PROPOSED MODIFICATION DETAILS

GENERAL

This section details the modifications to the Microwave Data Systems model CW500 SONET Version being proposed. All performance and construction deviations from the characteristics originally reported to the FCC are addressed

Modulation

The device was originally certified with data rates using modulation that included 16-QAM with a coding rate of ¾. The proposed changes include enabling a higher data rate (SONET) that uses 32-QAM modulation with a coding rate of 9/10. This modification requires no circuit changes as the existing design can handle both modulation schemes. The higher data rate has a wider bandwidth than the previous, lower data rate signal and so the system is reduced to having only two channels at the SONET data rate.

As per the FCC "*If the output power and frequency remain the same and there is no degradation in spurious emission(spurs, harmonics, band-edge) and power density, then you do not have to file a Class II permissive change*."

The change is being included in this application for a Class II Permissive change only for completeness as the tests performed indicated that there was no degradation in either spurious emissions or power density from the original application.

A complete set of antenna conducted measurements and radiated spurious emissions measurements were made with the device configured with the original internal antenna and original high pass filter from the configuration originally approved by the FCC.

Output Filter

Microwave Data Systems would like to be able to use a duplexer filter in pace of the band pass filter that is located between the rf output and the antenna.

A complete set of antenna conducted measurements and radiated spurious emissions measurements were made with the device operating at the new data rate (see above) with the duplexer installed and connected to the internal antenna. The duplexer results had slightly lower output power and power spectral density. The antenna port conducted and radiated spurious emissions were not significantly affected by the change.

Antenna

Microwave Data Systems would like to approve the following antennas for use with the subject device:

Manufacturer	Model	Antenna Type	Antenna Gain (Max, dBi)
Radio Waves	SP1-5.2 5.250	1' Dish	22
Radio Waves	SP1.5-5.2 5.250	1.5' Dish	25.3
Radio Waves	SP2-5.2 5.250	2' Dish	28
Radio Waves	SP3-5.2 5.250	3' Dish	31.2
Radio Waves	SP4-5.2 5.250	4' Dish	34.6
Radio Waves	***SP6-5.2 5.250***	***6' Dish***	***37.6***
Radio Waves	SPD1-5.2 5.250	1' Dish (Dual Polarized)	22
Radio Waves	SPD1.5-5.2 5.250	1.5' Dish (Dual Polarized)	25.3
Radio Waves	SPD2-5.2 5.250	2' Dish (Dual Polarized)	28
Radio Waves	SPD3-5.2 5.250	3' Dish (Dual Polarized)	31.2
Radio Waves	SPD4-5.2 5.250	4' Dish (Dual Polarized)	34.6
Radio Waves	SPD6-5.2 5.250	6' Dish (Dual Polarized)	37.6
Gabriel	QF2-52-N	2' Dish (Dual Polarized)	29.0
Gabriel	QF2-52-N-RK	2' Dish (Dual Polarized)	29.0
Gabriel	QF4-52-N	4' Dish (Dual Polarized)	35.3
Gabriel	QF4-52-N-RK	4' Dish (Dual Polarized)	35.3
Gabriel	*QF6-52-N*	*6' Dish (Dual Polarized)*	***38.3***
Gabriel	QFD2-52-N	2' Dish (Dual Polarized)	28.9
Gabriel	QFD2-52-N-RK	2' Dish (Dual Polarized)	28.9
Gabriel	QFD4-52-N	4' Dish (Dual Polarized)	35.2
Gabriel	QFD4-52-N-RK	4' Dish (Dual Polarized)	35.2
Gabriel	QFD6-52-N	6' Dish (Dual Polarized)	38.2
Gabriel	HQFD2-52-N	2' Dish (Dual Polarized)	28.1
Gabriel	HQFD4-52-N	4' Dish (Dual Polarized)	34.8
Gabriel	HQFD6-52-N	6' Dish (Dual Polarized)	37.8
Gabriel	HQF2-52-N	2' Dish	28.7
Gabriel	HQF4-52-N	4' Dish	34.9
Gabriel	HQF6-52-N	6' Dish	37.9

The following tests were performed to demonstrate that the proposed changes to the antennas comply with the requirements of FCC Part 15 and RSS210 for Digital transmission Systems:

1. Radiated spurious emissions with the product connected to a Radio Wave 6' dish antenna. This test was performed with the device transmitting at the highest available data rate on each of the two available channels.
2. Radiated spurious emissions with the product connected to a 6' Gabriel antenna (model *QF6-52-N*). This test was performed with the device transmitting at the highest available data rate on each of the two available channels.
3. Radiated spurious emissions were repeated using the antenna with the least margin (the Gabriel Antenna) and with the device transmitting at the lowest available data rate on the top, bottom and center channels.

In accordance with the FCC's guidelines, the highest gain antenna was tested to cover the lower gain antenna configurations. In all cases the radiated spurious emissions were more than 10dB below the limit.

The results for the single polarized antenna should also apply to the dual polarized antenna since the dual polarized antennas allow one polarization to be used for transmit and the other for receive and have the same gain as their single polarization counterparts.

Antenna specification sheets and revised rf exposure calculations are included with this application. Note that the dual polarized Radio Wave antenna specifications are the same as those of the single polarization antennas