

Link Brown
Director-
Federal Regulatory

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August 7, 1997

Mr. H. John Morgan, Chief
Experimental Licensing Branch
Federal Communications Commission
Mail Stop 1300E1
2000 M St., N.W., Room 230
Washington, D.C. 20554

Dear Mr. Morgan:

Re: Progress Report for Experimental License
Call Sign: KM2XOF - File Number 5022-EX-ML-95

On behalf of Telesis Technologies Laboratory, please find enclosed its "Second Progress Report" covering activity for the time period from the initial February 8, 1997, to August 8, 1997. This report is provided in compliance with the conditions set forth in the Experimental Radio Station Construction Permits and Licenses granted on February 8, 1996.

Please stamp and return the provided copy of this transmittal letter to confirm your receipt. Please contact Mal Ziegler at (510) 244-2142 or me should you have any questions or require additional information concerning this matter.

Sincerely,

A handwritten signature in cursive script that reads "Link Brown".

Enclosure

Experimental License Progress Report

August 1997



A Pacific Telesis Company

One of the SBC Companies

Experimental License Progress Report

Telesis Technologies Laboratory (TTL), a subsidiary of Pacific Telesis Group, an SBC company, is filing this third semiannual progress report pursuant to the terms of an experimental license issued February 8, 1996. This report covers activities since our February 1997 report.

Over this period TTL has continued to pursue investigation of the technical propagation issues associated with delivery of multi-channel digital video service. We continued to test with a variety of vendors on PCS rejection of newly designed and modified down-converters. We also have been involved in a variety of interference issues on point-to-point and point to multipoint applications in several frequency bands. The emphasis of our testing during this period, however, has been focused on two-way data transmission using MMDS spectrum.

We have completed entering on a spread sheet all of the data from a very large number of spectrum analyzer plots collected over the last nine months. We have just started analyzing this data. It is too early to draw many conclusions on our two-way experiments, but we plan to issue reports on the various aspects of these studies, shortly. We plan further experimentation based on the conclusions drawn from these reports and, under review, are new projects, in other parts of the spectrum.

We planned to quantify some of the results of the data analysis in this report, but due to a variety of time constraints we must defer this to a later report.

1. Current Trial Activity

This report provides a brief description of TTL's activities since the last progress report - February 1997. The trials in progress, or recently completed, include:

- Investigation of various technical interference issues associated with point-to-point propagation in both the 2 and 11 GHz bands and, additionally, PCS rejection in MMDS down-converters.
- Extended propagation tests of two-way data communications in the wireless cable spectrum (2 GHz) in conjunction with conventional (digital) MMDS video services.
- Field verification of various commercial propagation models used to predict coverage (signal strength).

1.1 Interference testing of various point-to-point and point-to-multipoint channels

- TTL has been investigating propagation of digitally modulated 2 and 11 GHz channels in conjunction with digital wireless cable. These investigations have been mainly concerned with three interference topics:
 - TTL has continued to work with a variety of vendors to verify and quantify PCS rejection of newly designed and modified down-converters. Additionally some similar work, based on rejection of high power, out of band signals of proposed WCS signals.
 - Testing of multipath interference at both MMDS and 11 GHz and identification of out of band interference into MMDS has been examined. Attempts to quantify results and severity to digital, set top units performance have been started and a report is planned.
 - Telesis' attempts to test a digitally modulated compressed video MMDS signal through a repeater has been postponed. Main points to be studied include the effects of low signal level on-pole and off-pole signals on the beam-bender signal with the digital signal. Multipath-path and fade margins will also be considered on this digital signal.

1.2 Two-way MMDS Communications

- To test the concept of two way communications, TTL has located seven low-level transmitters at three locations (within about two miles of each other) in Southern California. These transmitters were set up to use seven of the same frequencies that were being used by the digital MMDS transmitter about seven miles away. Transmit levels were originally set to a 200 milliwatt output level but were reduced to 0 dBm, early in the experiment, to

prevent interference. This still gave a usable signal out to about six miles. This would be adequate when using a sectorized, cell configuration for a data network.

- Analyzer plots and other site information was collected at 300 test locations. Additionally, parameters of MMDS digital video signals in the area were monitored for interference. Preliminary examination of raw data shows some promise for data networks using this approach.
- Additionally, a study of performance based on cross pole discrimination (XPD) was conducted from one of the sites. This involved trying to quantify the depolarization caused by partial blockage caused by trees as well as the polarization effects of being off of the main beam of the transmit antenna. Results, in a worst case scenario, showed an extreme of a negative XPD. In conjunction with this study, a combination of different sectorized transmit antennas from several manufacturers was utilized.
- The data from all of the above has been entered into a data base and will be analyzed shortly. A full report of these experiments is planned and a summary of this report will be included in a future progress report.
- TTL has continued to work with equipment vendors in testing equipment, such as "wireless cable modems" for possible two-way MMDS service.

1.3 Propagation Model - Field Verification

- TTL is assessing the accuracy of new and complex system modeling tools, some of which have not been previously applied to MMDS. TTL's extensive measurements of signal strength and interference are compared with the predicted values from the model to determine the model's accuracy. If the model can be proven to be typically accurate, then TTL will be able to better predict signal levels at various locations without extensive field testing and have confidence in those results.
 - To test these models, over 700 test locations in Northern and Southern California were identified and tested. Spectrum analyzers and plotters were used to collect data. At about half of these sites, signal levels were measured from multiple MMDS transmitters. Preliminary examination of the plots and comparison to values expected from the model indicate a high correlation when buildings and vegetation do not interrupt the line-of-sight. The data still must be extracted from the plots and corrected for known measurement error and then entered in a data base for a complete analysis. This will be detailed in a subsequent report.
 - To try to overcome some of the problems due to the fact that terrain databases do not typically include buildings, trees, and other obstructions, TTL is still considering the use of satellite images and photogrammetry to improve the performance of these models when the point of interest has obstructions both man-made and natural (vegetation). A final area of investigation is the propagation models themselves. Although preliminary results seem promising for a couple of specific methods, TTL still plans to thoroughly check the reliability of these models.
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United States of America
FEDERAL COMMUNICATIONS COMMISSION
EXPERIMENTAL
RADIO STATION CONSTRUCTION PERMIT
AND LICENSE

EXPERIMENTAL
(Nature of Service)

XD FX, MO
(Class of Station)

K M 2 X O F
(Call Sign)

5022-EX-ML-95
(File Number)

NAME TELESIS TECHNOLOGIES LABORATORY

CA

(Location of Station)

Area Of Operation: STATE OF CALIFORNIA

Subject to the provisions of the Communications Act of 1934, subsequent acts, and treaties, and all regulations heretofore or hereafter made by this Commission, and further subject to the conditions and requirements set forth in this license, the licensee hereof is hereby authorized to use and operate the radio transmitting facilities hereinafter described for radio communications.

Frequency	Class	Emission	Authorized
	Stn	Designator	Power watts

See Attached Page 3

Operation: In accordance with Sec. 5.202(a) & (i) of the Commission's Rules.

Special Conditions:

See Attached Page 2

This authorization effective February 8, 1996 and
will expire 3:00 A.M. EST February 1, 1998

FEDERAL
COMMUNICATIONS
COMMISSION



TELESIS TECHNOLOGIES LABORATORY

5022-EX-ML-95

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Special Conditions:

(1) The station identification requirements of Section 5.152 of the Commission's Rules are waived.

(2) Licensee is required to file a PROGRESS REPORT every 6 months from the date of grant. This progress report shall be filed with FCC, Experimental Licensing Branch, Suite 230, 2000 M St., MS 1300E1, Washington, D.C. 20554.

(3) Licensee should be aware that other stations may be licensed on these frequencies and if any interference occurs, the licensee of this authorization will be subject to immediate shut down.

(4) Any operation in these bands must be coordinated with the existing and future users to avoid interference. Emission types may vary under the experiment.

United States of America
FEDERAL COMMUNICATIONS COMMISSION
EXPERIMENTAL
RADIO STATION CONSTRUCTION PERMIT
AND LICENSE

EXPERIMENTAL
(Nature of Service)

XD FX, MO
(Class of Station)

KM2XOF
(Call Sign)

4395-EX-PL-94
(File Number)

NAME TELESIS TECHNOLOGIES LABORATORY

CA
(Location of Station)

Area Of Operation: STATE OF CALIFORNIA

Subject to the provisions of the Communications Act of 1934, subsequent acts, and treaties, and all regulations heretofore or hereafter made by this Commission, and further subject to the conditions and requirements set forth in this license, the licensee hereof is hereby authorized to use and operate the radio transmitting facilities hereinafter described for radio communications.

MHz	Frequency	Emission Designator	Authorized Power watts
	27500.00000-		
	29500.00000	XXX	1.000K (ERP)
	37000.00000-		
	40000.00000	XXX	1.000K (ERP)

Operation: In accordance with Sec. 5.202(1) of the Commission's Rules.

Special Conditions:

- (1) In lieu of frequency tolerance, the occupied bandwidth of the emission shall not extend beyond the band limits set forth above.
- (2) The station identification requirements of Section 5.152 of the Commission's Rules are waived.
- (3) Licensee is authorized to use various emissions and bandwidths during the experiment.

This authorization effective November 7, 1994 and
will expire 3:00 A.M. EST November 1, 1996

FEDERAL
COMMUNICATIONS
COMMISSION

