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August 14, 2001

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AUG 14 2001

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

VIA HAND DELIVERY **EX PARTE**

Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: Ex Parte Communication in ET Docket No. 98-206; RM-9147; RM-9245; Applications of Broadwave USA et al., PDC Broadband Corporation, and Satellite Receivers, Ltd., to provide a fixed service in the 12.2-12.7 GHz Band; Requests of Broadwave USA et al. (DA 99-494), PDC Broadband Corporation (DA 00-1841), and Satellite Receivers, Ltd. (DA 00-2134) for Waiver of Part 101 Rules.

Dear Ms. Salas:

Antoinette Cook Bush of Northpoint Technology, Ltd. ("Northpoint") today sent via email the attached *Northpoint Technology – DBS Compatibility Experimental Testing Plan, Phase I Draft* to Charles Iseman, Office of Engineering and Technology.

Eighteen copies of this letter are enclosed – two for inclusion in each of the above-referenced files. Please contact me if you have any questions.

Yours sincerely,

J. C. Rozendaal
Counsel for Northpoint Technology, Ltd.

cc: Charles Iseman, OET

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Northpoint Technology – DBS Compatibility Experimental Testing Plan

Phase I Draft

Submitted by Diversified Communication Engineering, Inc.
On Behalf of Northpoint Technology
November 5, 1998

Northpoint Technology – DBS Compatibility Test Plan 30 Oct 1998

Plan For Initial Experiments in the Test Service Area in Austin, Texas
(Working DRAFT Copy)

Mission Statement:

To perform a series of controlled and well defined experiments in order to document the level of effectiveness of the Northpoint system in achieving co-channel use of the 12.2 – 12.7 GHz band with Direct Broadcast Satellite (DBS) systems. The data thus obtained will also be of use toward further development of the Northpoint system.

Plan Summary:

This document outlines a plan for experiments in which a test service area is illuminated by a terrestrial Northpoint transmitter while a series of measurements and observations are made at several selected field test sites in the service area. At each field test site, separate DBS receiver systems will be set up to receive and display signals from each DBS satellite that is broadcasting and which is available to the Austin area and operated by DirecTV, USSB and EchoStar. An additional receiver system will be set up to receive and display the Northpoint signal. A calibrated test set with a RF spectrum analyzer will be used to observe the related microwave signals, the Northpoint signal and the satellite signals. The signal powers and frequency spectra will be measured. Also, at some selected sites, the test set will be used to observe and measure the signal power distribution vs. pointing angle of the receive antenna at the DBS frequency bands related to the tests.

For each field test site, the DBS satellite receivers will be monitored for signal quality and evidence of interference by the Northpoint signal while observing the Northpoint signal power level at the site. Likewise, the Northpoint received signal will be monitored for quality and evidence of any interference.

For the planned test service area, the Northpoint transmitter will be located 270 feet above the ground on a suitable antenna site assessable to the present DCE headquarters at Congress Avenue and First Street and pointed horizontally southward, covering a region of Austin ranging up to 10 miles to the south. Initial transmitter settings will be made on the basis of earlier test results;, thereafter, initial measurements in this present test will be conducted to determine any necessary adjustments in transmitter power and/or pitch angle that might be desirable for optimum range without DBS interference.

While the measurements and observations summarized above are generally planned for each field site, it is expected that some aspects of the test plan will be derived dynamically as the work proceeds and on the basis of the observed results. It is anticipated that 20 to 30 test sites will be measured in the service area and will be distributed to cover an appropriate range of representative conditions in the signals and the site environments. Special attention will be paid to choosing several sites that theoretically represent the worst case scenario for multi-path conditions. In addition,

some test sites will be chosen which are marginal in terms of ability to adequately receive the DBS satellites. In particular, tests will be conducted in areas where the line of sight from the satellite is partially blocked by buildings, foliage or other terrain features.

At the beginning of the test project, some special work will be done in the field zone in the immediate vicinity of the Northpoint transmitter ('Mitigation Zone') to avoid interference with any DBS systems that exist in this zone, where the signal power density is large and more vertically directed.

Only two or three such DBS systems are expected in the Mitigation Zone.

The following is an outline of the test project tasks.

(1) Preparation for field operations (equipment, procedures, documentation, staff).

(2) Transmitter set up and calibration.

(3) Mitigation zone work.

(4) Initial field calibration experiments.

(5) Field site measurements and observations.

(6) Data analysis and report preparation.

Plan Details:

(1) Preparation for field operations.

An early task of the project is to prepare the equipment, procedures, documentation, and staffing for the field operations. This task is underway at the time of this writing. The DBS receivers and other test and measurement instrumentation will be organized and installed in a van for field transportation and outfitted for ready deployment at each test site. The equipment will include the following items:

a. DBS antenna and receiver system for each satellite.
b. Terrestrial receive antenna system w/Tandberg MPEG2 decoder.
c. Calibrated test set with a precision antenna.
d. Spectrum analyzer, model HP8563E or equivalent with an HPIB interface. A camera or plotter will be used to record the spectral data.
e. GPS receiver to record the site positions.
f. An optical transit to be used as a pointing reference for antenna alignment.
g. Other supporting test equipment will be available as required and some additional instrumentation might be employed on conditions as discussed in Task (5).

A portable scissor lift will be used for the field antenna platform, to be positioned approximately 15 feet above ground level (AGL) or at other elevations as required by site conditions. All antenna measurements will be made from the same platform. A van with internal workspace will be used to house the instruments and the operators, while the platform is manned for manual positioning of the antennas as required.

Manual check list and field log forms will be prepared and used to log the time, site conditions, test conditions and the data and observations for each field site.

Some initial calibration experiments (not involving the Northpoint transmitter signal) will be done on the field equipment prior to start of the actual field measurements. This will include determination of calibration factors (including cable attenuation factors, antenna calibrations, etc.). A general equipment check out will be done to assure operation as expected and to refine procedures. A synthesizer and power meter will be used as a primary standard to calibrate the test set. A further calibration phase will be done at the start of field operations while the Northpoint transmitter is in operation, as described in Task (4).

(2) Transmitter set up and calibration.

The Northpoint transmitter will be installed on the suitable antenna site assessable to DCE office with the antenna located approximately 270 feet AGL and pointed south with no beam tilt. Operation will be under Experimental License, call sign WA2XMY. The initial set up and calibration of the transmitter will be done prior to the start of the field measurements.

The transmitter and related equipment is comprised as follows:

a. A 1 Watt LNR transmitter with a digital encoder, QPSK modulation, and a Synthesizer / Up-converter with power level control.

b. Seavy Engineering custom horn antenna with 10 dB gain and with beam widths of 110 degrees horizontal and 17 degrees vertical.

c. Andrew EW127 wave guide with WR75 flanges.

d. Calibration equipment will consist of the following or equivalent units: Adapter for WR75 flange to N type connector; HP11692 Coupler; and HP436A power meter w/ 8481A sensor.

The transmitter will initially be set at 5 dBm output power, with 2.5 dB of line losses and a transmit antenna gain of 10 dB. This will result in an Effective Radiated Power (ERP) of 12.5 dBm, which was determined from earlier field tests to provide for optimal operation. Horizontal polarization will be used for the transmitted signal. The transmitter site will be manned during the field tests so that the transmitter adjustments

can be made as required and the signal can be turned on and off as required by the tests. Power adjustments and possibly some beam tilt (possible up-tilt of 5 degrees) might be made during initial stages of the field procedures.

The Northpoint transmitter will be driven by an encoder and synthesizer with the capability for adjustable bandwidth in steps of 1 MHz, up to 15 MHz maximum bandwidth. Most field site measurements will be conducted with a fixed signal bandwidth (8 MHz), while special tests will be done with a stepped sequence of bandwidths for two or three selected field sites. Also, the procedures will allow for additional measurements at bandwidths up to 24 MHz for selected sites in the event that this is desired by interested parties who wish to provide the encoder equipment for the test, as discussed further in Task (5).

(3) Mitigation zone work.

Once the Northpoint transmitter is installed and ready, mitigation efforts will first be done to avoid interference with DBS receiver stations in the service area near the Northpoint transmitter, which is referred to as the 'Mitigation Zone' and defined as the region in which special measures may need to be taken to avoid interference. The potential boundaries of the Mitigation Zone can be identified in terms of the ratio of the received DBS signal to the Northpoint terrestrial signal. Contour maps depicting Mitigation Zone ratios of 6 dB to 20 dB, for individual satellites and for composites for all satellites, were provided in an engineering study in support of the instant experimental license under which this test is being performed. The zone defined by the 6 dB contour lies within a few hundred feet of the transmitter site, and the zone defined by a 15 dB contour extends to less than 2000 feet from the transmitter site. An initial survey of the areas suggests that only one DBS receiver station (already shielded by a 12 story building) is present within the 6 dB zone, and perhaps 10 or less DBS receivers are present in the 15 dB zone. By the current expectations, interference is not likely to occur outside the 6 dB zone and therefore, relatively few, if any, receivers will be affected.

A public notice of the tests will be published, and the mitigation work will be done on an extemporaneous basis, where efforts required depend on the circumstances found to exist. Direct contact will be made with any affected DBS user, and it is expected that in cases of interference, the remedy will be to provide a shield from the Northpoint signal or to temporarily move the affected DBS antenna to an interference free location (e.g. behind a barrier or other obstruction).

(4) Initial field calibration experiments.

A special test and calibration site will be located at an intermediate distance from the Northpoint transmitter, outside the Mitigation Zone and in a region of relatively strong signal. At this test site, further calibration and cross check measurements will be made on the field equipment. This will include a measurement of the Northpoint signal power and spectrum with the test set to reconcile the readings against the theoretically expected power level at the site. Also, the signals for all antennas will be observed with the

spectrum analyzer, one at a time, while each antenna is directed toward the Northpoint transmitter and exposed to the same signal conditions. This will provide information to cross calibrate the antennas; and while this information is not essential, it allows the ability to reconcile and cross check signal measurements in situations where such an analysis becomes necessary. In addition, the background noise level for all systems will be observed while pointed toward the Northpoint transmitter while the transmitter is off.

As an additional experiment in this task, signals from all antennas will be observed with the antennas directed toward the Northpoint transmitter and with two roll orientations: first with the normal orientation and then with a roll of 90 degrees. While it is understood that the DBS antennas are circularly polarized and thus very little, if any, difference is expected to be observed, this test is intended to provide a measure of the antenna sensitivity vs. signal polarization. This calibration is non-essential to the test, but it provides information that can be useful in reconciling special situations.

Once this field test is done, the regular field test measurements will begin.

(5) Field site measurements and observations.

The following general procedure steps will be done at each test site except where deviations are indicated by the specific circumstances and observed results. The plan must allow for dynamic revision of the procedures as deemed necessary for the stated objective, and it is expected that some revisions will occur.

For initial experiments, special sites will be selected and measured for the purpose of assessing the suitability of the transmitter conditions. Both close and far range sites will be first tested in order to decide on the optimal transmitter power level and tilt angle. On the basis of this initial test, the transmitter conditions will be established and held constant during the remainder of the test, unless other field sites reveal a need for further changes in transmitter conditions, in which case the transmitter will be further adjusted. After establishment of optimal transmitter conditions, all field data will be measured (or scaled as required) to provide data for a constant transmitter condition.

Field site procedure at each selected site:

a. The Northpoint transmitter will be turned off during the initial site setup.

b. The DBS, Northpoint and test set antennas will be deployed on the scissor lift platform, elevated to a nominal 15 feet AGL. A GPS receiver will be placed on the platform and allowed to average over the measurement time and to determine the platform position. The platform position will also be located with respect to an identified local benchmark to allow for later re-occupation of the exact site or a verification of the site position.

c. The DBS satellite receiver systems will be setup to receive their respective satellites, and these signals will be monitored initially with no Northpoint signal while other

equipment is being set up. Signal quality and conditions will be noted.

d. The Northpoint receiver will be set up with the antenna pointing approximately toward the Northpoint transmitter and readied for reception when the transmitter is turned on.

e. The test set will be set up with the antenna pointing approximately toward the Northpoint transmitter and readied for measurement of the signal when the transmitter is turned on.

f. The Northpoint transmitter will then be turned on while observing the DBS system monitors for the satellite signals. The audio and video signal quality will be noted, as well as the occurrence of any interference that is correlated with the Northpoint transmitter signal. If needed, the transmitter will be turned off and on multiple times to confirm the behavior.

g. The Northpoint receiver antenna will be adjusted to maximize the signal, and the monitor will be observed to note signal quality and any evidence of interference.

h. The test set antenna will be adjusted to maximize the signal, as observed on the spectrum analyzer. The signal power and the spectrum will be observed and recorded.

i. The pointing orientation of the Northpoint antenna and the test set antenna will be measured for comparison with the expected angle obtained theoretically for the site location.

j. The precision antenna of the test set will then be used to measure an approximate 3D incoming signal power pattern, by pointing the antenna in a sequence of azimuth positions for several values of elevation angle, while observing and recording the signal for each pointing orientation. This test will not necessarily be done at all sites, depending on the nature of the signals observed. However, it is expected that this measurement would be most useful in situations where significant multi-path conditions might exist, and thus will be performed at all locations which have been selected to represent the worst case multi-path situations.

k. All observations and measured data will be recorded in the site log form at the time of the observation. Then, finally, any pertinent comments and notations about the site test will be logged prior to taking down the set up.

l. The equipment will then be taken down and moved to the next site.

Special notes:

(a) The transmitter signal will be normally operated with a fixed bandwidth (8 MHz) for most test sites. However, at some selected sites, a special test will be conducted with a stepped sequence of bandwidths in the sequence: 1, 2, 4, 8, and 15 MHz, respectively while generally following the procedure above for each bandwidth. The plan allows for a

contingent test with bandwidths up to 24 MHz if such is requested by an interested party that is willing to provide the encoder equipment for the test.

(b) Other special tests might be decided and conducted as a part of this project if deemed appropriate on the basis of the results found and if negotiated by interested parties who can provide the required support for any other requested tests.

(6) Data analysis and report preparation:

After completion of the field work, the results will be further organized and analyzed. The data and the results and conclusions for the project will be included in a prepared report.

CERTIFICATE OF SERVICE

I, Shannon Thrash, hereby certify that on this 14th day of August, 2001, copies of the foregoing were served by hand delivery* or first class United States mail, postage prepaid, on the following:

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