

DESCRIPTION OF EXPERIMENTAL PROGRAM

Overview:

Clarity Broadcasting Systems, LLC (“Clarity”) is, through this application, seeking experimental authority under Part 5 of the Commission’s Rules to assess and evaluate the technical equipment that will be used by Clarity for a new ultra-low power, short-range multichannel video distribution system. Under this experimental program, each of three antenna sites will be outfitted with a single transmitter in the 2025-2109 MHz band that will transmit 14 6-MHz channels each utilizing power of 29 dBm (i.e. less than 1 watt) to produce a signal that is received by antennas located approximately 0.7 km away from the transmitter. The received signal will be downconverted and fed into a digital set-top box (off-the-shelf design) that is connected to a standard television broadcast receiver (also off-the-shelf design). Clarity’s receiver unit (consisting of everything from the antenna to the coaxial cable that connects to the antenna input jack on the television) is designed to be installed exclusively in transportation vehicles such as the cabs of commercial trucks and in recreational vehicles, and will function only when those vehicles are stationary (i.e., parked) within a 0.7 km radius of one of the transmitters.

Clarity intends to secure permanent authority from the Commission to offer this new low-power, short-range video distribution offering at more than 250 individual locations in predominantly rural areas spread across the country. Clarity is applying to the Commission for permanent authority to operate its multichannel video distribution system at these locations, and it expects to begin rolling out the offering as soon as Commission authority is received. In its applications for permanent authorization, Clarity proposes to operate its system on a basis where it will avoid causing harmful interference to authorized users of the 2025-2109 MHz band and where it will not claim any protection from harmful interference caused to its transmissions by authorized users of the same band. Although Clarity is required by rule to operate the facilities it proposes in the instant experimental radio service application on such a non-interference basis, one of Clarity’s principal objectives with this experimental program is to develop empirical data that supports its assertion that operation of the proposed system will in fact not cause any harmful interference to authorized users of the 2025-2109 MHz band.

Description of Equipment and Theory of Operation:

Clarity will transmit within the band 2025-2109 MHz. Using a 5:1 digital video compression ratio over 14 channels of 6 MHz each, this 84 MHz of total bandwidth will provide 70 channels of live or pre-recorded television programs into the television broadcast receivers that are connected to Clarity’s in-vehicle receiving system. The use of digital technology reduces both the potential for interference and the amount of spectrum Clarity requires. Emissions would be 6M00D7W for QAM.

Clarity will design and fabricate transmitters, receivers and antennas as follows:

1. The transmitter would be broadband and ultra low in power output per channel. Power output per six megahertz channel would be less than one Watt, and the EIRP would be the minimum amount of power necessary to carry out the service contemplated while, at the same time, preventing any potential interference to other licensees.
2. The receiving down-converter would have low noise figure and sufficient gain to provide clear reception throughout an omnidirectional 1.5 square kilometer area that extends approximately 0.7 km in any direction from the transmitter.
3. The transmit antenna will include the following features as a minimum:
 - a. The horizontal radiation pattern will be omnidirectional so that all receiving systems located within the coverage area would have equal access to the transmissions.
 - b. The peak of the pattern gain will be modest, approximately 10 dBi. This modest gain will produce a wide, half-power, vertical beamwidth and the result would be uniform signal coverage from the headend out to a radial path length of approximately 0.7km.
 - c. Two to four degrees of electrical down-tilt to direct the transmitted signal to the coverage area while, at the same time, limiting signal transmission toward the horizon. This down-tilt would further enhance uniformity of the wanted signal coverage, and it would limit potential interference to other licensees.
 - d. Vertical polarization so as to benefit from the small aperture and highly reliable and highly predictable dipole array design technology.
4. The receive antenna must be small in aperture for convenience and durability as described above. Reasonable gain for such a small size is limited to about 11 dBi. The antenna finally chosen could involve well-known designs including the “corner reflector”, “resonant cavity”, “disc-on-rod”, etc.

Additional information about the transmission system and associated parameters is included in the Attachment to this Exhibit No. 1

Objectives to be Accomplished:

As indicated above, Clarity will soon be seeking permanent Commission authorization for more than 250 transmission systems of the design it proposes in the instant application. Clarity proposes to operate all of these permanent transmitters on a non-interfering/non-protected basis with respect to present and future authorized users of the existing services in the 2025-2109 MHz band. It seeks here to test its assumptions at three locations that are different from each other but representative of the types of interference environments it will encounter at the locations at which it will seek to operate the system. With respect to the receive system, and despite the fact that all of the components are available off-the-shelf today, Clarity seeks to assess the system’s ability to perform as required at the edge of the 0.7 km radius coverage area and under the varying interference conditions that will be observed at the three selected locations.

In addition, Clarity recognizes that the Commission, in October 2004, revised its rules to permit Government earth station operations for TT&C purposes from eleven locations across the country, and to permit secondary Government fixed and mobile services at six sites in the

southwestern United States. *See Amendment of Part 2 of the Commission's Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Services to Support the Introduction of New Advanced Wireless Services, Including Third Generation Wireless Systems*, FCC 04-246 (released October 21, 2004) (47 C.F.R. § 2.106, new footnotes US346 and US393). None of the planned sites are in Utah where two of the experimental operations will occur. Regarding the Frazier Park, California, experimental location, the closest station sites in footnotes US346 and US393 are over 52 miles away and separated by mountains so that distance and terrain shielding preclude interference. Furthermore, while Clarity believes that none of the sites for its anticipated service have the potential to raise interference concerns with the Government stations and systems, the test program here will help determine the ability of Clarity's system to operate in the same bands and area of the newly-relocated Government facilities.

Other Considerations Responsive to Question 7(c) of FCC Form 442:

Clarity has developed a digital system for delivering up to 70 digitally compressed channels of pre-packaged video programming (including standard entertainment and sports fare, as well as a series of channels dedicated to the needs and interests of the vehicular transportation community). Clarity's system represents a new form of video distribution in that the objective is to provide service to a number of very small areas (approximately 1.5 square kilometers each) located at travel plazas and similar facilities frequented by long-haul truckers and recreational vehicle operators. Because of the small coverage area, Clarity is able to use very low power transmission systems and simple, affordable receiving systems for the vehicles. Design considerations followed by Clarity will further mitigate the potential for any interference to be caused to licensees of services authorized by the Commission to operate in the 2025-2109 MHz band.

Clarity is unaware of any program quite like the one it is undertaking. Putative providers of multichannel video distribution services typically want to maximize the area they can serve from a single transmitter, not limit the coverage area as Clarity seeks to do. Clarity advances the state of the radio art by bringing a narrowly tailored, highly desired, and readily affordable video distribution system directly to the places where the customers of the service are congregating. As a result of this experimental program, Clarity will be able to demonstrate that its system does not cause harmful interference to any licensed users of the 2025-2109 MHz band, and will be technically and economically viable.

ATTACHMENT

SIGNAL CALCULATIONS

SPECIFICATIONS

OPERATING FREQUENCIES: 2025-2109MHz
NUMBER OF 6MHz DIGITAL CHANNELS: 14
TRANSMITTER POWER OUTPUT PER CHANNEL: 29dBm
DIGITAL VIDEO COMPRESSION: 5/1
EMISSION DESIGNATOR: 6M00D7W
MODULATION: 64QAM AND 128QAM
BROADCAST ANTENNA:
POLARIZATION: VERTICAL
HORIZONTAL RADIATION PATTERN: OMNIDIRECTIONAL
PEAK OF PATTERN GAIN: 10dBi
CENTER-LINE HEIGHT ABOVE GROUND LEVEL: 24.9 METERS
ELECTRICAL DOWNTILT: 4 DEGREES
E-PLANE BEAMWIDTH (-3dB): 8 DEGREES
NULL FILL-IN: SMOOTH COSECANT-SQUARED

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>AT PEAK OF PATTERN</u>	<u>AT HORIZON</u>
1.	TRANSMIT POWER PER CHANNEL, dBm	29.00	29.00
2.	RF CHANNEL COMBINER LOSS, dB	0.00	0.00
3.	DIRECTIONAL COUPLER LOSS, dB	-0.10	-0.10
4.	COAXIAL JUMPER LOSS, dB	-0.50	-0.50
5.	TRANSMISSION LINE LOSS (7/8" EIA, 25m @ 2.1GHz), dB	-1.57	-1.57
6.	COAXIAL JUMPER LOSS, dB	-0.50	-0.50
7.	BROADCAST ANTENNA GAIN, dBi	10.00	6.00
8.	EFFECTIVE ISOTROPIC RADIATED POWER, dBm	36.33	32.33
9.	FREE SPACE PATH LOSS (1.0km @ 2.1GHz), dB	-98.91	-98.91
10.	RECEIVE ANTENNA GAIN, dBi	3.00	3.00
11.	COAXIAL JUMPER LOSS (integrated down-converter), dB	0.00	0.00
12.	RECEIVED SIGNAL LEVEL, dBm	-59.58	-63.58
13.	JOHNSON NOISE FLOOR (6MHz PASS BANDWIDTH), dBm	-104.72	-104.72
14.	RECEIVED CARRIER TO NOISE RATIO, dB	45.14	41.14
15.	MINIMUM CARRIER TO NOISE RATIO, dB AT 1E-12BER (QUASI-ERROR FREE) FOR 64QAM AND 128QAM	35.00	35.00
16.	FADE MARGIN, dB NOTE: MINIMUM REQUIREMENTS FOR SATISFACTORY SHORT TERM AND LONG TERM PERFORMANCE UNDER ALL ANTICIPATED CONDITIONS IS AN RSL OF -60dBm AND A FADE MARGIN OF 10dB.	10.14	6.14