***U.S. WIRE**LESS **DATA**® INC.*
Delivering The New Standard In Transaction Processing

850B Commercial Lane
Palmer Lake , Colorado 80133
(719) 481-6499 Fax 481-6496

Date: 02/05/99

From: Aaron Danis / U.S.W.D. Engineering

To: FCC Frank Coperich

Subject : FCC I.D N5RUSWD500 for USWD500 CDPD modem
Correspondence Reference Number: 5935 EA91801

Hello:

SECTION 1.0.0

The USWD500 CDPD modem is integrated within credit card authorization terminals. The more typical catagory (or name) for these devices are POS (point of sale) terminals. The terminals are primarily designed to be mounted (sit on) on a desk top or in some cases to the wall. The POS-500 pictured, is a example of the desktop/countertop model. In either case, the antenna would be at a distance of greater than 20 cm to the user or nearby person. The POS terminals do not have voice capability, only Cellular CDPD data capability. This being the case, the device would never be held close to one's head. Typical operation is at arms length and the antenna is another 8+ inches beyond that.

SECTION 1.0.2

The standard omnidirectional antenna is a half wave dipole with 2.15 dBi gain. The maximum power output of the USWD500 transceiver is .6 Watts (600 milliWatts). Calculating the ERP (Effective Radiated Power) with the standard 2.15 dBi omnidirectional antenna yields:

$A_{dB} = 10 \text{ Log}_{10} (P2/P1)$

$A_{dB} = 2.15$

P1 = .6 Watts

So

$2.15 = 10 \text{ Log } (ERP/.6W)$

$\text{Log } (ERP/.6W) = .215_{dB}$

$10(\text{Log}(ERP/.6W)) = 10^{.215}$

$ERP/.6W = 1.64058$

$ERP = .6W \times 1.64058$

ERP = .984 Watts (less than 1 Watt)

SECTION 2.0.0

The possibility exists that in fringe areas of CDPD coverage the user may install a 3 dB gain Yagi antenna. WhenYagi's are used, they are always mounted as high as possible above the POS device. Typically on the roof of the building. This is for cosmetic purposes as well as best RF transmit/receive efficiency. Yagi's direction of orientation is towards the horizon, since you are trying to achieve maximum efficiency. Yagi's are cabled to the POS terminal with coaxial cable no shorter than eight (8) feet in length. Using a 3 dB gain Yagi the ERP calculation is:

$A_{dB} = 10 \text{ Log}_{10} (P2/P1)$

$A_{dB} = 3$

P1 = .6 Watts

So

$3 = 10 \text{ Log } (ERP/.6W)$

$\text{Log } (ERP/.6W) = .3_{dB}$

$10(\text{Log}(ERP/.6W)) = 10^{.3}$

ERP/.6W = 1.9952

ERP = .6W x 1.9952

ERP = 1.197 Watts **

This shows that even with a 3 dB gain Yagi the ERP is less than the 1.5 Watt MPE limits. The standard antenna emitts less than one watt.
** This assumes 600 milliWatts at the antenna feed. Cable attenuation will reduce the actual power at the feedpoint of the antenna thus reducing the ERP.

SECTION 2.0.1

WARNING LABEL

This label will be placed on the final product, clearly visible to all persons exposed to the transmitter. The specific location on the final product will be consistent with each same final product, but will vary in location across various final products, and in any case always visible to all persons exposed to the transmitter. The physical size of the label and font size of the lettering will be dependant on the size of the final product, but in any case clearly and always visible to all persons exposed to the transmitter.

WARNING LABEL EXAMPLE

While this device is in operation, a separation distance of at least 20 centimeters must be maintained between radiating antennas and the body of all persons exposed to the transmitter in order to meet FCC RF exposure guidelines.

SECTION 3.0.0

SPECIFIC END USE CONFIGURATION

The specific end use configuration would integrate the USWD500 CDPD modem (N5RUSWD500) within the POS device with the antenna connector near or on the back corner of the device. U.S. WIRELESS DATA's users manual for the USWD500 CDPD modem has a page dedicated solely to 'FCC Information'. This page is immediately following the cover page of the manual. Section **2.0.1** of this memo will be printed on the 'FCC Information' page of the USWD500 Users Manual. This will inform the final systems integrator as to the labeling guidelines required by the FCC for FCC I.D. N5RUSWD500.

A picture of the POS-500 will be a separate file attached with this memo. The POS-500 depicts a typical final product.
File Name: POS500.JPG

THANK YOU -- Aaron Danis