OET File No. 0123-EX-PL2013
Response to QUESTION 7
Narrative

Deep Space Communications Program Description

A. The complete program of research and experimentation proposed including description of equipment and theory of operation.

Jamesburg Earth Station Technologies LLC (JEST) would like to use the Jamesburg Earth Station (JES) to make directed transmissions in the C-band toward stars with known or suspected extra solar planets. The Jamesburg Earth Station is a historic 98-foot dish located in Monterrey, California that was originally built in 1968 to support the Apollo 11 moon landing. [1]The system can be remotely controlled from any location. Two transmission methods will be employed: 1) FM and 2) CW. The pulse modulated CW signal will have a pulse width of less than 1 Hertz while the FM signal will have a maximum FM deviation of 128 kHz. The system final power amplifier at the antenna feed flange is not to exceed 2 kW. A licensed mobile VSAT will be used for the link between the Jamesburg Earth Station and the Internet.

The program incorporates as its principle component a 29.6 meter (diameter) parbolic casagrain feed antenna manufactured by Philco-Ford located at 37300 Comsat Road in Carmel Valley, California; aka: the Jamesburg Earth Station. The antenna is capable of motorized both horizon-to-horizon (180 degree) elevation and 360 degree azimuth capabilities. The high efficiency solid aluminum main and sub-reflector have been shaped and designed for extreme accuracy. The motorized Vertex 7210 antenna controller includes azimuth and elevation encoders with +/- .001 degree accuracy and up to fifty pre-programmed azimuth/elevation settings linked to the atomic time standard broadcast by WWV.

The range of motion of the antenna during transmissions is limited to the maximum elevation of the horizon terrain plus 4.5 degrees in each of the four quadrants of operation beginning at zero degrees relative to True North and referenced as northwest, southwest, southeast and northeast.

The narrow communications frequency band selected for the satellite transmission is selected as that of the proven deep space communications channel by the larger NASA Goldstone antenna facility. A 175 kHz band from 6,700 MHz to 6,875 MHz will be sufficient for all project transmissions. The spectrum is established by the FCC (47 C.F.R. 2106 as revised May 25, 2012) as “Fixed Satellite Earth-to-Space”. Two transmission carriers are planned for the project: 1) a CW unmodulated carrier pulsed for identification purposes and 2) a 128 kHz FM modulated carrier containing all message data streams. Transmission power will be limited to 2 kW at the antenna flange.

The data transmission path from the New York based servers is via the L3 Communications Internet backbone to dual secured fiber links connected to a satellite uplink in Salt Lake City to secured

[1] The Federal Communications Commission previously issued an International Bureau authorization to AT&T to use this station under call sign KA23. AT&T surrendered its license in 2004. The current experimental application seeks use of the same facilities but for different frequencies and purposes.

encrypted satellite delivered signal direct to the geographically isolated 29.6 meter uplink facility in Carmel Valley, California. The received signal will be modulated by an ICOM ID-1 FM data modulator and transmitted at the FCC approved frequency. Verification of the transmission is accomplished with a feedback loop in the uplink facility to a local server.

The local server provides remote control and programming of the Vertex 7210 antenna controller, the ICOM ID-1 modulator, the Cross Technologies upconverter and 2 kW transmitter. In addition, an on-site satellite engineer will be monitoring all equipment operation during periods that the antenna is in motion and is transmitting. All technical and operational aspects of the project will also be remotely monitored and controlled by an independent third party engineering company with direct satellite connections to the uplink facility.

The transmissions will include a header that is encoded according to a proprietary language based upon fundamental principles of physics and mathematics. Such an encoding scheme could theoretically be deciphered any observers familiar with radio astronomy. These transmissions will also serve as a time capsule because any information encoded with this proprietary scheme will persist in distant space long after human civilization. This transmission experiment represents a continuation and improvement of scientific efforts at searching for extraterrestrial intelligence (SETI) through radio astronomy. A number of similar broadcasts have been conducted over the past fifty years, the most famous of which is “Project Ozma” of 1960, transmitted from the Arecibo radio observatory by astrophysicist Frank Drake. Today we now know of thousands of planets orbiting other stars, an observation unknown to Drake and his contemporaries. JEST would like to use JES to make similar intentional transmissions as Drake and his colleagues, but toward stars known or suspected to harbor extra solar planets.

B. The specific objectives sought to be accomplished.

The project objectives include the establishment of a communications link capable of being received by inhabitable planets throughout the universe.

C. How the program of experimentation has a reasonable promise of contribution to the development, extension, expansion or utilization of the radio art, or is along a line not already investigated.

The Deep Space Communications Project has never before been contemplated or investigated and, as such, represents a significant development, extension, expansion and utilization of the radio art. Upon completion and a demonstration of continuous communications operations, the project establishes Earth as a communications presence in the universe.