

VERTEX COMMUNICATIONS CORPORATION  
FCC Application for Experimental License

Exhibit 1

(FCC Form 442-9,10)

Experimentation Program

Vertex is applying here for an Experimental License for a test range on which satellite earth station antennas will be "mapped" for gain patterns at various frequencies. Vertex Communications is now engaged in antenna and feed production only for the 3.7-6.425 GHz, 7.25-8.4 GHz, and 10.7-14.5 GHz commercial frequency bands. In the near future (1-2 years) the 14-20 GHz band will become more and more prominent for commercial use, and Vertex will be developing feeds and antennas for that band also.

In addition, for the support of Harris Government Communications System Division and other customers, Vertex is constantly in need of a test range for the military bands up to 20 GHz and higher. This range will be used for both commercial and government/military product development for at least two years. All Vertex commercial transmitting antennas must pass FCC regulations governing sidelobes, spillover, gain, etc. This range will allow Vertex to qualification tests for these requirements. It will also allow Vertex to develop new feeds and specially shaped main and subreflectors with the specific objectives of achieving maximum efficiency, minimum RF loss, minimum cost and 100% compliance with FCC requirements.

Vertex Antenna Test Range will use a 12 foot diameter transmitting antenna located at the base of a 500 foot tower and aimed up the tower at a passive flat reflector. This reflector then points the signal down range approximately 2 miles to the antenna under test which is at azimuth bearing of  $84^{\circ}$  from true North and elevation of  $-3^{\circ}$  or  $3^{\circ}$  below horizontal from the top of the tower. The test signal can be either horizontally or vertically polarized. The signal may also be right handed or left handed circular depending on the end user of the antenna under test. This is achieved by using appropriate feeds and polarizers.

Exhibit # 1

a. 26'  
 b. 26'  
 c. 50'  
 d. 190'  
 e. 26'  
 f. 26'

Frequency in MHz	POWER			EMISSION	Modulating Signal	Necessary Bandwidth (KHz)
(A)	(B)	(C)	(D)	(E)	(F)	(G)
1450-1500	10 Watts	37.8 - 40.2 dBW	10.5 Peak	AO	CW	<7
1500 - 1700	10 Watts	40.2 - 41.5 dBW	14.1 Peak	AO	CW	<7
1750 - 1870 <sup>50</sup>	10 Watts	41.8 - 42.6 dBW	18.2 Peak	AO	CW	<7
<del>1980</del> 1980 - 2110	10 Watts	43.4 - 44.3 dBW	24.8 Peak	AO	CW	<7
2200 - 2360	10 Watts	44.9 - 46.0 dBW	40.1 Peak	AO	CW	<7
2500 - 2700	10 Watts	46.9 - 48.3 dBW	67.6 Peak	AO	CW	<7

## OBSTRUCTION MARKING AND LIGHTING SPECIFICATIONS FOR ANTENNA STRUCTURES

It is to be expressly understood that the issuance of these specifications is in no way to be considered as precluding additional or modified marking or lighting as may hereafter be required under the provisions of Section 303(q) of the Communications Act of 1934, as amended.

### PAINTING

1 Antenna structures shall be painted throughout their height with alternate bands of aviation surface orange and white, terminating with aviation surface orange bands at both top and bottom. The width of the bands shall be equal and approximately one-seventh the height of the structure, provided however, that the bands shall not be more than 100 feet nor less than 1½ feet in width. All towers shall be cleaned or repainted as often as necessary to maintain good visibility.

### TOP LIGHTING

2 There shall be installed at the top of the tower at least two 116- or 125-watt lamps (A21/TS) enclosed in aviation red obstruction light globes. The two lights shall burn simultaneously from sunset to sunrise and shall be positioned so as to insure unobstructed visibility of at least one of the lights from aircraft at any normal angle of approach. A light sensitive control device or an astronomic dial clock and time switch may be used to control the obstruction lighting in lieu of manual control. When a light sensitive device is used it should be adjusted so that the lights will be turned on at a north sky light intensity level of about thirty-five foot candles and turned off at a north sky light intensity level of about fifty-eight foot candles.

3 There shall be installed at the top of the structure one 300 m/m electric code beacon equipped with two 620- or 700-watt lamps (PS-40, Code Beacon type), both lamps to burn simultaneously, and equipped with aviation red color filters. Where a rod or other construction of not more than 20 feet in height and incapable of supporting this beacon is mounted on top of the structure and it is determined that this additional construction does not permit unobstructed visibility of the code beacon from aircraft at any normal angle of approach, there shall be installed two such beacons positioned so as to insure unobstructed visibility of at least one of the beacons from aircraft at any normal angle of approach. The beacons shall be equipped with a flashing mechanism producing not more than 40 flashes per minute nor less than 12 flashes per minute with a period of darkness equal to approximately one-half of the luminous period.

### INTERMEDIATE LIGHTING (BEACONS)

4 At approximately one-half of the overall height of the tower one similar flashing 300 m/m electric code beacon shall be installed in such position within the tower proper that the structural members will not impair the visibility of this beacon from aircraft at any normal angle of approach. In the event this beacon cannot be installed in a manner to insure unobstructed visibility of it from aircraft at any normal angle of approach, there shall be installed two such beacons. Each beacon shall be mounted on the outside of the tower at the prescribed height.

5 At approximately two-fifths of the over-all height of the tower one similar flashing 300 m/m electric code beacon shall be installed in such position within the tower proper that the structural members will not impair the visibility of this beacon from aircraft at any normal angle of approach. In the event this beacon cannot be installed in a manner to insure unobstructed visibility of it from aircraft at any normal angle of approach, there shall be installed two such beacons. Each beacon shall be mounted on the outside of diagonally opposite corners or opposite sides of the tower at the prescribed height.

6 On levels at approximately two-thirds and one-third of the over-all height of the tower one similar flashing 300 m/m electric code beacon shall be installed in such position within the tower proper that the structural members will not impair the visibility of this beacon from aircraft at any normal angle of approach. In the event these beacons cannot be installed in a manner to insure unobstructed visibility of the beacons from aircraft at any normal angle of approach, there shall be installed two such beacons at each level. Each beacon shall be mounted on the outside of diagonally opposite corners or opposite sides of the tower at the prescribed height.

7 On levels at approximately four-sevenths and two-sevenths of the over-all height of the tower one similar flashing 300 m/m electric code beacon shall be installed in such position within the tower proper that the structural members will not impair the visibility of this beacon from aircraft at any normal angle of approach. In the event these beacons cannot be installed in a manner to insure unobstructed visibility of the beacons from aircraft at any normal angle of approach, there shall be installed two such beacons at each level. Each beacon shall be mounted on the outside of diagonally opposite corners or opposite sides of the tower at the prescribed height.

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8 On levels at approximately three-fourths, one-half and one-fourth of the over-all height of the tower one similar flashing 300 m/m electric code beacon shall be installed in such position within the tower proper that the structural members will not impair the visibility of the beacon from aircraft at any normal angle of approach. In the event these beacons cannot be installed in a manner to insure unobstructed visibility of the beacons from aircraft at any normal angle of approach, there shall be installed two such beacons at each level. Each beacon shall be mounted on the outside of diagonally opposite corners or opposite sides of the tower at the prescribed height.

9 On levels at approximately two-thirds, four-ninths and two-ninths of the over-all height of the tower one similar flashing 300 m/m electric code beacon shall be installed in such position within the tower proper that the structural members will not impair the visibility of this beacon from aircraft at any normal angle of approach. In the event these beacons cannot be installed in a manner to insure unobstructed visibility of the beacons from aircraft at any normal angle of approach, there shall be installed two such beacons at each level. Each beacon shall be mounted on the outside of diagonally opposite corners or opposite sides of the tower at the prescribed height.

10 On levels at approximately four-fifths, three-fifths, two-fifths and one-fifth of the over-all height of the tower one similar flashing 300 m/m electric code beacon shall be installed in such position within the tower proper that the structural members will not impair the visibility of this beacon from aircraft at any normal angle of approach. In the event these beacons cannot be installed in a manner to insure unobstructed visibility of the beacons from aircraft at any normal angle of approach, there shall be installed two such beacons at each level. Each beacon shall be mounted on the outside of diagonally opposite corners or opposite sides of the tower at the prescribed height.

THIS FORM IS A PART OF AND SHALL BE ATTACHED TO THE CURRENT INSTRUMENT OF AUTHORIZATION

(All previous editions should be destroyed.)