

TECHNICAL STATEMENT
APPLICATION FOR A NEW EXPERIMENTAL STATION
AUTHORIZATION IN NEW YORK CITY

by

MITSUBISHI MATERIALS U.S.A. CORPORATION

This Technical Statement is in support of an application by Mitsubishi Materials U.S.A. Corporation (Mitsubishi Materials) for authorization to operate a new Experimental Radio Station in New York City. The Statement provides information requested in the accompanying FCC Form 442.

1. SWIFTcomm Overview

The SWIFTcomm™ name is derived from its description – a Smart Wireless Internet for Field Teamwork communication. It operates at common data rates, with low cost and seamless integration with the Internet.

It is the world's first system that is intended primarily for the business community, yet is user-friendly and inexpensive. It operates transparently with normal business operations. Following initial business deployments, a market for personal use is expected to emerge.

SWIFTcomm is designed to be used over very wide areas. Standard business applications, such as E-mail, are prime applications, but other applications will emerge such as providing connectivity to the Internet, and connections for automotive and facility sensors. It will enable the first practical and economical interconnection of many devices that are today unconnected. Thus, SWIFTcomm is an enabler of e-commerce to greater depths within an entity's organizational structure.

To facilitate deployment, the system is designed with an open architecture. SWIFTcomm is already receiving serious interest and support from many industrial leaders. It is expected that the New York demonstrations will generate additional interest from others.

In addition to the technology demonstrations, it is expected that the New York Experimental Station will allow further refinement and optimization of SWIFTcomm technical parameters.

2. Technologies

The SWIFTcomm experimental operation will contribute to the radio art through the testing of several new radio technologies. These include the following:

Super Narrowband™ is a technology that allows less susceptibility to interference caused by multipath and frequency-selective fading compared with conventional broadband/narrowband digital wireless communications. It can realize reliable digital communications while the Mobile Link Unit (MLU) is moving at high speed.

IPMA™ (Internet Packet Multiple Access) is a unique wireless protocol that can handle IP packets and provide multiple accesses by a single carrier. Its two fundamental advantages are quick access, and adaptability to traffic density.

Khiva™ is a system that performs routing and communication control between the global network and an MLU by information and location management, and by authentication.

Direct IP™ is a combination of IPMA and Khiva to realize direct access from a mobile PC-to-IP network, without an extra conversion component such as a gateway.

DRS (Distributed Radio Station) is a radio station system allowing flexible arrangement of base stations so the network capacity may be optimized according to traffic density and service requirements.

Digital Overlay™ is a technology to search for, and receive, the frequency of an access point very quickly, even when the MLU is activated in a completely different service area.

MLU (Mobile Link Unit) is a data input/output device, which contains a control unit, wireless unit, and antenna in a mouse-shaped case, called Mouse Jr™.

CarNAVINET™ is a system for communication between car navigation devices.

3. Frequency Coordination

It is planned to operate the SWIFTcomm system on up to 15 different frequencies at any one time in the bands shown on Form 442. These transmissions will have a bandwidth of 12.5 kHz. In support of the showing requirements of 47 CFR 5.85(b), this number of frequencies is needed to enable frequency reuse over the coverage area, and to permit transmit/receive frequency separation at each base station and mobile station.

Mitsubishi Materials has already begun coordination of its planned operation with the Personal Communications Industry Association (PCIA), which is an FCC-designated Industrial/Business Pool Frequency Coordinator. Mitsubishi Materials will continue to work with the coordinator during the experimental operation so that the chances of objectionable interference are minimized.

The SWIFTcomm system was operated under two separate FCC Experimental Special Temporary Authorizations in the Oklahoma City, Oklahoma area during November 1997 and April-May 1999 (call signs KS2XAS and WA9KFC, respectively). No instances of objectionable interference from that operation were reported.

4. Request for Waiver of 47 CFR. 5.115 (Station Identification)

Waiver of the station identification requirement in 47 CF.R. 5.115 is requested. The SWIFTcomm system employs DQPSK digital modulation and has no provision for analog transmission. Thus, the requirement of station identification in clear voice or Morse code is not possible with the present technology. Substantial modification of the existing equipment hardware and software would be required, resulting not only in significant delay of the experimental operation, but also greater uncertainty when interpreting experimental results.

As noted in Section 3 above, Mitsubishi Materials is proactive when considering the compatibility of its experimental operation in the New York radio environment. It is believed that by working with the PCIA frequency coordinator for area, the chances for objectionable interference can be minimized from the start, and promptly corrected should it occur.

5. FCC Form 442 Supplemental Information

The accompanying FCC Form 442 calls for several items of more-specific supplemental information. That information is presented here in the numerical order of the application sections.

Response to Section 4(G) – Operation will be on up to 15 different 12.5 kHz bandwidth channels at one time, in the bands shown. The Necessary Bandwidth was determined by measurement.

Response to Section 5 – A combination of base stations and mobile stations will be used. Their locations are subject to change, but will be within the area of operation described. The number of base stations and mobile stations in use at any one time will also vary; the maximum number of base stations will be 15, and the maximum number of mobile stations will be 20.

Response to Section 10 – Various operations will be conducted, including the following:

- (a) Experiments related to the SWIFTcomm system
- (b) Demonstration of equipment and techniques to interested parties
- (c) Development of radio technique, equipment, and data related to the SWIFTcomm system
- (d) Limited market studies

As this will be the first time this set of unique technologies has been deployed in a challenging urban propagation environment, the program of experimentation will generate new information and contribute to the radio art. This information will help future SWIFTcomm customers by allowing more predictable systems to be designed and deployed at the start, minimizing the need and cost of follow-on infrastructure adjustments.

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