



December 17, 2001

Mr. Joe Dichoso  
Federal Communications Commission  
445 12th Street, N.W.  
Washington, DC 20554

Re: Application for Permissive Change  
FCC ID N7NACRD2  
Correspondence Reference Number 21503  
731 Confirmation Number EA102096

Dear Mr. Dichoso:

This letter refers to the pending application of Sierra Wireless, Inc. (“Sierra”), which requested the Commission’s consent to a Class II permissive change to Sierra’s existing certificated equipment, FCC ID N7NACRD2.

Sierra has now tentatively determined that the change it seeks to make to its equipment qualifies as a Class I permissive change and Sierra therefore withdraws its application for Class II permissive change consent. Upon reevaluating the nature of the change to be made to its equipment, and repeating the testing of the applicable Part 22 parameters, Sierra has determined that none of the parameters in the change that it seeks to make exceed the parameters in the original authorization.<sup>1</sup> Sierra has uploaded new test reports to substantiate this result, should such substantiation be necessary, and Sierra requests the Commission accept these new test reports in lieu of the previously uploaded test reports. As a result of these tests, Sierra tentatively believes that this change qualifies as a Class I change and Sierra therefore withdraws its pending application.

In addition, Sierra has determined that the Commission’s original authorization grant to Sierra contained an error in ERP and that the parties’ failure to recognize and correct this error has created confusion in the Commission’s processing of this application as well as Sierra’s previous

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<sup>1</sup> The peak antenna gain of the current Permissive Change is –0.5 dBd. The peak ERP for this change is therefore 564 mW. Other parameters are detailed in the Test Reports uploaded today.

permissive change applications. In Sierra's first submission for this FCC ID, which the Commission granted on January 25, 1999, Sierra stated that its transmitter output power was rated at 28 dBm maximum (conducted). Sierra also stated that its antenna gain was in the range of -2 to -4 dBd. Based on these figures, the Commission calculated the equipment's ERP to be 0.4 Watts.

However, this figure is in error because the gain of -2 to -4 dBd stated in Sierra's original filing was intended to be the average gain of that antenna whereas the Commission processed the application as though this showed the peak gain of the antenna. Sierra commonly uses average gain for cellular omnidirectional antennas as this figure tends to be the most meaningful figure for system engineering purposes, and this common usage spilled over into Sierra's original application for this equipment.<sup>2</sup> We have since come to realize that the Commission typically computes ERP using peak gain, not average gain. As a result, the computed ERP of the initial grant was incorrect. The peak gain for the equipment in that original application was, in fact, 0.5 dBd,<sup>3</sup> which means that the original grant should have stated an ERP of 28.5 dBm, or 708 mW rather than 400 mW. This is still well within the limit of 7 Watts required by the Commission's rules for mobile transmitters.

This error was repeated and shown more clearly in Sierra's second permissive change application for this FCC ID, dated November 23, 1999. In reviewing that application, the Commission requested supplemental information to confirm that the ERP did not exceed that of Sierra's original grant. In Sierra's response, Sierra provided the ERP as the sum of a conducted power of 631 mW (28 dBm) and the antenna gain. The antenna gain was provided in two forms: graphs showing the actual gain vs. direction, and summary numbers which were average gain figures. As in the first application, Sierra used the average gain figures to compute ERP, resulting in a value of 339 mW. In fact, the peak gain of the antenna in that application, as can be seen on the plots provided to the Commission, is 0 dBd. As a result, the ERP in that application should be, in FCC terms, 631 mW.

To resolve this error, Sierra respectfully requests that the Commission issue a corrected authorization showing the ERP listed on the original grant be 708 mW. Along with this letter, Sierra has included test data showing the antenna gain to substantiate the claim that the peak gain in that case was indeed 0.5 dBd (Appendix 1). Given the correction as requested, the previously granted Class II permissive changes for this FCC ID remain valid. The ERP in Sierra's second permissive change application, when corrected for peak gain rather than average gain, is 631 mW

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<sup>2</sup> We compute average gain by summing the gain (in linear terms, not dB terms) for each degree of the 360 degree circle of coverage, then dividing by 360 and then converting back to dB.

<sup>3</sup> Data is included in Appendix 1 to show the gain of the antenna used in Sierra's original application.

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and does not exceed the corrected original value. Sierra's permissive changes other than this second one were not subject to this error.

The ERP errors affect only the value stated on the grant, and do not invalidate any test results of previous applications. All test data submitted for SAR or radiated emissions in previous applications for this FCC ID were measured (or simulated) without using our stated antenna gain, and therefore are unaffected by this error.

In conclusion, Sierra has tentatively determined that the changes requested in the pending application constitute Class I permissive changes and Sierra therefore withdraws its application. Moreover, Sierra believes that an error in the ERP on the original authorization grant has led to confusion and Sierra requests that the Commission correct this error and re-issue the relevant authorizations.

For purposes of completing the record, we include, as Appendix 2, answers to the specific questions that the Commission has raised, to the extent that these remain relevant in light of the information provided herein.

We would be happy to meet with you to discuss these matters and to determine whether you agree with our tentative conclusion concerning the Class I versus the Class II change. Thank you for your assistance.

Very truly yours,

A handwritten signature in blue ink, appearing to read "R. Vanderhelm". The signature is fluid and cursive, with a large initial "R" and a long, sweeping underline.

Ron Vanderhelm, P.Eng.  
Principal RF Engineer  
Sierra Wireless Inc.

## Appendix 1



Sierra Wireless, Inc.  
13811 Wireless Way  
Richmond, B.C.  
Canada V6V 3A4

Phone: 604. 231 1100  
Fax: 604. 231 1109

Date: December 17, 2001

To whom it may concern

Sierra Wireless Inc. has measured the performance of the AC300 antenna as used in the original FCC filing for N7NACRD2. To the best of my knowledge, these measurements were performed following good engineering practice and using procedures consistent with industry standards.

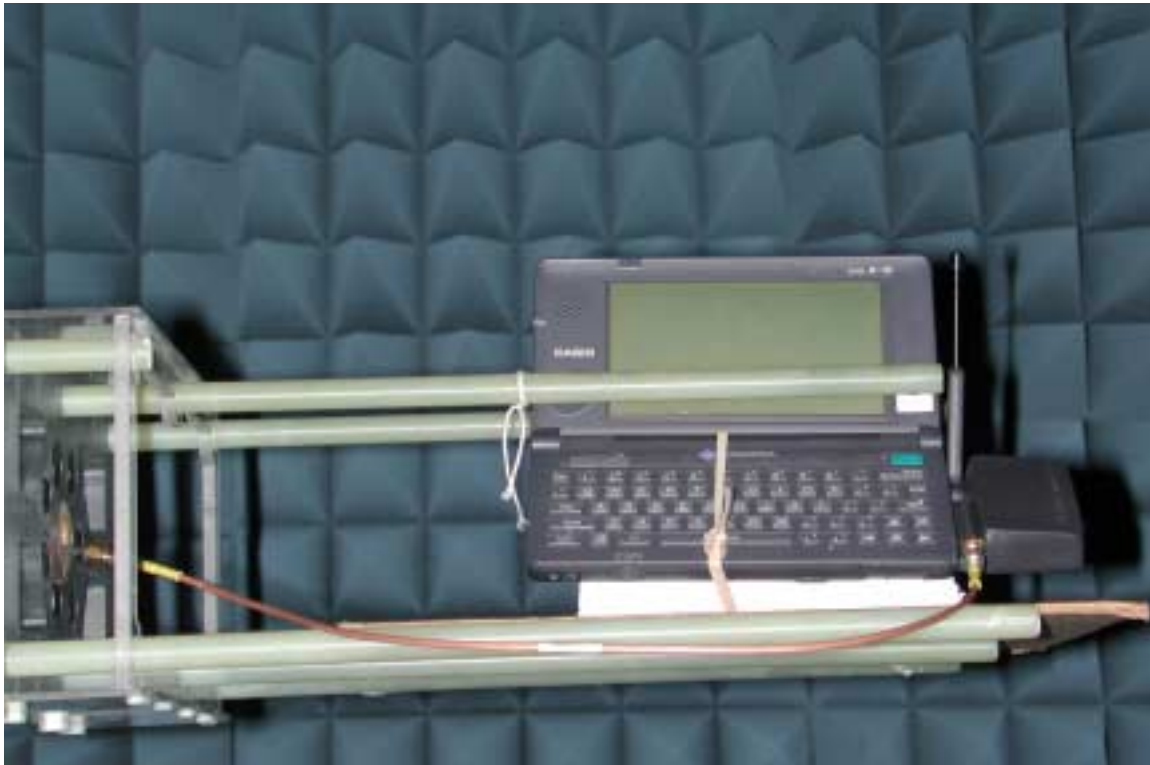
A handwritten signature in blue ink, appearing to read "R. Vanderhelm".

Ron Vanderhelm, P.Eng  
Principal RF Engineer  
Sierra Wireless Inc.

This report presents the measurement of peak gain for the equipment configuration of the original filing of N7NACRD2 granted 01/25/99.

Performance of the antenna used in the original filing of 01/25/99 was re-measured to establish peak gain. The configuration of the DUT in this test is physically identical to that used in the original filing. It uses an AirCard300 (FCC ID N7NACRD2) production unit, with attached battery pack and with originally supplied telescopic antenna. The host palmtop is a Casio Cassiopeia model A10, which is physically identical to the model A11 originally used. The difference between these two models is only in the capacity of the memory chip within the unit.

Photograph 1 shows the DUT configuration mounted in the test chamber.



Photograph 1

The supporting structure shown in the photograph is part of a 3-axis positioner. It is constructed of non-conducting materials and does not significantly affect the radiation performance of the device.

The antenna gain was measured using the configuration in the block diagram of figure A1

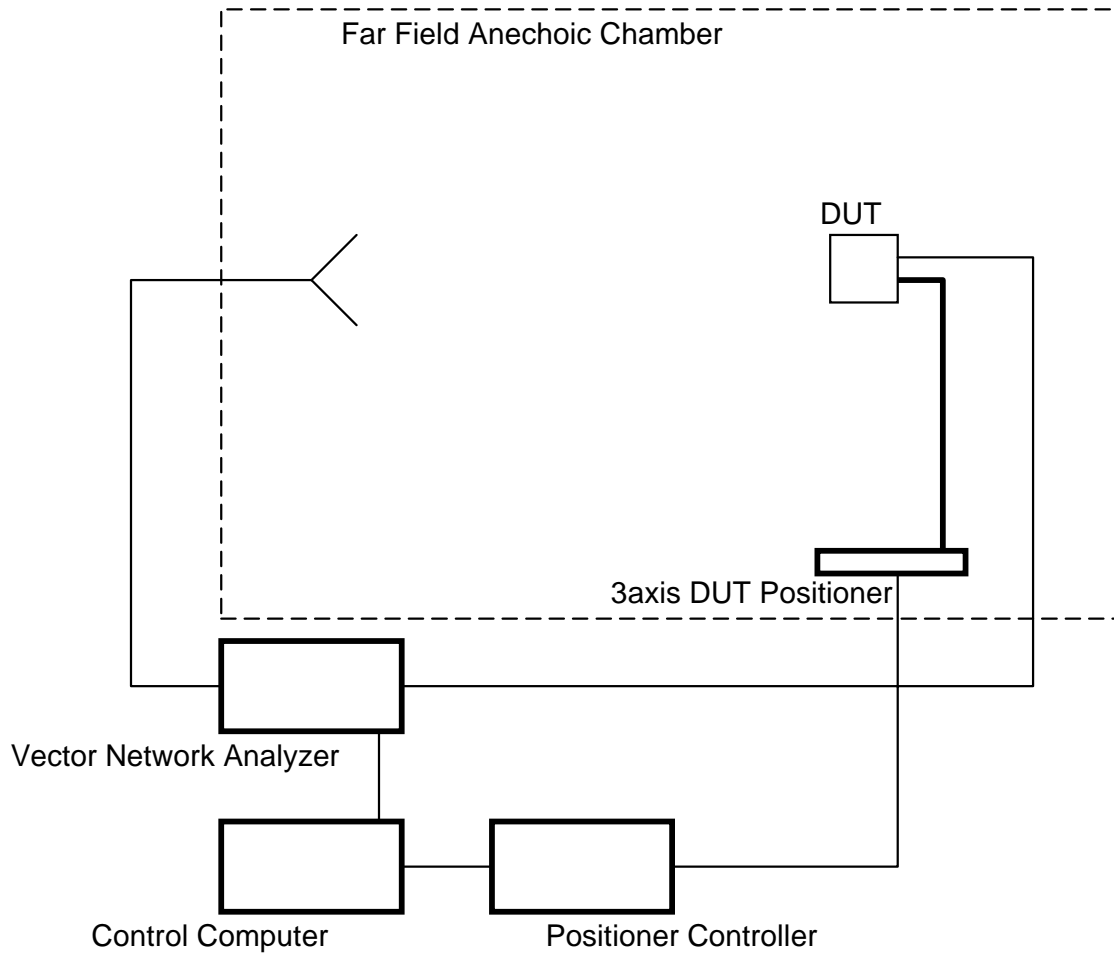


Figure A1 Block Diagram of Antenna Gain Measurement

This test uses a reference dipole as a calibration standard. DUT performance is measured relative to that reference standard. The system was calibrated prior to this test. Measurement equipment used all have valid current calibrations.

Equipment used:

Far Field Anechoic Chamber	ETS Far Field Chamber, SN 12520
3 Axis DUT Positioner	ETS MAP 2015
Reference Dipole	ETS-Lindgren model 3125-870 860 MHz, ser no. 1001
Vector Network Analyzer	Agilent model 8753ES, ser no. US39175229
Positioner Controller	ETS EMCO Model 2090, ser no. 1572

## Test Results

Figure A2 shows a plot of antenna gain vs direction plotted in red. The scale used is 10 dB per division. The green line is data from an unused channel of the instrumentation and should be ignored.

Figure A3 is the same data as figure A2, but plotted on a scale of 2dB per division to better show peak values. The peak value is written on the graph and was determined by finding the maximum reading in the tabular data that form the basis of these plots.

Peak gain is 2.67 dBi, which is equivalent to 0.53 dBd, or rounded for convenience to **0.5 dBd**.

EMC Test Systems  
Pattern using 3164-03 - 1016 and AC300 - #1  
Comments: Testing AC300 antenna with Casio PDA 120 degree screen, 824MHZ  
Pattern using 3164-03 - 1016 and AC300 - #1  
Comments: Testing AC300 antenna with Casio PDA 120 degree screen, 824MHZ  
Test performed on 12/05/01 at 5:16 PM.  
Temperature: 70°F Relative Humidity: 60% Technician: Richard Gu

1: PAT  
2: PAT

TEST PERFORMED  
BY: RICHARD GU  
Richard Gu

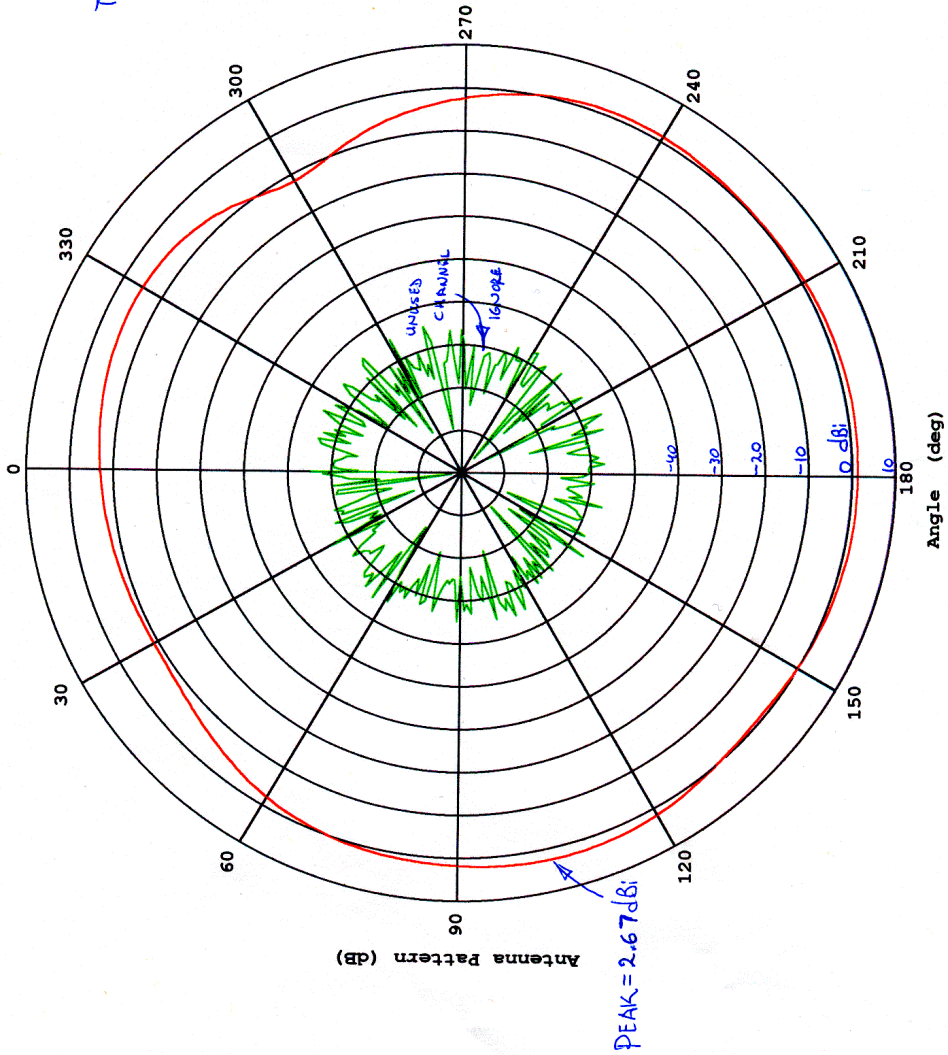


Figure A2



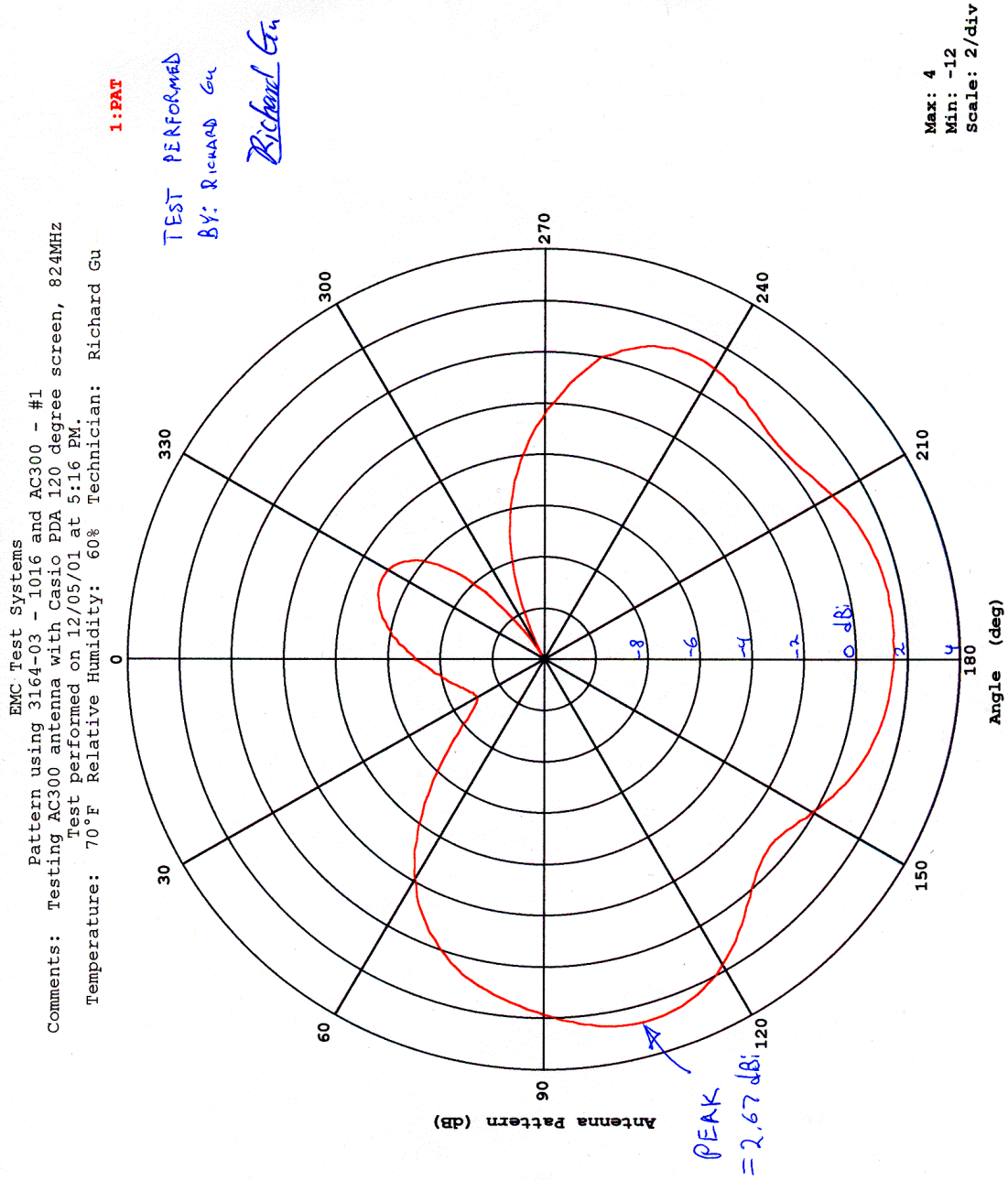


Figure A3

## **Appendix 2**

In light of the requested correction to ERP and the subsequent applicability of a Class I permissive change, we offer these updated specific responses to your previous email communications.

### Your correspondence 21503

An extension until December 17, 2001 as requested is afforded to submit additional information. No further extensions will be allowed.

*1) The ERP should not exceed 400mW in EITHER the "conducted output + antenna gain" or the MAXIMUM PEAK field strength of 123.3 dBuV/m.*

*Based on the test data. You measured 129.8 dBuV/m.  
For an ERP of 400 mW(26dBm) the maximum would be 123.3 dBuV/m. Since the new device is 6 dB more than the original, it really should be dismissed without power reduction.*

*The antenna gain in the SAR report is 2dBi.  
Remeasure the field, strength while lowering the output power until you get a maxum ERP of 400mW(26 dBm). This must agree with the antenna gain and the conducted output power.  
Otherwise, file a new application.*

This letter requests a correction be made to an error in the original grant for this FCC ID. Once that correction is made, reduction of the power to an ERP of 400 mW is unnecessary.

The measurement of 129.8 dBuV/m was in error and reporting this value was inappropriate as it was intended only to show relative levels of spurious emissions. We have submitted new test reports which show a measured value for ERP of 27.8 dBm, using the substitution method. This value is reasonably consistent with the value that would be calculated beginning with the rated power of 28 dBm plus the peak antenna gain of -0.5 dBd resulting in a calculated value of 27.5 dbm.

The antenna gain stated in the previous SAR report is incorrect. We have submitted a new SAR test report which omits statement of antenna gain. We have measured peak gain of the antenna and found it to be -0.5 dBd. Please ignore previous statements of antenna gain for the equipment of this application as they are in error. They were derived from average gain, not peak gain.

*2) You recently submitted a confidential request. Please pay the appropriate fee. Contact Bette Taube at Btaube@fcc.gov for any fee issues. Also, the internal photo's cannot be held confidential. Anyone can take photo's of the device once it is sold. Submit a corrected confidential letter deleting the internal photo's from the list.*

Thank you. As we are tentatively withdrawing our application, we presume that no documents will be posted and so the confidentiality request is not required.

Further to your original email correspondence 21140:

*1) there is still an output power discrepancy which will require a new FCC identifier. The original was granted with an ERP of 400 mW. 600 mW conducted output power with antenna gain of -2 to -4 dBd. So theoretically, the ERP that you are getting now is increased. You now have submitted ERP data of 26.4 dBm ERP. And a field strength of 129.8 dBuV/m (1.75 W ERP) These values are a lot greater than what was originally granted so a new FCC identifier is required. Maybe the new devices have new antennas or enclosures that affect the ERP. The application will be dismissed.*

This letter requests a correction be made to an error in the original grant for this FCC ID. Once the requested correction is made, the discrepancy is removed. New test data shows consistency between the measured ERP and that which would be calculated using the measured antenna gain and the conducted transmitter power.

*2) FYI ... Please use tissue parameters within 5% of supplement C values*

We have repeated SAR tests using corrected tissue parameters. SAR values do not exceed those of the original grant. The new report is uploaded today.

*3) FYI... the other PDA's that you now want authorization for will probably need a new FCC identifier as well.*

If the correction to ERP is made as requested, the changes of the tested equipment configuration can be treated as a Class I Permissive Change. When we test the other PDA's and find that their performance is within, or better than the levels of the original grant, we will also consider those as a Class I Permissive Change. Otherwise, applications will be filed appropriately.