Worldwide Product Approvals

July 6, 2001

Joe Dichoso
Federal Communications Commission
Equipment Authorization Division,
Application Processing Branch
6435 Oakland Mills Road
Columbia, MD 21046

RE: IMKAP2-1020

Dear Mr. Dichoso:
This letter is in response to your email inquiry dated January 25, 1999 concerning our Class 2 permissive change application to add a new antenna to the above referenced FCC ID. Please unzip the file entitled IMKAP2_1020. Note that the title is the same as the FCC ID except that an underscore(_) was used in place of the dash(-) in the filename.

Issue 1
5 photos of the new antenna are included in the zip file. They are titled 001.jpg through 005.jpg.
Issue 2
The antenna is a model 245BD5W Bi-directional 4/6 dBi antenna, manufactured by Xertex Technologies.
Issue 3
MPE Calculations
Worst case calculations are offered to demonstrate compliance with the Limits of Maximum Permissible Exposure. Calculations were made with reference to OET bulletin 65, Edition 97-01, August 1997.

After evaluation of the document, Equation 5 in section 2 is determined to be relevant to LXE equipment. The equation is given as :

$S=EIRP/4\pi R^2 = (1.64)ERP/4\pi R^2 = (0.41)ERP/\pi R^2$

Where
S = Power Density(mW/cm^2)
EIRP = Equivalent(or effective) isotropically radiated power
ERP = Power referenced to a half-wave dipole radiator
R = Distance from center of radiation pattern to the point of interest

Given:
- Radio ERP = 102 mW or 20.08 dBm as measured and given Proxim's test report
- EIRP = 1.64xERP

The results obtained by these calculations were compared to the limits given in Table 1 of Appendix A of said document.

The Xertex 4/6 Bi-directional antenna is a flat patch antenna and will be used in various applications requiring placement in a variety of settings. However, the typical use of this antenna is thought to be worst case as it will be mounted such that it hangs from an indoor ceiling. The antenna has a height of 4 inches and includes a 3 inch mounting bracket that causes the antenna to hang vertically from the ceiling a total of 7 inches.

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Assuming
The average person is 6 feet or 1. 829 meters tall
The average height of an indoor ceiling in commercial environment is 10 feet or 3.05 meters.

Known
Antenna Length = 4 inches or 10.2 cm
Antenna Mount = 3 inches or 7.62 cm
Highest Gain = 6dBi

Therefore
R = 3.05m(Ceiling Height) - 1.829m(Average Person Height) - .330m(Antenna Length) = .891m
ERP_T = 20dBm(Radio ERP) + 6dBi(Antenna Gain) = 26dBm or 398mW

Result
$S = (0.41)ERP/\pi R^2 = (0.41)398mW/\pi(891cm)^2$
$S = .065mW/cm^2$

The above result is well below the specified $5mW/cm^2$ for Occupational/Controlled Exposure environments, and well below the $1mW/cm^2$ for General Population/Controlled Exposure environments.

Issue 4
LXE utilizes 2 types of connectors for this antenna. They are a reverse TNC for applications in which this antenna is accessible to the general public, and a Standard N connector for applications that are installed by LXE and are not accessible to the General public. This method connector is preferred by our field service personnel for ease of installation and repair. The zip file includes MS Word document entitled P_Install.doc which is a justification that I had included with the original application but must have gotten separated. We believe that the section of 15.203 that references Professional Installation applies for this application.

Issue 5
3 Plots are included as well. They include a plot of the whole allowable band 2400-2483.5 MHz that shows the band utilization. Also, a plot of the 2400-2700 MHz band that shows the transmitter cuts off before the restricted band of 2483.5-2500 MHz and that no spurious emissions from the transmitter fall within the band. Please note that a marker was placed on a spur that falls outside of the band. Upon investigation, this spur was deemed ambient anyway. And finally an ambient plot of the 2400-2700MHz band showing that there are some ambient spurs. These plots are included in the zip file in a separate .pdf file entitled plots.pdf.

Sincerely,

R. Sam Wismer
RF Approvals Engineer
LXE, Inc.