

SpaceQuest, Ltd.
3554 Chain Bridge Road
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May 14, 2001

Via Fax and Mail: 202-0418-1918

Mr. Carl Huie
Experimental Licensing Branch
Office of Engineering and Technology
Federal Communications Commission
445 12th Street, S.W.
Room 7A361
Washington, D.C. 20554

Ref #: 1354
File #: 0117-EX-PL-2001
Re: Application for New Radio Station Authorization, Revised Exhibits

Dear Mr. Huie:

Pursuant to the above referenced Application, we are submitting new Exhibits 1 and 2 in replacement of Exhibits 1 and 2 previously filed with the Application and are concurrently withdrawing our request for confidentiality with respect to the attached Exhibits and the Application as a whole. Please destroy the original Exhibits 1 and 2 and refer to the enclosed Exhibits which set forth the particulars of the Application. All attachments to the Exhibits and information provided on FCC Form 442 remain unchanged.

We hope the removal of the confidentiality restrictions will expedite the processing of this Application. Please feel free to call me at 703-352-9728 if you have any questions.

Sincerely,



Linda L. Jacobsen

Cc: Nancy Hey

Exhibit 1
Item No. 3 – Other Particulars - addition

1. Pursuant to its Application for an Experimental License (File Number 0091-EX-PL-1999), on July 28, 1999 SpaceQuest, Ltd. was granted authority, expiring on April 1, 2003, to use and operate the following frequencies for Earth-to-Space communications in the NVNG Mobile Satellite Service:

399.92 MHz
399.955 MHz
399.99 MHz
400.025 MHz

2. Additional information submitted on April 14, 1999 to the FCC Experimental Branch, stated that the company's program of experimental research will operate several mobile transmitters infrequently to

- (1) A simulated satellite receiver in Fairfax, Virginia
- (2) The German SAFIR-2 satellite
- (3) NVNG satellites not yet place into orbit

3. The Company's use and operation of the above authorized radio transmission facilities has conformed to all regulations of the Commission and conditions and requirements set forth in the license. Further, the Company has insured that it has caused no harmful interference to other facilities.

4. As a result of the Company's initial success with its program of research and experimentation as described in Exhibit 1 attached to the above referenced Application, it is now in a position to expand its experimental program and implement Phase 2 testing, as described in Exhibit 2 attached hereto.

5. This current Application for a New Radio Station Authorization therefore addresses Phase 2 of the experimental program. As further explained in Exhibit 2, SpaceQuest requires use and operation of the requested Space-to-Earth frequencies. There are two satellites currently operated by amateur radio operators using assigned amateur radio frequencies. SpaceQuest, Ltd. provided an experimental communications payload for installation in these two small amateur radio satellites, and is seeking FCC authorization to operate those transmitters. SpaceQuest, Ltd. will be control operator for this experimental payload that will operate at 400.575 MHz and therefore seeks an FCC Experimental License to operate the satellite at this frequency. This is a store and

forward satellite where the transmitter is only operated when transmitting stored data in response to a request from the ground station.

6. Portions of the FCC's Table of Frequency Allocations (47 C.F.R. §2.106) relevant to the frequencies applied for herein, are referenced as Attachment A to this Exhibit 1 and include the applicable footnotes of both the ITU's "S" numbering scheme and the old international footnotes. The Table indicates the 400.15-401 frequency band for Mobile Satellites (space-to-Earth) use.
7. With respect to footnotes S5.208A and 647B, there is no possibility of interference with the radio astronomy services in the 400.5625 MHz – 400.5874 MHz band applied for. The radio astronomy service in the bands 150.05-153.00 MHz, 322.0-328.6 MHz, 406.1-410.0 MHz, 608.0-614.0 MHz are far away from the requested SpaceQuest, Ltd. operating bands and the GMSK modulation method used by the SpaceQuest, Ltd. system have very sharp skirts, with 99 percent of the energy falling within a ± 20 kHz bandwidth.
8. With respect to footnote 647B, according to ITU Resolution 46, "coordination of a space station of the MSS (space-to-Earth) with respect to terrestrial services is required only if the power flux-density produced by the station exceeds -125 dB ($\text{W}/\text{m}^2/4\text{kHz}$) at the Earth's surface." The SpaceQuest, Ltd. transmitters will not cause interference with receivers in this band as the received power level on the ground will be below the -125 dB ($\text{W}/\text{m}^2/4\text{kHz}$) limit.
9. With respect to footnote S5.264, coordination of the user downlink frequency band at 400.50-400.65 MHz should not pose a problem. Both Volunteers in Technical Assistance ("VITA") and Final Analysis Communications, Inc. ("Final Analysis") are authorized by the FCC to operate in this band. VITA was allocated spectrum only between 400.505-400.5517 MHz and between 400.5983-400.645 MHz. Final Analysis is authorized to share these bands with VITA's Little LEO system by utilizing time-sharing techniques. However, these frequency bands are outside of the 400.5625-400.5864 MHz operating band requested by SpaceQuest, Ltd. in this Experimental License Application.
10. In addition, Final Analysis was given first priority to apply for a limited amount of downlink spectrum allocated to the Little LEO service in the 400.5517-400.5983 MHz band to the extent that, and for as long as, it is able to operate in this band assigned to the S80-1 system subject to confirmation from the Government of France and until the time the S80-1 system commences operations in this spectrum. However, the allocated spectrum in this band is insufficient for its operational needs, and the FCC has given Final Analysis priority to move to a different band if and when additional Little LEO spectrum becomes available. It is also unclear whether Final Analysis will be able to obtain project financing to

construct and operate its Little LEO system. It is also not known whether the S80-1 satellite system will ever be deployed. Thus, at this juncture, there does not appear to be a need for SpaceQuest, Ltd. to coordinate the use of the requested 400.5625-400.5875 MHz frequency band. Attachment B of this Exhibit 2 references the applicable portions of the FCC Order and Authorization In the Matter of Final Analysis Communication Services, Inc., Adopted March 31, 1998, and the Order and Authorization In the Matter of Volunteers in Technical Assistance, Adopted March 31, 1998.

Exhibit 2
Item No. 10 – Narrative Statement

(a) The complete program of research and experimentation proposed including description of equipment and theory of operation.

1. This information was set forth in Exhibit 1 of the Company's Application for an Experimental License submitted to the Commission on March 11, 1999. A copy of that Exhibit is attached for your convenience as Attachment A to this Exhibit 2.
2. Due to the success of the Company's experimentation program of development and testing of low-cost, low-power user terminals for use on fixed and mobile assets pursuant to the authorization granted by the Commission on July 28, 1999, the Company is now ready to begin the next phase of its experimental program which will involve testing the space-to-Earth segment of its two-way data communications system using non-voice, non-geostationary little low-Earth orbit ("Little LEO") satellites and to begin testing the commercial viability of its innovative system architecture for tracking and monitoring high-value assets through limited market studies using the uplink frequencies already granted and the downlink frequencies applied for in this Application. Therefore, through this Application, the Company desires to expand its experimentation program to include testing of its satellite technology and system architecture concept in conjunction with the inexpensive user terminals with omni-directional antennas which have been under development.
3. SpaceQuest, Ltd. constructed an experimental communications payload for the SO-41 and SO-42 satellites that the Company proposes to use in this next testing phase, as described in Exhibit 1. They were designed to receive data signals from the active user terminals, and polling those from which data is specifically requested. Each satellite stores the data it receives until a Satellite Ground Station is within view, at which time the satellite transmits the collected data to the Ground Station.
4. The satellites that SpaceQuest, Ltd. proposes to use in this experimentation program are carefully designed and optimized for data relay with very low power consumption. Excluding antennas, each satellite is a mere 8-inch cube weighing less than 25 pounds. Despite its small size, each satellite's communications receivers are as sensitive as satellites ten times its size.
5. We intend to conduct research on the efficacy of operating the satellites' high power transmitter only during those times when it is actually communicating

with user terminals, extracting the needed power for the spacecraft from six nickel cadmium batteries, and to then recharge the batteries during the non-operating portion of the satellites' orbit. This research will test the ability of the satellites to service multiple user terminals simultaneously.

6. Approval of this experimental program will enable the Company to complete the necessary experimentation and tests prior to bringing this narrow-band satellite data network into commercial operation which it intends to market under the name Aprize Satellite. SpaceQuest, Ltd. serves as the "technology arm" of Aprize Satellite for satellite development, operations and control.

(b) The specific objectives sought to be accomplished

1. Measure the ability of miniature satellite transceivers to send short packet data to a low-Earth orbiting satellite under actual field operating conditions.
2. Evaluate the reliability of Gaussian Minimum Shift Keying modulation techniques and efficient data transfer protocols when working with a large number of units that transmit very short data packets.
3. Determine the minimum amount of transmitter power required to transfer short data packets reliably to a LeoSat using UHF uplink frequencies.
4. Determine the minimum level of satellite transmit power required to close the link with a user transceiver using an omni-directional antenna.
5. Evaluate a new technique for satellite signal capture and Doppler compensation.
6. Conduct limited field trials with prospective customers to determine the operational performance of the radio equipment and identify potential commercial benefits.
7. Demonstrate the use of a satellite tracking and monitoring system to prospective customers.

(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 line not already investigated.

1. Through its program of design and development, which has been in progress for over six years, SpaceQuest, Ltd. wishes to introduce to the public a whole new class of narrow-band satellite data network services to track and monitor fixed and mobile assets, particularly for the transportation industry.

2. There is a great need and growing public recognition and demand for the type of services that is under development at SpaceQuest, Ltd. Lost and stolen goods have reached crisis proportions on an international scale - \$30-\$50 Billion in missing assets annually. Poor information, or lack of it, on intermodal shipments have resulted in significant spoilage or loss. Inefficient monitoring of hazardous cargo has led to major risks affecting the environment and health. In addition, poor monitoring of cargo has affected the decision-making capabilities of businesses throughout the United States, including those affecting inventory control, personnel efficiency and customer service.
3. Other systems that are now in operation to address these needs have not yet lived up to their promise. Either they have been too costly to develop, deploy and operate, have had serious technical or financial problems, or have limited coverage for the global transportation industry.
4. SpaceQuest, Ltd. has been working to resolve these problems in the provision of tracking and monitoring services and to enter the wireless data communications business by providing low-cost, reliable services that will increase the productivity of businesses, minimize asset losses, improve operations, provide fast, efficient information worldwide, enhance customer service and bring down costs, thus benefiting U.S. businesses and consumers alike.