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PACIFIC TELESIS
Group-Washington

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February 10, 1997

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Common Carrier Bureau
Network Service Division
Office of the Chief

~~Mr. H. Frank Morgan, Chief~~ P MARRANGONI
Experimental Licensing Branch
Federal Communications Commission
Mail Stop 1300E1
2000 M Street, 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"* covers activity for the time period from the initial August 2, 1996, to February 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,

Denice Harris

Denice Harris
Internet: dharris@legal.pactel.com

Enclosure

Experimental License Progress Report

February 1997

TELESIS TECHNOLOGIES LABORATORY℠

A Pacific Telesis Company

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

Over this period TTL has continued to pursue investigation of the technical propagation issues associated with delivery of, multi-channel, video service. Significant attention was paid to the effects of digital modulation on the video signal. Several instances of interference caused by unlikely sources were found and documented. We have worked with a number of equipment manufacturers on solutions to these problem areas as well as on potential new methods for providing video service. We also have undertaken investigation into two-way service separately and in conjunction with video services.

We plan to complete the analysis of the large amount of data collected to date and issue reports on the various aspects of our studies. Further experimentation is contemplated based on these results as well as on new projects, in other parts of the spectrum, that are under review.

Our next progress report will attempt to quantify some of the results of the data analysis and attempt to plot our plans for further experimental activities with radio frequencies.

1. Current Trial Activity

This report provides a brief description of TTL's activities since the last progress report - August 1996. The trials in progress or recently completed, include:

- Investigation of various technical issues associated with wireless cable spectrum (2 GHz), as well as other bands, and the services that potentially could use such spectrum is still in progress.
- Tests to determine the feasibility of two-way 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 Wireless Cable (MMDS) Spectrum

– TTL has been investigating propagation of digitally modulated 2 GHz wireless cable spectrum. These investigations have been centered, to date, on three main topics:

1. Interference

   The most significant item was TTL's identification of interference into MMDS, both analog and digital, set top units causing severe degradation to program material. TTL found that the cause was from out of band signals getting through the down-converter. TTL raised the concern with several vendors, the problem was minimized through a variety of down-converter design changes.

2. Use of a single radial path

   Telesis has been attempting to use a single radial (separate dish antenna) at a multipoint transmit site to tie to another transmit site. This site (#1) uses normal MMDS frequencies and antennas to provide service. The radial receive site(#2) is another MMDS transmitter. also using normal MMDS frequencies and antennas to provide service and a separate dish antenna to receive the radial signal. The point of this system is to more fully use the assigned spectrum by delivering program material to a remote MMDS transmit site. One of the major concerns of this proposal is the need to provide sufficient isolation at the second site to prevent the normal, high power, transmit signal from interfering with the low level radial receive signal.

3. Use of a beam-bender.

   Telesis has been attempting to pass a digitally modulated compressed video MMDS signal through a beam-bender. This investigation has just started and data is now being collected. Main points under review are the effects of low signal level on-pole and off-pole signals on the beam-bender signal with the digital signal. Multi-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. Data is being collected at 300 test locations. Additionally, parameters of MMDS signals in the area are being monitored. TTL has been working 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, about 700 test locations in Northern and Southern California have been identified for testing. Data has been, or is, being collected from these sites. At about half of these sites, signal levels are being measured from multiple transmitters and compared to values expected from the model. 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 considering the use of satellite images and photogrametry to improve the performance of these models when the point of interest has man-made obstructions. A final area of investigation is the propagation models themselves. Although preliminary results seem promising for a couple of specific methods, TTL plans to thoroughly check the reliability of these models.