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**SCANNED**

AUG 10 1999

**NORTEL**

By Messenger

September 13, 1995

Mr. John Morgan  
Chief, Experimental Licensing Branch  
Federal Communications Commission  
2000 M Street, N.W. - Suite 230  
Washington, DC 20554

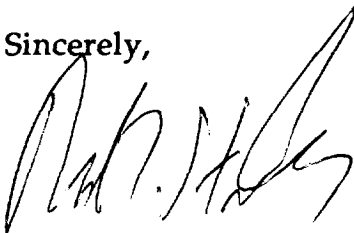
Reference: File #4575-EX-MR-94; Call Sign K I 2 X A G

Dear Mr. Morgan:

In accordance with the terms of the referenced license, enclosed please find a report of the experimental license for the period stated, March 14, 1995 to June 14, 1995.

Please call me if you have any questions.

Sincerely,



Raymond L. Strassburger  
Director, Government Relations - Telecommunications Policy

RLS/gj

Enclosure



File # 4575-EX-MR-94  
Call Sign K I 2 X A G

**EXPERIMENTAL RESULTS**

for the

**FEDERAL COMMUNICATIONS COMMISSION**

Frequency Liaison Branch  
2025 M Street N.W.  
Room 7326  
Washington D.C. 20554

by BNR Inc.  
P. O. Box 833871  
Richardson, TX  
75083-3871

For the Period

Mar. 14, 1995 to Jun. 14, 1995



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**INTRODUCTION**

This progress report is a summary of the types of emissions used and the technical findings from experimental tests conducted by BNR Inc., using license #4575-EX-MR-94. The tests were authorized by Experimental Radio License file number 4575-EX-MR-94 for tests in the vicinity of:

- (1) Richardson, TX
- (2) Mountain View, CA, and
- (3) Research Triangle Park, NC.

The license authorized BNR Inc. to use and operate the radio transmitting facilities, hereinafter described, for radio communications as shown in Table 1.

**Table 1**

<b>Authorized MHz</b>	<b>Frequency</b>	<b>Authorized Power Power (watts)</b>
864-868		10 milliwatts (ERP)
901-904		3 (ERP)
902-928		1 (ERP)
930-960		10 milliwatts (ERP)
946-949		1 (ERP)
1850-1990		1 (ERP)
2400-2483.5		1 (ERP)
5725-5850		1 (ERP)

The initial authorization was effective August 14, 1991 and the renewal authorization will expire 3:00 A.M. EST January 1, 1997.

**EXPERIMENTAL TESTING IN THE VICINITY OF RICHARDSON, TX****TYPE OF EMISSIONS USED**

For the period March 14, 1995 to June 14, 1995, the Companion #1 test equipment transmitted in the 864.1 to 868.1 MHz range. Companion system #1 continued to operate with 25 Base Stations and 40 Handsets throughout the period.

Companion system #2 was placed in service in November 1993 and was originally transmitting in the 944-948 MHz range. Companion #2 system is being downsized and the hardware re-configured for other testing. The system consisted of a total of 53 Northern Telecom base stations and 100 Shaye handsets. Of this equipment, 22 base stations and 14 handsets will remain in service for continued testing and development at these frequencies; while the remaining equipment is being modified to support other testing.

Total hardware in use, for both systems in the testing program, consists of 47 Northern Telecom base stations, 40 Motorola 2000 "SilverLink" handsets, 14 Shaye handsets, and two Northern Telecom Companion controllers.

**ACTIVITIES**

BNR's *in situ* trial program in the Richardson, TX, BNR and NT buildings currently has two systems in operation. The Companion #1 trial system is focused on private PCS system capabilities as an adjunct to a PBX in order to evaluate the provisioning and feasibility of providing the user with PBX type features. The Companion #2 trial system is a public PCS networking system focusing on issues concerning system installation, provisioning, and reliability in a public network environment.

Companion system #1 continued to operate with an active user community of 40 users and a homogenous handset environment consisting of 40 Motorola SilverLink 2000 sets. System testing continued during this

period with attention to system uptime and robustness. This system has sustained an uptime performance exceeding 99%.

The Companion system #2 trial system is a public PCS networking system and has been placed in a number of NT/BNR buildings in Richardson, TX and Mountain View, CA area. The system is primarily concerned with verifying software reliability, software integrity, system stability, and long term system performance. During the reporting period, Companion system #2 was re-configured to facilitate equipment reuse. The system had operated for over one year, with system uptime exceeding 99%.

The PCS1900 system, which came on line during Q4 1994, provided the switching platform for numerous customer demonstrations and trials. The PCS1900 system operates at 1850 to 1990 MHz range at a power level of 2.0 W(EIRP) at the antenna. Currently, there are 35 Nortel AEG 1901 handsets in use on this system. These handsets and the associated radio base stations successfully completed the FCC approval process for deployment in the United States. The 35 PCS 1900 users consist of Nortel and BNR engineers and managers.

#### **TECHNICAL FINDINGS**

**Companion System #1:** The system performance under a continuous and sustained traffic load for the period has been excellent with no known outages. Neither system capacity nor performance has been impacted by a full user load during the period. Even though the system is operating in the same physical area as the Companion #2 system there have been no adverse radio interference effects observed. Additionally, no interference has been observed from the Microcellular trial system which is also operating in the Richardson facility.

**Companion System #2:** System #2 conversion completed during the reporting period to the 864 - 868 MHz range. The initial user population was established at 30 users. Handsets implemented included Shaye LPC 77 and Sony DCT-H2. The conversion went smoothly and the new system's uptime has exceeded 99%. As previously reported, no observable interference has been detected or reported.

As stated in our last quarterly report, the PCS 1900 system came online smoothly. The PCS1900 switch has facilitated numerous customer demonstrations and trials at remote locations throughout the Americas. Demonstrations included Northern Telecom's Smart BTS system, Mini-BTS, AEG handsets and numerous antenna configurations. Trials are being initiated at several customer locations under their local licenses. Data may become available within the next six months as these trials begin to capture technical performance and user information.

## **EXPERIMENTAL TESTING IN THE VICINITY OF MOUNTAIN VIEW, CA.**

### **TYPE OF EMISSIONS USED**

For the period March 14, 1995 to June 14, 1995, the Northern Telecom (NT) Companion system was transmitting in the 864.1 to 868.1 MHz range during testing at Mountain View, CA. One additional base station was added to the system bringing the total to 20 Northern Telecom base stations distributed into 11 cells; these provide service to the 192 users who are developing and testing the system.

### **ACTIVITIES**

The trial in progress at our Mountain View, CA, facility focused on using the trial system as an adjunct to a large PBX system. During the reporting period, the newest version of the Northern Telecom (NT) Meridian Companion system software and hardware was fully integrated into the Meridian One PBX.

The addition of 1 new base station brings the total to 20 Northern Telecom C1100 base stations divided into 11 cells. The user population remained constant at 192 users. Users have complained about the low voice levels on the handset; however, this is the only complaint regarding the system or its components. This information has been relayed to the manufacturer.

The Santa Clara, CA Companion system is now operating with 15 Northern Telecom base stations, a reduction of 8 base stations, divided into 6 cells, 1 Northern Telecom controller, 70 Shaye LPC66 handsets, and

currently has 70 users active on the system. The Shaye LPC66 (C3020) handsets utilize the CT2 plus protocol at 944-948 MHz rather than the CT2 protocol used in Mountain View with the Shaye LPC33 handsets. The handsets used in one system are not compatible with the other system.

### **TECHNICAL FINDINGS**

At Mountain View and at Santa Clara, coverage problems have been minimized through the application of a new computerized deployment tool. The implementation of the fully integrated Meridian One Companion system progressed well with the entire system now on line supporting the user population at both facilities.

The Santa Clara system has been divided into 6 cells and is comprised of 15 Northern Telecom C1110 base stations. This is a reduction of 2 base stations from our previous report. Seventy NT employees are using the Shaye LPC66 (C3020) hand sets. Participants report productivity gains from the improved mobility and better use of their time while away from their desks.

### **EXPERIMENTAL TESTING IN THE VICINITY OF RESEARCH TRIANGLE PARK, N.C.**

#### **TYPE OF EMISSIONS USED**

For the period from March 14, 1995 to June 14, 1995, an in building test system was in service transmitting in the 864.1 to 868.1 MHz range. The Companion 100 system consists of a Northern Telecom controller, 24 base stations, 102 Motorola "SilverLink" handsets, and a DMS-100 Digital Centrex switching system. The active user count increased from 50 to 102 during the reporting period.

#### **ACTIVITIES**

The trial system at BNR/NT's facilities in Research Triangle Park (RTP), NC, operates at 864 to 868 MHz and consists of 24 Northern Telecom base stations, a zone controller, and 102 Motorola SilverLink handsets. Work in RTP has focused



on users and has allowed the users to experiment with and understand the capabilities of the wireless system in an actual business environment. Increasing the user population has provided increased loading on the system to more closely simulate a wireless business environment.

There were no major changes during the reporting period for the RTP system.

### **TECHNICAL FINDINGS**

The RTP Companion system continues to operate with good reliability and uptime. There are no new findings to report from operations or testing in RTP at this time.

### CONCLUSIONS

The ongoing testing and trialing of the systems at Richardson, Research Triangle Park, Santa Clara and Mountain View is providing insight into the need to further develop PCS systems with new and enhanced features. New features will provide the user with a greater level of service and control while mobile within a single campus environment or while roaming in a public network environment. Also highlighted is the fact that additional long term testing of these systems will further the corporation's knowledge of our wireless systems' operational capabilities with a focus toward further enhancement. This will result in increased knowledge of feature requirements and operational characteristics in both private low-power, in-building and public low-power environments and have a significant impact on ease of use.

The operation of these test sites during the reporting period has further demonstrated the significant need for tetherless communications by business users in both environments as well as the need for public and private systems inter working. Features, such as CLID, Name Display, and Silent Ringing, will provide the wireless user with capabilities to better manage their environment. User productivity increases have been documented based on being "in touch" through wireless communications. Privacy for users away from their office was enhanced since they didn't have to use a wireline phone in a colleague's office.

**FCC STAFF INQUIRIES**

Regarding this report, FCC staff inquiries should be directed to:

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