

Exhibit A
To FCC Form 442 – Experimental License Application
File Number: 0262-EX-PL-2004

1. Background

Hughes Network Systems (HNS) currently builds and sells terrestrial transmitters to a variety of different customers both in the USA and overseas. HNS is seeking through this experimental license application, permission from the FCC to test prototypes, pre-production units and modified production units at its development facility at its Germantown Technical Facility (GTEC), located at 20271 Goldenrod Road in Germantown, Maryland. While most of the testing is done in a laboratory environment, some software and hardware features of new radios require on-air testing in order to confirm correct operation.



Figure 1 – Transmit/Receive Sites

The HNS test facility as designed will consist of six different transmit sites, with five located on the roof of the GTEC Facility and one on the roof of a nearby building belonging to Montgomery College. The six sites are configured into three pairs, with

each of the sites transmitting only in the direction of the other site in the pair. The locations of the six sites are listed in **Table 1** below. The interconnection between the sites is listed in **Table 2**. **Figure 1** illustrates the locations of the different stations (red dots) and illustrates their interconnections (green lines).

Table 1			
Site Locations			
Site	Location	Lattitude	Longitude
		(dd mm ss.s)	(dd mm ss.s)
1	GTEC	N39 11 12.5	W77 14 59.6
2	GTEC	N39 11 12.6	W77 14 59.8
3	GTEC	N39 11 11.8	W77 15 00.3
4	GTEC	N39 11 13.9	W77 15 02.6
5	GTEC	N39 11 13.0	W77 15 03.1
6	MoCo	N39 11 12.6	W77 14 48.0

Table 2	
Site Interconnections	
TX Site	RX Site
1	6
2	4
3	5
4	2
5	3
6	1

2. Equipment

Each transmit site consists of a metal frame facing the paired receive site (see pictures below). This frame can accommodate multiple antennas operating in any of the numerous 12.5 MHz channel contained within the frequency bands listed in **Table 3**. The antennas may consist of high gain antenna having a narrow beamwidth or of sectoral antenna having a wide beam in the azimuth plane. As the number and type of antenna will be modified on a regular basis, it is impossible to provide additional clarity as to the specific antenna and transmitters used at each site.



Figure 2 - Site 2 (GTEC Roof)



Figure 3 - Site 6 (Montgomery College Roof)

2.1 Modulators

The modulators used can be configured to operate using either QPSK, 16 QAM or 64 QAM. Additional types of digital modulation may be included in future equipment designs, however none are planned at present.

Table 3	
Frequency Bands	
Lower Band Edge	Upper Band Edge
(GHz)	(GHz)
38.6	40.0
24.25	26.5
27.5	29.5

2.2 RF Amplifier

The RF amplifier maximum power output is of 20 dBm. However the gain is automatically limited to the minimum power that allows the link to operate with an acceptable Eb/No. This is done to minimize interference and thus to maximize the possible number of terminals that can be deployed in a given area. Full terminal power is only used during fading events or on rare occasions when the power algorithm is being tested.

2.3 Antenna

The antenna used consist of either base station antenna or terminal antenna. Base station antenna has a 3-dB beamwidth of 100 degrees and a gain of 17 dBi in the 24, 27 and 38 GHz bands. The remote terminal antenna has a 3-dB beamwidth of 2.5 degrees and a gain of 35.5, 37 and 40 dBi in the 24, 27 and 38 GHz bands respectively.

2.4 Models

Current AIReach 9400 or 9600 models undergoing upgrades or verification of performance may be tested on the range. As well, unnumbered prototypes and pre-production models may be tested on the range.

3. Coordination

Hughes Network Systems has retained Comsearch for the purpose of coordinating the proposed test range with local terrestrial service operators having licenses in the band. A coordination letter has been sent on 10 November 2004 to operators describing the proposed operation and to which no response has been received as of the date of filing of this application.

Furthermore, as local holders of terrestrial licenses are either current or potential clients of HNS equipment, it is in the interest of HNS to ensure that the traffic of local licensees is in no way impacted by HNS testing. To this end, HNS will conduct tests using the least possible RF power over the shortest possible distance in order not to disrupt any local service. As well, HNS will promptly address any concerns raised by local license holders in order to answer queries about HNS testing or to resolve any possible problem.

4. Radiation Hazard

Hughes Network Systems has done an analysis of the radiation hazard from the transmitters being tested using the methodology in OET Bulletin 65. The transmitted power level at the antenna at the highest power setting is below the FCC threshold for the protection of the general public in all areas except the zone between the feedhorn and the reflector. Specifics of this analysis for each frequency band under consideration are included with the application (Exhibits B, C and D).

As the design of the antenna includes a cover on the parabolic reflector which blocks access to the space between the feedhorn and the parabolic reflector, the public can not access the areas where the limit of 1 mW/cm^2 is exceeded. Furthermore, the transmitters will operate at much lower power levels during normal operation and as well it bears mention that all antenna will be located on the locked roof of two buildings.