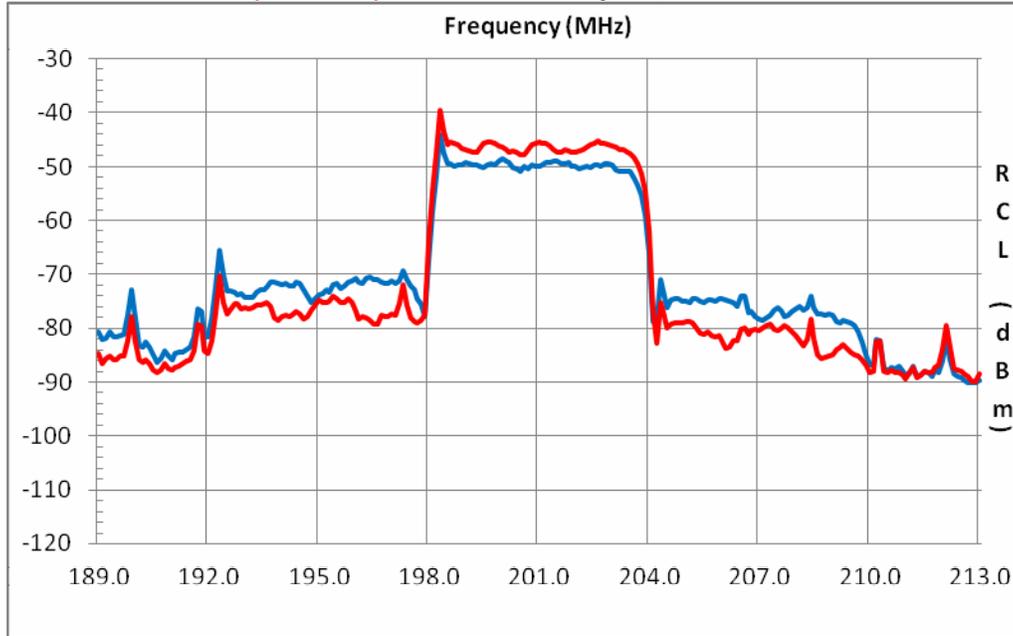
N 35° 29' 27.0"  
W 078° 16' 09.6"

Ch. 11: 319°(NW) 18.9 miles  
Ch. 10: 109°(SEE) 50.2 miles  
Ch. 12: 126°(SE) 59.1 miles

**Peak on Ch. 11** Terk aerials in horizontal position, on 30 foot mast 000 003

**Before (10/9/09) -43.91 dBm on pilot, 95% on tuner**

**After (11/05/09) -39.48 dBm on pilot, 97% on tuner**



**Location**

**GPS Coordinates Vector to Transmitter**

20 Kenly, I-85

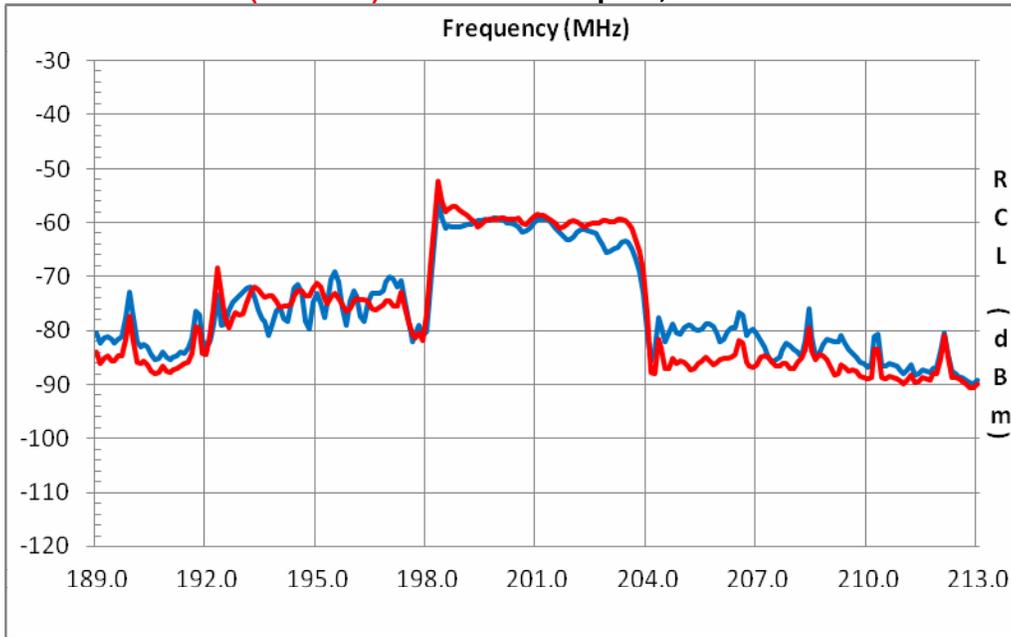
N 35° 35' 33.8"  
W 078° 07' 50.9"

Ch. 11: 292°(NWW) 22.9 miles  
Ch. 10: 120°(SEE) 44.4 miles  
Ch. 12: 136°(SE) 56.1 miles

**Peak on Ch. 11** Terk aerials in horizontal position, on 30 foot mast 000 003

**Before (10/9/09) -55.39 dBm on pilot, 65% on tuner**

**After (11/03/09) -52.30 dBm on pilot, 87% on tuner**



**Location**

**GPS Coordinates Vector to Transmitter**

21 Bailey, Hwy 264&581

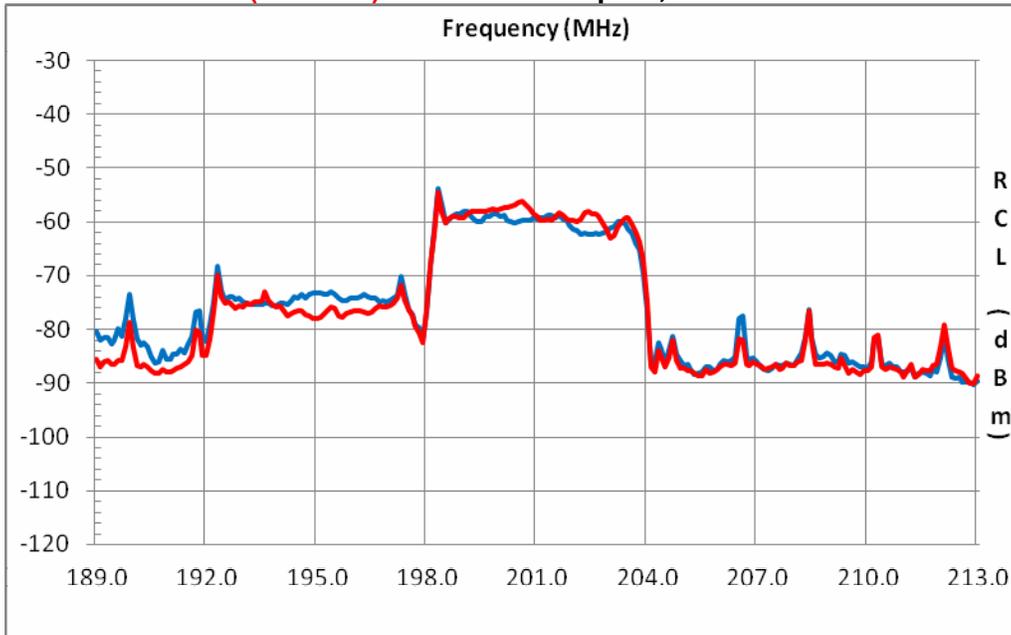
N 35° 47' 18.9"  
W 078° 07' 01.3"

Ch. 11: 259°(W) 24.5 miles  
Ch. 10: 135°(SE) 50.1 miles  
Ch. 12: 146°(SE) 64.5 miles

**Peak on Ch. 11** Terk aerials in horizontal position, on 30 foot mast 000 003

**Before (10/9/09) -53.78 dBm on pilot, 69% on tuner**

**After (11/13/09) -54.49 dBm on pilot, 75% on tuner**



**Location**

**GPS Coordinates Vector to Transmitter**

22 Middlesex, Hwy 264&231

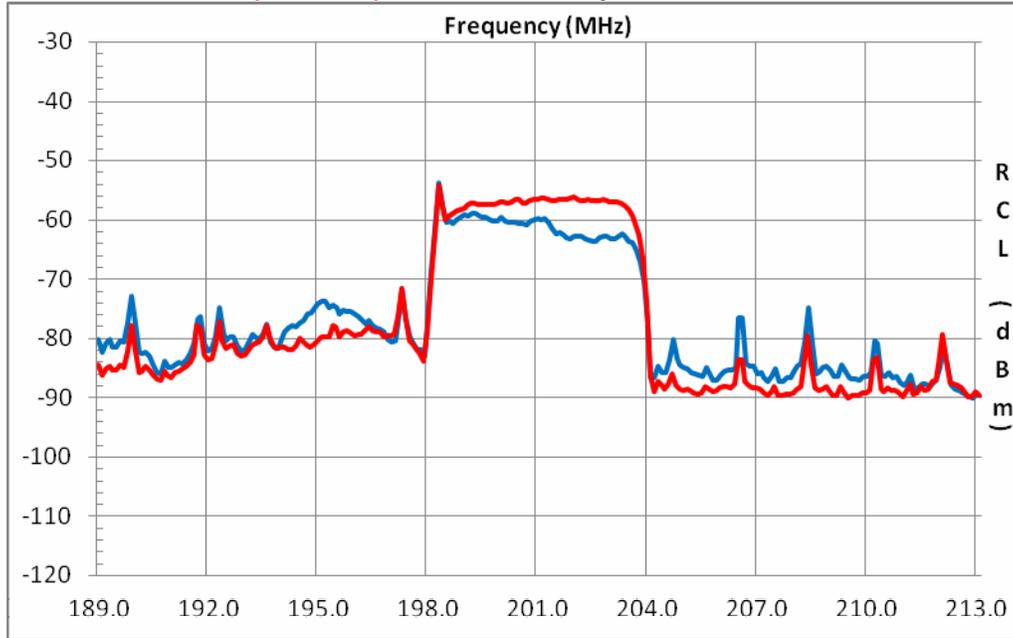
N 35° 48' 02.6"  
W 078° 11' 23.2"

Ch. 11: 253°(SW) 21.0 miles  
Ch. 10: 133°(SE) 53.9 miles  
Ch. 12: 144°(SE) 68.0 miles

**Peak on Ch. 11** Terk aerials in horizontal position, on 30 foot mast 000 002

**Before (10/9/09) -53.87 dBm on pilot, 62% on tuner**

**After (11/04/09) -54.29 dBm on pilot, 77% on tuner**



**Location**

**GPS Coordinates Vector to Transmitter**

23 Goldsboro  
Bojangles 12 miles from Gboro

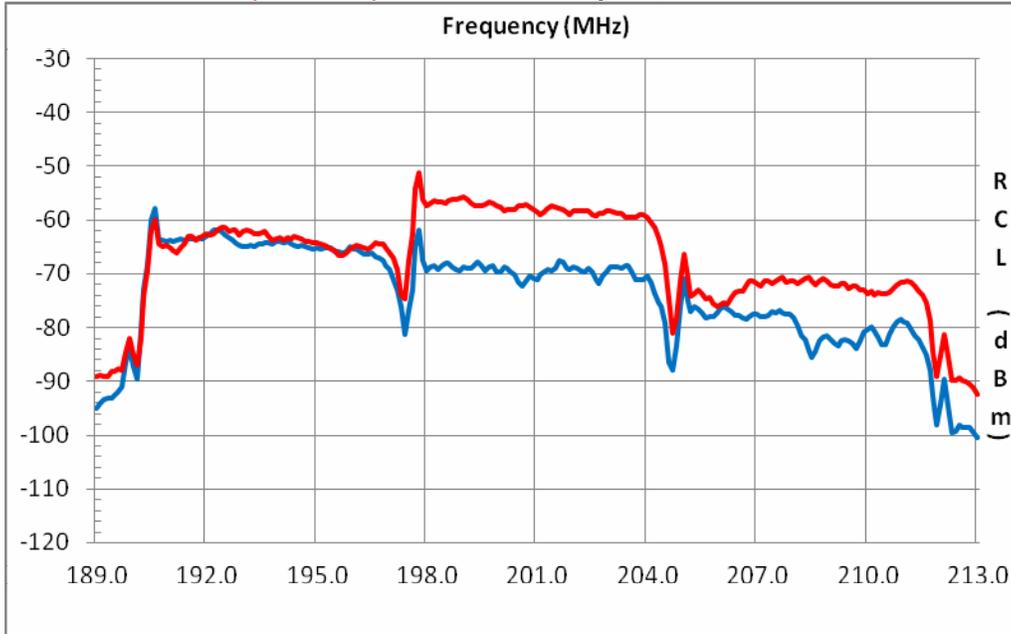
N 35° 20' 19.6"  
W 78° 01' 53.8"

Ch. 11: 319° 35.9 miles  
Ch. 10: 96° 36.1 miles  
Ch. 12: 121° 42.5 miles

**Peak on Ch. 11** Terk aerials in horizontal position, on 30 foot mast 002 003

**Before (10/12/09) -62.02 dBm on pilot, 71% on tuner**

**After (01/13/10) -51.26 dBm on pilot, 89% on tuner**



**Location**

**GPS Coordinates Vector to Transmitter**

24 Wilson Mills  
Across from DOT

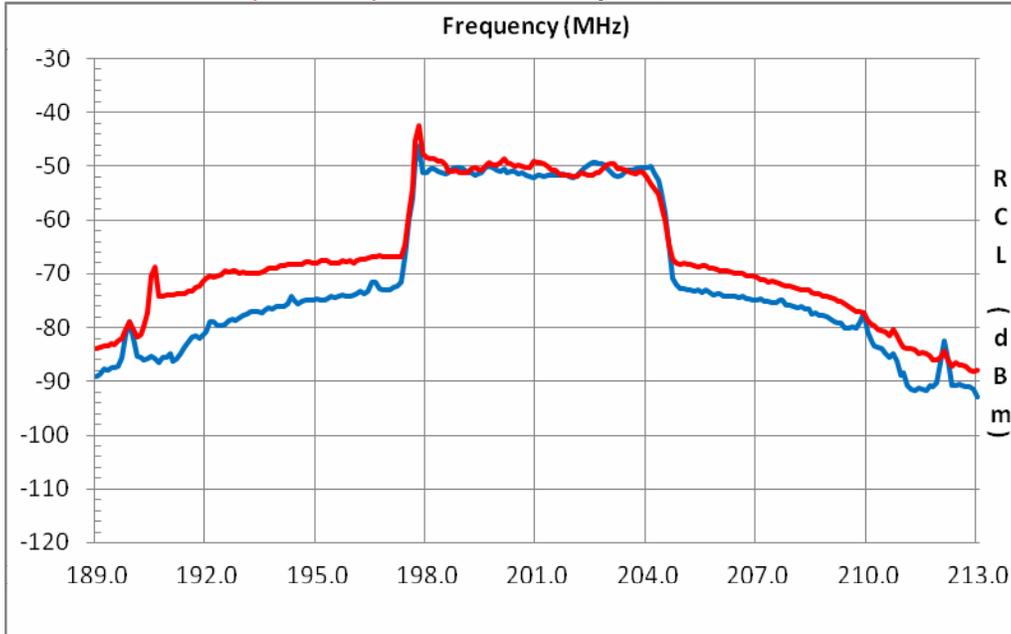
N 35° 35' 00.3"  
W 078° 21' 21.5"

Ch. 11: 310° 11.2 miles  
Ch. 10: 114° 56.3 miles  
Ch. 12: 129° 66.4 miles

**Peak on Ch. 11** Terk aerials in horizontal position, on 30 foot mast 000 003

**Before (10/12/09) -46.29 dBm on pilot, 97% on tuner**

**After (11/05/09) -42.44 dBm on pilot, 92% on tuner**



**Location**

**GPS Coordinates Vector to Transmitter**

25 Wilson  
Hwy 301, Old Fairgrounds

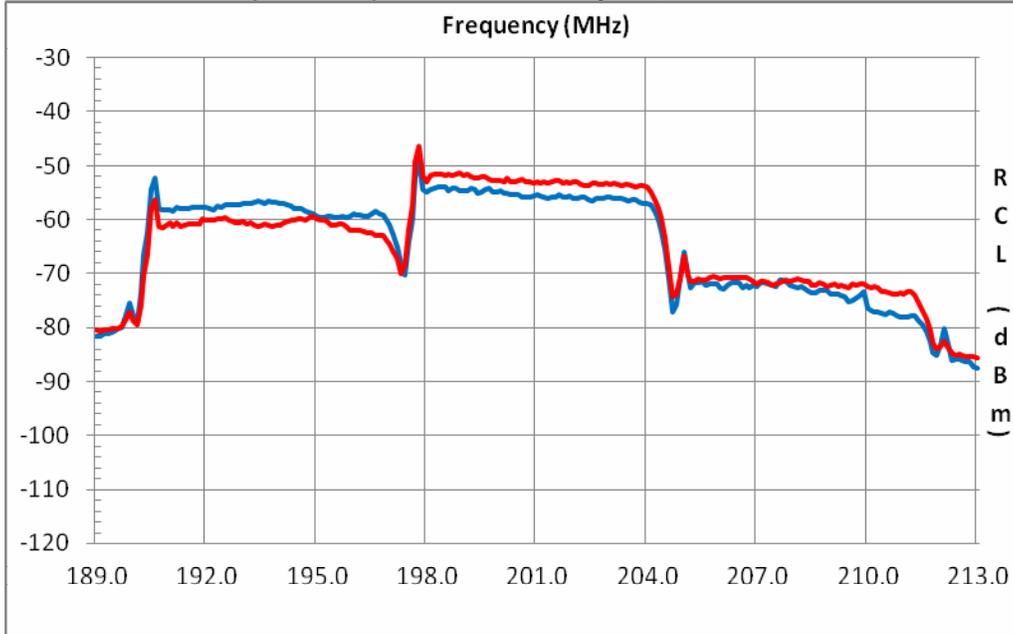
N 35° 42' 00.0"  
W 077° 55' 54.8'

Ch. 11: 276°(W) 33.5 miles  
Ch. 10: 137°(SE) 38.1 miles  
Ch. 12: 150°(SE) 53.1 miles

**Peak on Ch. 11** Terk aerials in horizontal position, on 30 foot mast 000 003

**Before (10/14/09) -49.16 dBm on pilot, 85% on tuner**

**After (11/03/09) -46.35 dBm on pilot, 97% on tuner**



**Location**

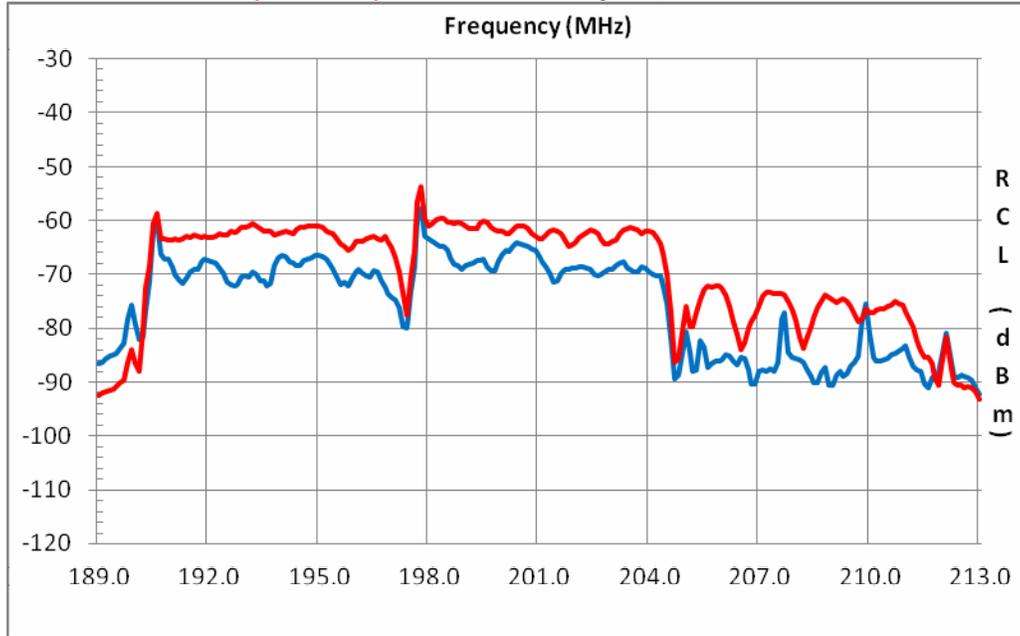
**GPS Coordinates Vector to Transmitter**

26 Black Creek  
W. Center & Privette

N 35° 38' 09.5"  
W 077° 56' 00.1'

Ch. 11: 283°(NWW) 33.4 miles  
Ch. 10: 131°(SE) 35.7 miles  
Ch. 12: 147°(SE) 49.8 miles

**Peak on Ch. 11** Terk aerials in horizontal position, on 30 foot mast 000 003  
**Before (10/14/09) -57.63 dBm on pilot, no picture on tuner**  
**After (01/13/10) -53.71 dBm on pilot, 85% on tuner**



**Location**

**GPS Coordinates Vector to Transmitter**

27 Fremont  
Branch & Wilson

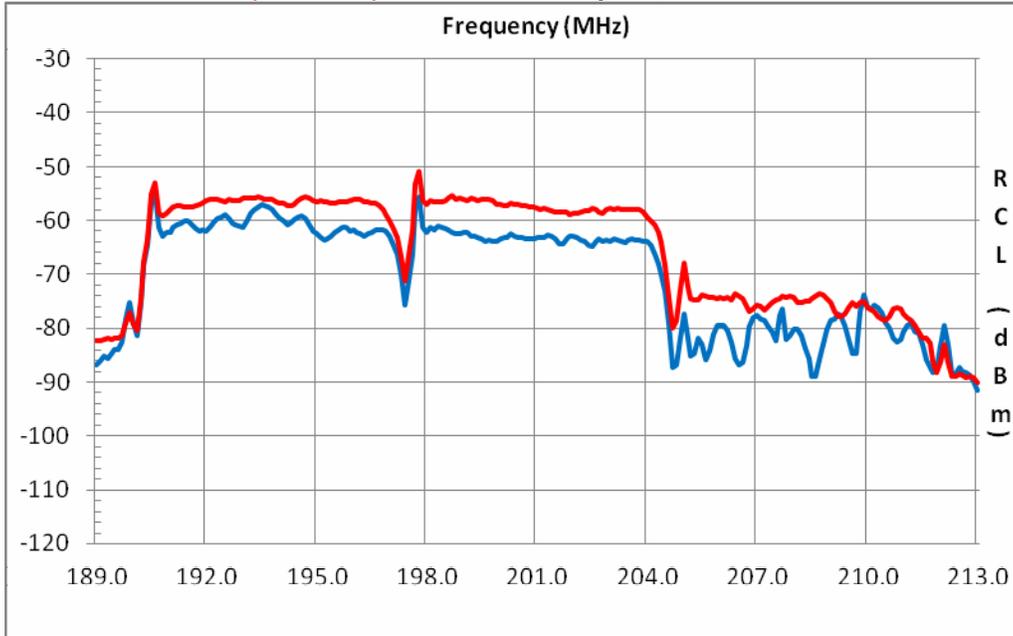
N 35° 32' 26.7"  
W 077° 58' 38.3"

Ch. 11: 295°(NWW) 32.1 miles  
Ch. 10: 119°(SEE) 35.1 miles  
Ch. 12: 139°(SE) 47.1 miles

**Peak on Ch. 11** Terk aerials in horizontal position, on 30 foot mast 000 003

**Before (10/14/09) -55.66 dBm on pilot, 54% on tuner**

**After (11/03/09) -50.81 dBm on pilot, 87% on tuner**



**Location**

**GPS Coordinates Vector to Transmitter**

28 Clinton  
Hwy 701

N 35° 01' 00.5"  
W 078° 19' 33.8"

Ch. 11: 355°(N) 46.3 miles  
Ch. 10: 074°(NEE) 58.0 miles  
Ch. 12: 092°(E) 56.4 miles

**Peak on Ch. 11** Terk aerials in horizontal position, on 30 foot mast 000 006

**Before (10/14/09) -64.97 dBm on pilot, no picture on tuner**

**After (01/13/10) -65.44 dBm on pilot, no picture on tuner**

