

Exhibit # 1

Frequency		Power			Emission	Modulating Signal	Necessary Bandwidth (KHz)
(A)		(B)	(C)	(D)	(E)	(F)	(G)
2500-2655	MHz	10 Watts	10 Watts	Mean	K3F	NTSC Video	6000*
2655-2690	MHz	10 Watts	10 Watts	Mean	K3F	NTSC Video	6000*
22.21-22.5	GHz	50 Watts	5000 Watts	Mean	TBD	TBD	TBD
22.5-22.55	GHz	50 Watts	5000 Watts	Mean	TBD	TBD	TBD
22.55-23.0	GHz	50 Watts	5000 Watts	Mean	TBD	TBD	TBD
27.5-29.5	GHz	50 Watts	5000 Watts	Mean	TBD	TBD	TBD
39.5-40.5	GHz	50 Watts	5000 Watts	Mean	TBD	TBD	TBD
40.5-42.5	GHz	50 Watts	5000 Watts	Mean	TBD	TBD	TBD
59-64	GHz	50 Watts	5000 Watts	Mean	TBD	TBD	TBD

* Standard U.S. Television Broadcast Channel

Exhibit # 2

NYNEX Science and Technology, Inc. hereby requests that the Federal Communications Commission append the specified frequency bands to NYNEX Science and Technology, Inc.'s continental U.S. experimental license (call sign KF2XBX and file number 1663-EX-PL-90). These additions will allow NYNEX Science and Technology, Inc. to continue its ongoing investigation of the use of radio technology as stated below.

NYNEX Science and Technology, Inc.'s use of Experimental radio licenses is comprehensive. Its programs include needs for authorities to permit radiations as described in 5.202. Those uses of 5.202 (a) will permit experimentation in scientific or technical radio research of HF, VHF, UHF, and microwave technology. Scientific radio research is used to advance leading edge technology and enrich the body of public knowledge; concurrent with the fundamental studies will be the development of radio techniques to implement the findings of such investigations.

Experimental radio programs of NYNEX Science and Technology, Inc. personnel include testing of equipment in connection with type approval, and development of radio techniques and engineering or operational information for existing or new services.

Finally, in accordance with the rules adopted in FCC GEN Docket No. 90-312, NYNEX Science and Technology, Inc. hereby certifies that neither the applicant nor any party to the application is subject to a denial of federal benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988.

Exhibit # 2

The proposed experimentation program will investigate the factors associated with the use of microwave technologies as a transmission medium for several broadband services, including Video On Demand (VOD), voice, and data applications.

Basic Principle

Using microwave signals, scrambled video information will be sent in a point to multipoint configuration, from a transmitter to geographically disperse receivers.

Transmitted along with the video signals, will be an electronic key that allows only authorized receivers to unscramble the video channels on a "per request" basis. Various methods of signaling from the receivers to the transmitter will be studied, as well as the synchronization problems that develop when audio and video signals are transmitted via different media.

The technical trial for Video On Demand (VOD) will be different from the CellularVision wireless cellular television system in several important ways.

- This will be a hybrid of fiber optics and wireless technologies
- By using fiber optic cables as the main trunks from a central head-end to the microcells, the wireless transmission facilities will be greatly simplified.
- This trial will use miniaturized antenna systems that were originally developed for military applications.
- This technical trial will transmit digital video signals using millimeter wave
- This technical trial will transmit compressed digital video signals using millimeter waves
- This trial will use monolithic microwave integrated circuits (MMICs) as network node components.

Because of their small size and relative ease of operation, MMICs promise the proliferation of microcells, that could be interconnected by fiber optics. Modern video compression techniques will allow very large channel capacities within each microcell.

Experimentation will also examine propagation characteristics, particular for those at and above 28 GHz. It will also examine the use of these higher frequencies for other broadband applications, including "wireless fiber optic" technology. We are meeting with several vendors to discuss potential trials.

Exhibit # 2

Objectives

This program of experimentation will seek answers to the following;

- The feasibility of the fiber optic/wireless hybrid for cellular video transmission, as well as data, voice, and other broadband applications
- The commercial suitability of miniaturized antenna systems that were originally developed for military applications, in video transmission.
- The pros and cons of digital video transmission using millimeter waves.
- The relative effects of digital compression on digital video transmission.
- The viability of using monolithic microwave integrated circuits (MMICs) as network elements
- The effects on picture quality when high-fidelity audio signals are subjected to both digital compression and microwave transmission.
- The effects of relative delay on viewers discomfort level when the video and audio of the television programs are transmitted over different communications media.
- The level of radio frequency interference tolerance and the degree of difficulty in resolving interference problems.
- The effect on picture quality of rain fade and the fade-margins necessary for proper system operation.
- The impact of multipath effects in a wide-bandwidth environment and the relative clarity of mid-band channels compared to those at the upper and lower band edges.
- The problems encountered in the use of orthogonal polarization as a means of signal isolation, when multipath problems are severe.
- Qualitative comparative analysis between video transmission at 2 to 3 GHz range, and video broadband transmission at 22 to 60 GHz range.

Enhancement of Technology

The concept of VOD, for example, is now very popular. However, to date it is mostly associated with fiber optic systems that generally are not expected to permeate local networks for the next five to ten years. The possible applications of wireless microwave technology for this and similar services could have a direct impact on the continued importance of microwave technology, over the next decade.

Digital compression of both video and audio is often used to increase the capacities of various wireline systems. An investigation into the extent to which such increased capacities are applicable to wireless (microwave) transmission should prove worthwhile, especially if it leads to a more efficient use of the radio spectrum.