

**Application for Experimental License**  
**Microwave Data Systems**

**Location of Testing**

Microwave Data Systems' plant is located in Rochester, New York. The geographic coordinates of this facility are 43° 07' 06'' North Latitude, 77° 36' 43'' West Longitude. Our expectation is that the majority of testing will occur within a 33 kilometer radius of this location. All equipment is of the fixed type, so the installations would be considered as being fixed-temporary.

An important minority of testing will take place at so-called "beta sites" located at various locations in and around Rochester NY. These sites are provided by current and potential customers, as a way for Microwave Data Systems to evaluate the suitability of our developmental radios in actual field installations. The beta sites also provide valuable field experience in a variety of physical and electrical environments, and with a variety of propagation conditions.

Although beta sites are not, in general, owned by Microwave Data Systems, the equipment that will be tested under the requested Experimental License at these sites will be owned and controlled by Microwave Data Systems. No equipment will be offered for sale to customers prior to receiving FCC Type Acceptance for that equipment.

In view of the forgoing, Microwave Data Systems is requesting that this Experimental License be valid for operation within 33 KM of Rochester NY.

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### **Antenna Location**

In the primary area of experimental operation, at Microwave Data Systems' plant and surrounding locations, antennas will be mounted on existing buildings, or on existing masts on buildings. The height of the antenna will not exceed 6 meters above the existing structure. In some cases, the antenna may be mounted on existing radio towers. In such cases, the antenna will not exceed the height of the existing tower.

It is likewise expected that antennas at "beta site" locations will be mounted on existing buildings, or on existing masts on buildings. The height of the antenna will not exceed 6 meters above the existing structure. In some cases, the antenna may be mounted on existing radio towers. In such cases, the antenna will not exceed the height of the existing tower.

However, should a situation arise where the antenna needs to be more than 6 meters above a building or existing structure, or exceed the height of an existing radio tower, Microwave Data Systems will investigate the distance to the nearest aircraft landing area and will coordinate with the District Engineer-in-Charge prior to making such an installation.

### **Antenna Parameters**

A Yagi high gain antenna will be used, The orientation of the antenna at each end will depend on the location of the remote end of the link. The maximum gain is 10dB, it is Microwave Data Systems intention to limit the ERP to 36dB, the higher gain antenna was chosen to allow for cable loss and connector mismatch. Also a Omni antenna will be installed at the base station for this Multi-point application

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**Station Identification**

The radio equipment which will be tested under this license is designed for data telemetry applications. As such, there is no provision for station identification, as none is required under the Rules under which the equipment would operate once FCC Type Accepted.

Therefore, Microwave Data Systems requests that operation under the license be specifically exempted from the requirement for station identification contained in § 5.152, and that the license be so endorsed.

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**Purpose of License and Program of Experimentation**

The purpose of this Experimental License will be to test new radio technology being developed for applications in the USA. The technology replaces much of the analog circuitry and components used in current production radios with software processing incorporated in digital signal processors (DSPs).

This technology uses Spread spectrum, frequency hopping technology.

This technology holds the promise of better spectrum utilization because of the DSP's flexibility in implementing filtering and in shaping of the baseband digital signal. In addition, various algorithms can be incorporated to accommodate squelch, dynamic noise reduction, and other techniques.

We request confidentiality because we will be using these test frequencies for developing proprietary new high tech OFDM modulated products and disclosing this technology will put us at a significant disadvantage compared to our competitors.

While extensive use of laboratory testing and computer simulation indicates that these will be significant contributions to the state of the radio art, it is essential that radios incorporating these techniques be tested in real-world, over-the-air, situations. Our objective is to validate the designs under a variety of real-world installation conditions.

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**Description of equipment for experimentation.**

Microwave Data Systems is developing a new point to multipoint ISM band 900MHz radio capable of operating over a frequency range of 902-928MHz with a maximum transmitter power of 1 watt (+30dBm).

It will be designed to meet all current FCC part 15.247 specifications.

It is meant for import sales with in the US and shall be in accordance with all local specifications.

The radio uses technology, which is new to the FHSS world, in particular OFDM modulation will be used. The requested bandwidth of this new radio is 26MHz. Our radio will employ frequency hopping spread spectrum . It is different from any other radio because it will employ OFDM developmental modulation with MAC media access controller capabilities. The radios interface will be IP based protocol. We intend on achieving much greater ranges than any other currently available products by using OFDM instead of the typical direct sequence.

It is essential that the effect of real world propagation, with all of it's problems and anomalies, be tested by operating over-the-air links before the product is put on the market. Operating such links will give us the experience to evaluate and to improve performance, if necessary. We expect that the state-of-the-art will be advances by these over-the-air tests.