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January 23, 1998

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Federal Communications Commission
Office of Secretary

VIA HAND DELIVERY

Ms. Magalie Roman Salas, Secretary
Federal Communications Commission
Experimental Licensing Branch
2000 M Street, NW
Suite 230, MS 1300E1
Washington, D.C. 20554

Re: Spike Technologies, Inc.
Experimental Station WA2XCV
Nashua, New Hampshire
Progress Report

Dear Ms. Salas:

Submitted herewith on behalf of Spike Technologies, Inc. ("Spike"), licensee of the above-captioned experimental facility, is an original and one copy the station's semi-annual progress report pursuant to Section 5.204(a) of the Commission's Rules.

Please contact the undersigned if there are any questions.

Very truly yours,

Steven A. Lancellotta

cc: H. Franklin Wright, OET

Enclosures
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Federal Communications Commission
Office of Secretary

Spike Technologies, Inc.

Experimental License

Progress Report No. 3

Introduction

Spike Technologies is a microwave equipment provider with technical facilities in Nashua, New Hampshire. Spike's technical strengths include a proprietary sectored antenna system that creates a multitude of narrow, individually-focused beams, resulting in greatly increased capacity through frequency reuse, two-way capabilities, and the ability to reduce interference to and from the system by positioning the beams accordingly.

In late 1995, Spike began developing equipment for bi-directional delivery of digital services such as Internet, data connectivity, videoconferencing and telephony over MMDS channels. These services will enable the wireless cable operator to more effectively compete against the traditional cable operator.

In July 1996 Spike was granted an experimental license to test its systems using MMDS spectrum in the vicinity of the Company's Nashua, New Hampshire technical facility. The license specifies that Spike is required to submit semi-annual reports of its progress to the Commission. The first of such reports was filed in January 1997 ("the January 1997 Report"), and contains details of Spike's accomplishments in both technical and market development issues. The second of such reports was filed in June 1997 ("the June 1997 Report"), and focuses on equipment integration issues, macro cell size, the pending two-way ruling and future development plans.

This is the third of Spike's semi-annual updates to the FCC, and is drafted with the assumption that the reader has already seen the previous reports. In order to avoid repetition, we will refer to those reports as appropriate.

Summary of Items from the Prior Reports

Throughout the January 1997 Report, we touched on various technical issues, and in many cases we mentioned our approaches going forward in these respective areas. By January, we had made significant progress in our component-level designs, and our planned enhancements for our components were fairly clear. We needed to add diagnostic capabilities to our transceivers, so they could be monitored remotely. Also, we needed to examine additional modem designs, to explore different modulation techniques. We were less clear on what system-level issues might arise, although we knew they were certain to surface.

By June 1997, we were well focused on system level issues including the integration of computer networking equipment with the broadband RF equipment. Additional modem prototypes suitable for bi-directional broadband data transmission had still not yet become available.

We have made significant progress since the last report. This report will focus on several areas: (i) System level testing and transceiver design; (ii) Expansion of system operations; (iii) International efforts (iv) Type acceptance and the current two-way rulemaking proceeding; (v) future activities.

Design and Test

Transceiver Design

We have upgraded our transceiver design to incorporate remote diagnostic capabilities. We have added digital circuitry to monitor vital transceiver functions. Prime power status, oscillator lock, switch settings and transmit-ready indications are readily and remotely obtainable. We are considering the inclusion of a Simple Network Management Protocol (SNMP) chip set, which could send vital information back to the network management software. With this feature, a systems administrator could view a map of the network, identify a defective transmitter and disable it as needed. By adding certain components, we should be able to remotely control certain parameters of the transceiver, such as gain and power output. This enhancement should make on-site adjustments less frequent, and therefore make it less necessary for technicians to climb towers. The efficiency of the system should be improved, along with the safety of the work environment. Also prevented is unauthorized user adjustment of installed equipment. We are continuing our design work to optimize cost and performance, and in this report we include results from our system level test activity.

Modem Equipment

Although we are in touch with many modem companies, we have seen little progress in the area of modems with substantial upstream bandwidth. Therefore, most of our efforts have continued to include the QPSK symmetrical modems we have been using all along. These modems continue to perform reliably with more than adequate throughput. We have recently begun testing point-to-point modems from a new start-up manufacturer. These are also based on QPSK modulation but operate in a continuous rather than burst transmission mode and employ forward error correction which eases signal to interference requirements. Occupied channel bandwidth and data rates are adjustable with asymmetrical operation possible. We have been successful in using these modems to establish temporary point-to-point links in Nashua and are quite pleased with the results. We are anxiously awaiting and encouraging development and availability of a point-to-multipoint (head-end) version. Our antenna system is now capable of QAM 64 operation, so we look forward to the availability of suitable modems.

System Test

Our laboratory and field tests have helped clarify the system performance levels we need for highly reliable links. We needed to know "how good is good enough". In general, performance tends to be very demanding. We have established target system performance levels for power compression points, overall phase noise, signal to noise ratios, and antenna sidelobe levels. We've gained a further understanding of the impact of co-channel interference and the need to place improved filtering at critical points in the signal chain. This information has impacted our transceiver design. It has become clear that low cost affordable subscriber equipment is certainly obtainable when we place more performance burden on the base station transceiver.

The work we have done at MMDS has served as the basis for designs in other bands. By adding an upconverter stage to our existing MMDS hardware, we have been able to prototype a system for use in the 5.8 GHz Unlicensed National Information Infrastructure (U-NII) band. This system is currently undergoing field trials at the corporate headquarters of a leading computer networking equipment company, providing a broadband wireless local area network for multiple corporate facilities.

System Expansion

We continue to add sites in Nashua for our market test. This allows us to gather information on sector to sector isolation and gauge the impact of any added interference on the rest of the system. Results continue to be positive and are proving the viability of our sectored approach.

We have also been successful in establishing a two-way RF repeater on top of one of the local hospitals. Also known as a "beambender", this repeater receives a transmitted beam, amplifies the signal, and then re-transmits in a different direction. It works in a two-way mode, rather than in only one direction. This allowed us to reconnect a former user who had moved to a non line-of-sight location.

International

Two significant achievements occurred in South America. First, with our lessons learned in Nashua, we launched a system to connect two distant towns and provide communications between multiple science foundations and government facilities. The system is being used extensively for data transfer, video conferencing and Internet access. Phase two is underway which will bring an Emergency Management organization and hundreds of subscribers onto the system network.

The second achievement was installation of our first two-way Digital Repeater. Far more advanced than the RF repeater described above, this repeater actually demodulates the RF signal, reducing it to digital information, and then creates an entirely new RF signal that represents the same info. This approach eliminates any noise that may be picked-up in the first portion of the path. The repeater was necessary to establish a wireless backbone link between non line-of-sight towns of greater than 50 miles separation. It was very exciting to be able to prove the concept discussed in the June report that the range of a base station can be extended in a given direction without degradation of the local coverage area.

This South America installation is an example of the benefit our technology can bring to the public, and could certainly be realized here in the United States, as soon as the two-way rulemaking is complete. We thank the Commission for granting our experimental license, and making these accomplishments possible.

FCC Regulatory Matters

As we have a strong desire to move aggressively toward launching systems in the United States, we have placed considerable focus on regulatory issues. We have performed a variety of tests and applied for a grant of equipment authorization (type acceptance) for our current transceiver design. Our tests demonstrated compliance with the Commission's rules and regulations. Based on correspondence from the Commission, we are confident that we will be able to satisfy any technical impediments leading to type acceptance. We have gained invaluable experience in this area, which will allow us to bring our next generation transceiver quickly through the authorization process.

On October 10, 1997 the Commission released a Notice of Proposed RuleMaking ("NPRM" MM docket 97-217) to substantially amend its rules and enhance the ability of MDS and ITFS licensees to provide two-way communication services. We have become involved in this proceeding and submitted comments to offer some of the insight and perspective we have gained. As first outlined in our June report, we believe that an important feature of a point-to-multipoint broadband data system is the ability to interconnect the subscribers so that they can communicate with one another at high speeds. Videoconferencing is one application that depends on this interconnection. We have the ability to create an "Intranet" for our system users. An operator who is solely concerned with providing Internet access may not be as concerned with interconnecting the subscribers. With our comments, we have introduced ideas relating to subscriber

interconnection, reduced interference through multiple access techniques, and a demonstrated ability to create long distance non-interfering wireless backbone links. We are currently preparing reply comments and we look forward to providing any assistance necessary to the Commission during this critical rulemaking.

Future Activity

We have been testing a software-based approach that will allow our system to function as a backbone for a variety of telephone services and are close to receiving certification as a Competitive Local Exchange Carrier (CLEC). We feel that if wireless cable operators are to effectively serve the public interest by providing advanced communications services, they will need to understand CLEC issues and technologies. We hope to bridge this gap in the industry by incorporating these capabilities into our system.

The technical efforts we have discussed will be explored both domestically and internationally. We must continue adding market test sites to the Nashua system and continue identifying multi-user system capacity and interference issues.

Although we continue to research the aforementioned issues, we feel that our equipment is ready for widespread deployment. We applaud the Commission's two-way rulemaking efforts, and hope that the process can be concluded soon.

If any Commission member has questions, please feel free to contact Spike's President, Douglas Carey at (212) 924-5000 or myself.

Sincerely,

Christopher Moritz
Senior Manager
Government Regulations & Systems
Spike Technologies, Inc.

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