ORIGINAL

SKADDEN, ARPS, SLATE, MEAGHER & FLOM LLP

1440 NEW YORK AVENUE, N.W.
WASHINGTON, D.C. 20005-2111

TEL: (202) 371-7000
FAX: (202) 393-5760

FIRM/AFFILIATE OFFICES
BOSTON
CHICAGO
HOUSTON
LOS ANGELES
NEWARK
NEW YORK
PALO ALTO
SAN FRANCISCO
WILMINGTON

BEIJING
BRUSSELS
FRANKFURT
HONG KONG
LONDON
MOSCOW
PARIS
SINGAPORE
SYDNEY
TOKYO
TORONTO

DIRECT DIAL
202-371-7604
DIRECT FAX
202-371-7475
EMAIL ADDRESS
BWEIMER@SKADDEN.COM

RECEIVED
DEC - 1 1999
FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

EX PARTE OR LATE FILED

December 1, 1999

Magalie Roman Salas, Secretary
Federal Communications Commission
445 Twelfth Street, S.W.
Washington, D.C. 20554

Re: ***Ex Parte* Meeting of Northpoint Technology, Ltd.**
ET Docket No. 98-206, RM-9147, RM-9245

Dear Ms. Salas:

In accordance with Section 1.1206 of the Commission's rules (47 CFR § 1.1206), I hereby notify you that yesterday, November 30, 1999, Sophia Collier, Chula Reynolds, and Habib Riazi of Northpoint Technology, Ltd. and Toni Cook Bush and I of this firm met with the following members of the Commission's staff: Robert Calaff (WTB), Thomas Derenge (OET), Bruce Franca (OET), Dale Hatfield (OET), Julius Knapp (OET), Geraldine Matise (OET), and Thomas Stanley (WTB). At the meeting, we discussed Northpoint's ability to share spectrum in the Ku-band with NGSO FSS systems. In this regard, the attached hand-out was distributed to all those present at the meeting. Northpoint also discussed the results of its very successful testing in the Washington, D.C. area. Finally, Northpoint directed the attention of the participants in the meeting to pages 12-15 from Northpoint's Progress Report Regarding Experimental Authorization WA2XMY, dated October 13, 1999, to clarify certain questions asked by Commission staff members. Copies of the referenced pages are attached hereto.

No. of Copies rec'd 0+1
List ABCDE

An original and one copy of this letter are submitted for inclusion in the public record for the above-captioned proceedings. Please direct any questions concerning this submission to the undersigned.

Sincerely,

Brian Weimer
Counsel for Northpoint
Technology, Ltd.

cc: Robert Calaff (WTB)
Thomas Derenge (OET)
Bruce Franca (OET)
Dale Hatfield (OET)
Julius Knapp (OET)
Geraldine Matise (OET)
Thomas Stanley (WTB).

Most NGSOs are Compatible with Northpoint Exactly as Proposed

- Five of the seven proposed NGSO systems can operate co-channel with Northpoint with no impairment to or from Northpoint
  - MEO systems: Boeing (2), Teledesic
  - HEO systems: Virgo, Denali
- No PFD limit changes are needed
- No on-going coordination is required
- Localized shielding of the Northpoint transmitter can make even rooftop co-location possible for four of the systems

Skybridge

- Northpoint is sufficiently compatible with Skybridge and any other low elevation systems for mutually beneficial co-channel deployment
- Effective strategies exist for 100% coverage to be achieved
- If both are deployed at the provisional PFD limits:
  - Northpoint retains 73 - 90% of its service area
    - 100% coverage achieved with additional cells
  - Skybridge retains 92% of its service area
    - 100% coverage achieved with no loss of total service area by using frequencies outside of the 12.2 - 12.7 band (Frequency diversity)

Northpoint and NGSO Co-Sharing Does Not Impair DBS

- Taken together, the total increase in noise from the full deployment of NGSO (at current PFD limits) and Northpoint will not exceed the larger of:
  - 10% increase in DBS unavailability or
  - 5 minutes per month
- Northpoint's contribution to increased unavailability is significantly less than the NGSOs because Northpoint's average C/I ratio exceeds 41.6, a level at which the increase in DBS unavailability is less than .05%

Band Segmentation Strategy to Accommodate All NGSO

- Eight NGSO systems have applied to operate in the 11.7 - 12.7 band
- Some of the systems are incompatible with one another; ITU study groups have determined that the Aggregate PFD limits can only accommodate 3 - 5 systems
- One solution is band segmentation which will also benefit Northpoint
  - 11. 7 - 12.2: Lower elevations systems
  - 12.2 -12.7: Higher elevation systems; Northpoint
- Benefit to the United States: Highest total spectrum capacity achieved

Progress Report

WA2XMY

Northpoint - DBS Compatibility Tests

Washington, D.C.

October, 1999

Carmen Tawil, P.E., Diversified Communication Engineering, Inc.
Dr. Darrell Word, P.E., D.R. Word Associates
Robert Combs, Broadwave USA

STATE OF TEXAS
CARMEN ARMISTEAD TAWIL
66393
REGISTERED
PROFESSIONAL ENGINEER

STATE OF TEXAS
DARRELL R. WORD
48184
REGISTERED
PROFESSIONAL ENGINEER

No Statistical Difference Between Northpoint "On" and "Off" Conditions

As previously described, the inherent spatial/temporal variation in the pointer indicator is approximately 3-5 counts. This is normal and reflects a robust DBS system. The average change, when the Northpoint transmitter was turned on, was found to be less than one count. Therefore, the expected normal variation in DBS operation is greater than the change observed when the Northpoint transmitter was turned on. In fact, when a standard test for statistical difference was applied, it was found that the "on" condition is not statistically different than the "off" condition. Using Student's *t* test for statistical significance reveals that a statistician would find no difference between the Northpoint "off" and Northpoint "on" conditions at a 95% confidence level.

Statistical Methods Explained

The *t*-test was used to assess whether variations noted between Northpoint "off" and Northpoint "on" are statistically significant. That is, could the difference in sample means be attributed to Northpoint with a high degree of confidence given the inherent variances within the DBS system? In general, it was found that the difference could not be attributed to Northpoint.

A *t*-test is a tool used to identify the probability of there being a difference between two samples of a population. A sample of a population can only represent that population within a certain margin of error depending upon the sample size and the variance of the sample. The *t*-test is based on central limit theorem and gives the probability that the average of a sample lies within a specific interval around the average for an entire population.

In the two sample *t*-test, two sets of samples are compared, and assumed to be from the same population, which is assumed to have a normal distribution, with mean η and variance σ^2. The two sets of samples have means y_a and y_b, n_a and n_b number of samples, and sample variances s_a and s_b, where

$$s_a^2 = \frac{\sum (y_i - y_a)^2}{n_a - 1},$$

and similarly for s_b. The quantity $t = (y-\eta)/s$ has a known distribution, referred to as the *t* distribution. The *t* distribution approaches the normal distribution as the sample size increases. The probability that $y_a = y_b$ can then be estimated by comparing the value for *t* with the known *t* distribution for that sample size. This common test is implemented in commercial software statistical systems.[7]

As an example of how the normal DBS operational variation can affect the SSP readings, at some of the near-in sites, a deflection in the SSP was observed on some days with Northpoint on, and not on others. At Site 7 (Arlington Cemetery) there was a deflection

[7] Minitab was used to generate the statistics in this report.

on DirecTV on one day of 5 counts, and on another day of 2.2 counts, and on the third measurement day, no deflection was seen. Similar results were noted at another close-in site, the Federal Construction site, where on one day there was a positive change of 2.4 counts and another day, no change was observed. In about 40% of measurements, the SSP showed an increase when Northpoint was turned on.

While, at certain sites, insignificant SSP deflections of 1-5 counts were observed, overall the data show no statistical difference, even in the part of the service area closest to the transmitter. At a 95% confidence interval, there is no statistical difference between Northpoint "on" and Northpoint "off" conditions. This analysis reflects the data as a whole and represents the average condition found.

Table 4. Results of *t*-test for Statistical Difference of SSP Readings

System	Distance of Data	Average Delta	Statistical Significance of Delta	95% Confidence Interval (Single-Sided)	*t*	P	DF
DTV101	Half-Mile	-1.62	Insignificant	2.77	1.21	0.24	25
DTV101	First Mile	-1.46	Insignificant	1.76	1.68	0.1	45
DTV101	Beyond First Mile	+0.91	Insignificant	2.38	-0.79	0.44	21
DTV101	All Data	-0.70	Insignificant	1.40	0.99	0.33	69
ES 61.5	Half-Mile	-0.85	Insignificant	3.05	0.57	0.57	27
ES 61.5	First Mile	-0.52	Insignificant	1.84	0.57	0.57	49
ES 61.5	Beyond First Mile	+0.05	Insignificant	4.85	-0.02	0.98	19
ES 61.5	All Data	-0.35	Insignificant	1.93	0.36	0.72	71
ES 119	Half-Mile	-0.32	Insignificant	2.33	0.28	0.78	27
ES 119	First Mile	-0.46	Insignificant	2.23	0.42	0.68	49
ES 119	Beyond First Mile	+0.30	Insignificant	4.60	-0.14	0.89	21
ES 119	All Data	-0.23	Insignificant	2.04	0.22	0.83	73

The following figures show the results of the SSP *t*-test for statistical significance. The data for each DBS system are presented for four cases:

1. The data taken within the first half-mile of a transmitter - representing 0.25% of the Northpoint service area.
2. Data taken within the first mile of a transmitter - representing 1.0% of the Northpoint service area.
3. Data taken beyond the first mile of a transmitter - representing 99% of the Northpoint service area.
4. All data taken.

Two values for each case are shown; the average of the observations within that zone for each of the Northpoint "on" and "off" conditions. The vertical bars represent the confidence intervals given by the *t*-test, or the range of averages that can be expected to be found 95% of the time. The scale to the right shows the number of samples used in that test. In all cases, the measured average with the Northpoint transmitter "on" falls within the range of expected variation, with a 95% confidence level. These observations support the finding that Northpoint has less impact on DBS than the normal variation of DBS's own performance.

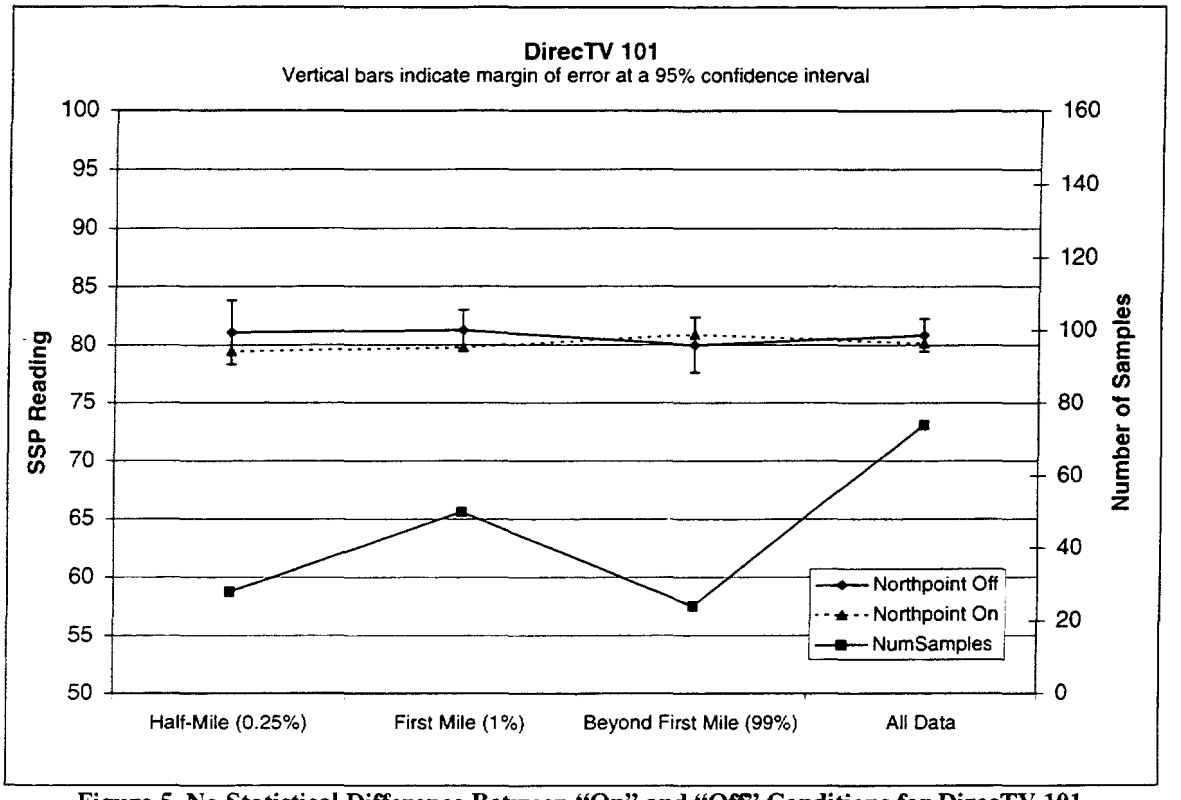

Figure 5. No Statistical Difference Between "On" and "Off" Conditions for DirecTV 101

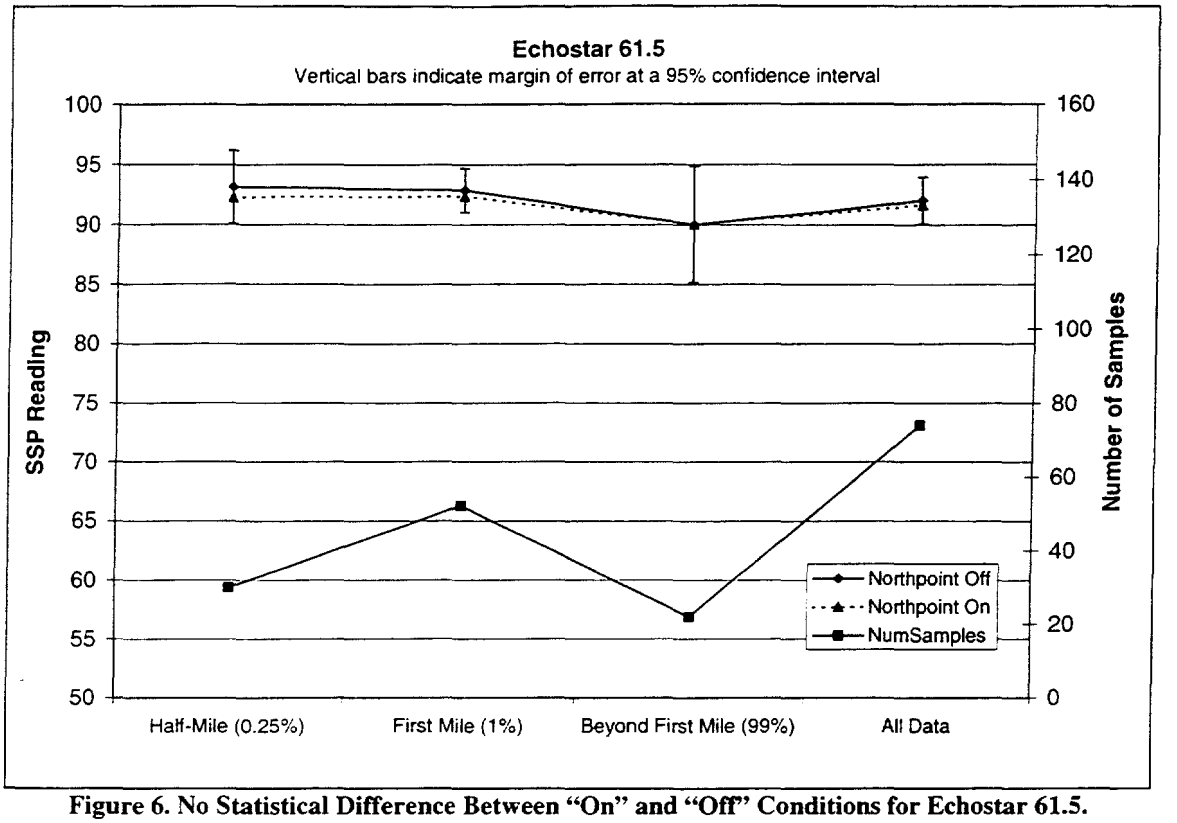

Figure 6. No Statistical Difference Between "On" and "Off" Conditions for Echostar 61.5.

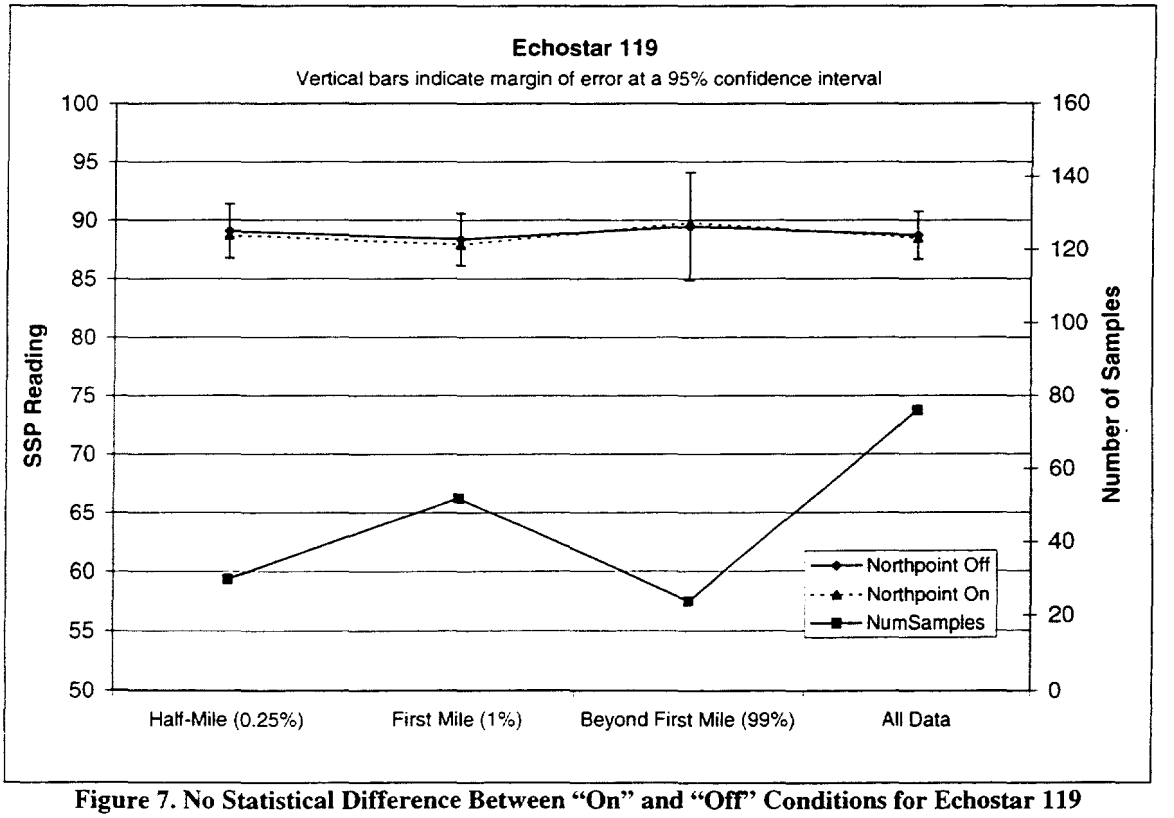

Figure 7. No Statistical Difference Between "On" and "Off" Conditions for Echostar 119