December 20, 2006

Federal Communications Commission
Authorization and Evaluation Division
Equipment Authorization Branch
7435 Oakland Mills Road
Columbia, MD 21046
Attn: Kwok Chan

SUBJECT: **Telex Communications, Inc.**
Response to FCC Comments
FCC ID: B5DB118

Dear Kwok,

On behalf of Telex Communications, Inc. is our response to your comments dated December 18, 2006 requesting additional information for the subject application.

1. Clarify discrepancies of ConvF at 900 MHz in incoming inquiry: 6.04 vs. 6.47?
Probe calibration frequency (ConvF): 6.7 at 650MHz +/- 50MHz 6.4 at 750MHz +/- 50MHz 6.04 at 900MHz +/-100MHz vs. analysis of ConvF of probe at dipole and probe calibration (device freq.) must show SAR variation <5% (e.g. SAR system manual) _OK_ (dipole ConvF=6.47, probe 750MHz ConvF=6.4, probe 650MHz ConvF=6.7).

Celltech Response
The system validation document with probe ConvF 6.47 shown in Appendix E of the SAR report was submitted inadvertently and does not apply to the evaluation. The applicable system validation with ConvF 6.4 (750 MHz) and 6.7 (650 MHz) is shown in Appendix B of the SAR report. Please refer to Appendix B of the revised SAR report (Rev. 1.3) submitted with this response.

2. SAR target values in the SAR report are identified as IEEE targets; however, it appears SPEAG targets are used. IEEE targets at 835 MHz and 1 W is 9.7 W/kg. SPEAG target is lower (about 9.5); however, it may also vary slightly from dipole to dipole. Such discrepancies are found on pages 8, 22, 25 (please check other pages too), which will affect other related information on these pages (15%, dev etc. and it is unclear what this 15% represents).

Celltech Response
The SAR target values listed on pages 8, 22 and 25 of the SAR report are both the SPEAG target and IEEE target. The IEEE target for 1 Watt at 835 MHz is 9.7; so also is the SPEAG target 9.7 for 1 Watt at 835 MHz. Please refer to Table 1 on page 8 of the revised SAR report (Rev. 1.3) submitted with this response listing the SAR system manufacturer's reference body SAR values at 835 MHz.

3. Probe calibration certificate indicates 7% standard deviation for calibrations at 650 and 750 MHz. Incorrect information has been used in the uncertainty table on page 13. Note: k=2 is used for experimental calibration but standard deviation is used for numerical calibration.

Celltech Response
The SAR report was inadvertently submitted listing the probe uncertainty value as k=2 for 650 MHz and 750 MHz on pages 13 and 14. Please refer to the revised SAR report (Rev. 1.3) submitted with this response listing the probe uncertainty value on pages 13 and 14 as standard deviation (7%) in accordance with the probe calibration document.

4. The liquid dielectric parameter measurement tolerances indicated in the uncertainty tables on pages 13 and 14 do not match those on page 6. Please also check other entries in the uncertainty tables to ensure correct information are entered.

Celltech Response
Please refer to the revised SAR report (Rev. 1.3) submitted with this response listing the correct liquid dielectric parameter measurement tolerances in the uncertainty tables on pages 13 and 14.

5. Clarify how the values of 2.9% and 5.1% at the bottom of pages 22 and 25 on estimated SAR changes due to probe ConvF are calculated. Note: The implementation of ConvF on most SAR systems generally follows an inverse relationship to SAR. The Application Note specifies 5%; however, up to 10% may be accepted on a case-by-case basis provided the impact due to tissue dielectric parameters is small; therefore, the total SAR variation is expected to be within 10-15%.

Celltech Response
Formulae used for calculating SAR from measured values taken from DASY4 manual.
V = U + U^2(cf/dcp)
Where:

V = compensated signal of the given channel
U = input signal of the given channel
Cf = Crest factor of exciting field
Dcp = diode compression point

In the conversion factor files for 650 MHz, 750 MHz and 900 MHz the dcp is the same. Therefore the compensated signal resulting from any one measurement will be the same if calculated from any other set of conversion factors.

E = root(V/(Norm*ConvF))
Where:

V = compensated signal of the given channel
Norm = sensor sensitivity of given channel
ConvF = sensitivity enhancement in solution

In the conversion factor files for 650 MHz, 750 MHz and 900 MHz the Norm is the same. Therefore the single deciding factor used for calculation of the SAR from the compensated signal V is the sensitivity enhancement in solution, ConvF. In the following tables, the calculation of E from V, Norm and ConvF are displayed. The Total is performed by root(Ex^2+Ey^2+Ez^2) and the percent difference is calculated and displayed on the bottom line. The 650 MHz measurements calculated manually with the 900 MHz conversion factors given in the probe calibration document expect a 5.32% discrepancy. The 750 MHz measurements calculated manually with the 900 MHz conversion factors expect a 3.74% discrepancy. Please refer to revised SAR report (Rev. 1.3) submitted with this response (pages 22, 25).

	650 MHz	900 MHz
ConvF	6.7	6.04
Vx	18917.50	18917.50
Vy	4929.09	4929.09
Vz	5249.57	5249.57
Ex	5742.07	6047.67
Ey	1451.99	1529.27
Ez	1546.40	1628.70
Total	6121.36	6447.14
% Diff	0	5.32

	750 MHz	900 MHz
ConvF	6.5	6.04
Vx	19052.61	19052.61
Vy	5806.42	5806.42
Vz	4951.13	4951.13
Ex	5871.38	6090.86
Ey	1736.55	1801.46
Ez	1480.76	1536.11
Total	6299.31	6534.79
% Diff	0	3.74

Where: Normx = 1.62 Normy = 1.72 Normz = 1.72 Dcp = 92mV

6. (FYI) The dielectric parameters on pages 29 and 30 should have been measured to at least 835 MHz or higher (preferably 900 MHz since probe calibrated at 900 MHz). See beginning of 1st paragraph on page 6 of application note on method B. This additional information is not requested for this filing because the trend of existing data does not indicate there could be a problem.

Celltech Response
Understood.

7. Does this product only operate at the 3 tested frequencies using the 3 antennas shown, one for each frequency? This may influence the test configurations. Please clarify.

Celltech Response
The 3 antennas utilized for the SAR evaluations are the only antennas designed to be operating with this product. The product and its antennas operate in the following frequency ranges:
614.1-635.9 MHz (Low-Band Antenna)
636.0-725.9 MHz (Mid-Band Antenna)
726.0-745.9 MHz (Upper-Band Antenna)

8. (FYI) Page 8/9 of probe calibration data: conductivity for 900 & 835 MHz body tissue are 1.05 and 0.97 respectively. The difference is 1.05/0.97=8.25%. The liquid used by the lab is within 5% for both 835 & 900 MHz. The probe calibration could be invalid if the same type of liquid is not used during probe calibration and routine measurements. This should be considered for future measurements.

Celltech Response
Understood.

9. Are the extrapolated peak SAR at the phantom surface above the dipole feed-point within 15% of the required values? See 2nd paragraph of application note in SAR Verification section. In this case, a qualitative comparison between 835 MHz SPEAG or IEEE values and method B values would be acceptable.

Celltech Response
The extrapolated peak SAR for 750 MHz is 4.52 mW/g and for 650 MHz is 4.36 mW/g. The target for the extrapolated peak SAR at 835 MHz is 3.53 for a 250 mW dipole feedpoint power. This means that the extrapolated peak SAR for 750 MHz and 650 MHz validations is 28.3% and 23.8% above the target respectively. The probe conversion factors for the 750 MHz and 650 MHz frequencies are calculated numerically and as such do not have the boundary effect correction factors alpha and delta. These correction factors allow for the SAR values for measurements close to the surface of the phantom with reduced boundary effect. As described in the probe calibration document, these correction factors can reduce the averaged SAR values by up to 9.3%. This effect can be reduced by measuring farther from the surface of the phantom when measuring with numerically assessed probe conversion factors. In this case, the assessment was made in this fashion to synchronize the measurement procedures of the 650 MHz, 750 MHz and 835 MHz dipole validations. The inaccuracy gets more extreme as the extrapolation to the surface is calculated. In our opinion, this can cause a difference of perhaps 20% between the peak extrapolated SAR of the measurements made with the numerically assessed conversion factors at 650 MHz and 750 MHz compared with the measured conversion factors used at 835 MHz. This lack of boundary effect compensation provides a more conservative SAR estimate and will not cause a compliance issue in this case.

As an example, a validation performed with the same dipole and probe at 835 MHz gave a peak extrapolated SAR of 3.64 mW/g which is 3.3% above the given target.

Target @ 1W	14.1		
Target @ 250 mW	3.525		
	@750 MHz	@650 MHz	@835 MHz
	4.44	4.3	
	4.49	4.37	
	4.56	4.38	
	4.69	4.39	
	4.44	4.38	
Avg	4.524	4.364	3.64
%Diff	28.3	23.8	3.3

10. The uncertainty tables should be revised accordingly due to probe calibration and tissue dielectric tolerance issues above. Incoming inquiry indicates qualitative estimate of the measurement uncertainty due to the use of method B have been addressed; however, such information is not found in the SAR report. See applicable section of application note.

Celltech Response
The uncertainty tables on pages 13 and 14 of the SAR report have been revised accordingly based on probe calibration and tissue dielectric tolerance. Please refer to the revised SAR report (Rev. 1.3) exhibit submitted with this response.

If you have any further questions or comments concerning the above, please contact the undersigned.

Sincerely,

Jonathan Hughes
General Manager
Celltech Labs Inc.