0026-EX-ST-2001

814 Madison Road
Eatonton, Georgia 31024

Doug Young
Experimental Licensing Branch
Office of Engineering and Technology
Federal Communications Commission
445 12th Street SW
Washington, D.C. 20554

Dear Mr. Young, 01/04/01

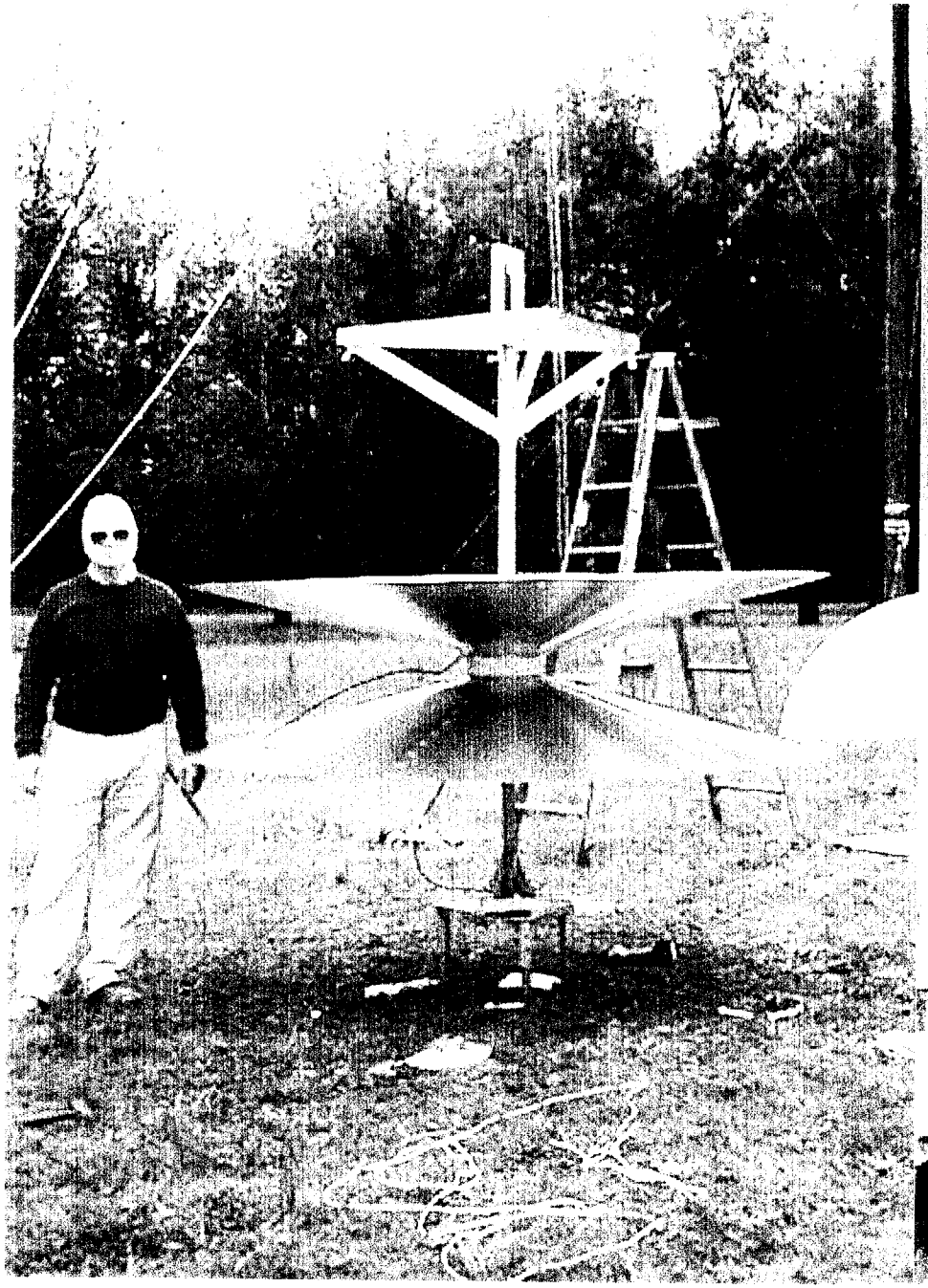
PURPOSE - Please accept this letter, and attachments, as an application for an experimental license to test a new concept antenna. The test need only be for a short time and will be done in rural Georgia with an un-modulated carrier of 100 watts at a frequency of 1590 KHz.

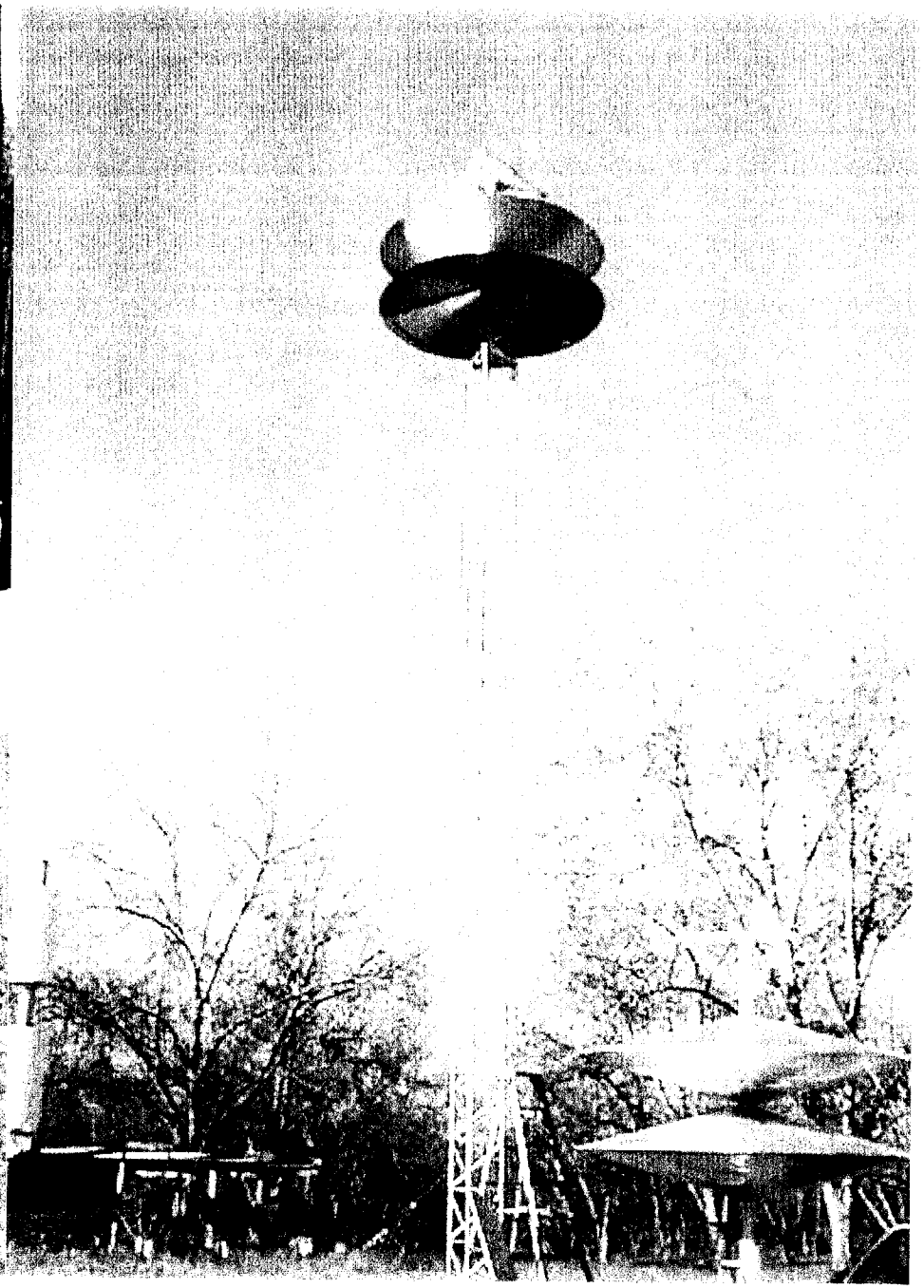
The frequency was chosen so as to prevent any interference to other services as indicated in an attachment, which is a copy of an application mistakenly filed with the Mass Media Bureau of the FCC last August. That FCC file # is BPEX20000828AQC.

THEORY - The antenna to be tested is a new concept in antenna implementation, even though it is based on a fundamental principle of physics - the Poynting Theorem. Simply, when a RF voltage is applied between two cones, an E field is developed in the space between the cones. That same voltage causes a displacement current to flow thru the natural capacity between the cones, thus developing an H field that encircles the space between the cones. Although the E and H fields are properly positioned and satisfy the Poynting theorem in most ways, the two fields are not in time phase. This is due to the fact that the phase of a current thru a capacitor leads the phase of the applied voltage. By installing an external network wherein the current is caused to lag the applied voltage, the Poynting theorem can be satisfied by bringing into time phase the E and H fields within the antenna. For these reasons I have named this antenna the EH Antenna to imply that the E and H fields are developed simultaneously and in a common area that causes the resultant radiation.

The integration of the E and H fields is so efficient that only very small cones are needed, typically having a radius of 0.004 (0.4%) wavelengths. Obviously, the radiation resistance increases as the frequency decreases for a given size cone. Therefore, the instantaneous bandwidth is proportional to the size of the cone and the included angle between cones. For the upper end of the AM Broadcast band, a cone radius of 44 inches allows greater than 20 KHz 2:1 VSWR instantaneous bandwidth, when the included angle between cones is 30 degrees. Since the physical structure is non-resonant, by changing the phasing/matching network, this antenna may be used over a wide range of frequencies. Pictures of this antenna are attached. It follows to reason that a larger antenna is required for the lower portion of the band.

By way of explanation, a "loose" analogy to the EH Antenna is a short section of waveguide, containing the feed, coupled to a horn. The horn causes the antenna pattern to have directivity, thus antenna pattern gain. In the EH Antenna, the radiation is developed in the immediate region of the apex of the cones (where the fields are most intense due to proximity of the apex of the two cones). The remaining cone area allows directing the radiation to provide antenna pattern gain. Previous to the development of the EH





AM Broadcast Version of the EH Antenna

The active cones of the EH Antenna - when completed cover cones are added above and below the active cones to keep out the environment and flying creatures.

The EH Antenna mounted on a 30 foot tower - the lower cover has not been added in this photo. The phasing/matching network is mounted below the lower cone.

Antenna, development of gain within a horn was restricted to physical sizes wherein the horn was multiple wavelengths at the operating frequency. It has been found that, for adequate bandwidth on the AM Broadcast band (+/- 10 KHz 2:1 VSWR) the sloping radius of the cones of an EH Antenna should be greater than 0.0037 wavelengths (44 inches at 1 MHz). This is due to the fact that the EH Antenna develops a TEM mode of radiation and directly couples into the TEM mode of free space.

An included angle of 30 degrees was chosen for AM Broadcast as an engineering compromise, with the trade offs being bandwidth, size and antenna pattern gain. The important aspect of antenna pattern gain in this application is the development of a very narrow elevation beam applied along the horizon. The antenna is non-directional in the azimuth plane. For a given coverage area, this reduces the amount of transmitter power required and virtually eliminates higher angle radiation.

This antenna does exhibit significant gain along the horizon compared to a conventional vertical. This has been proven by comparison tests to such antennas as 1/2 wavelength verticals and 1/4 wavelength verticals on Ham bands using scale models as well as comparing received signal levels from the EH Antenna compared to a 65 foot vertical antenna on the AM Broadcast band. The 65-foot vertical was specifically constructed for this test.

It is also important to note that the E and H fields are almost entirely contained within the physical confines of the antenna, thus Electromagnetic Interference (EMI) is essentially eliminated. Since the E and H fields are not properly time phased for conventional Hertz wire antennas until the fields have propagated about 1/3 wavelengths from the wire (tower), the E and H fields need be very large in the area, thus the cause of EMI. This leads to the concept of placing the EH Antenna on buildings in populated areas such as mid-town. It is in this area that man made noise is greatest, thus the need for maximum radiated field strength, therefore the optimum location for an AM Broadcast station.

REQUEST - It is the intention of this letter to request permission to apply 100 watts of transmitter power to the antenna for the purpose of measuring field strength in accordance with FCC procedures to quantify the performance of this antenna. To ensure that the measurements are performed properly, a Professional Broadcast Consultant (Stu Graham) will perform and validate the field tests. Representatives of the FCC are openly invited to witness these measurements or perform their own.

Since this is a new concept antenna, I would be pleased to travel to the FCC office and present a technical lecture on the subject and discuss this with you. If you desire, I would also be pleased to bring with me the Consultant that will perform the field tests. It would be your choice of date. Also, I would be pleased for personnel from the FCC to visit my "antenna farm", which is about 80 miles south east of Atlanta, Georgia.

ADDITIONAL INFORMATION - I have included a copy of a speech given to the Pennsylvania Association of Broadcasters. That talk was similar to one presented to the National Association of Broadcasters in San Francisco in September and one presented to the Broadcast Section of the Institute of Electrical and Electronics Engineers in October in Washington DC.

I trust that I have included sufficient information. If not, I would be pleased to answer any questions or provide any additional information. To indicate the status of this

new concept antenna, I have included a copy of a patent application made in June 2000. For additional information please see my web site

http://www.netcommander.com/home/w5qjr-/

Sincerely,

Robert T. Hart CEO
EH Antenna Systems
814 Madison Road
Eatonton, GA 31024

The following is a list of attachments to the letter:

The Speech
Request for Special Field Test Authorization
Patent Application for EH Antenna
FCC Form 159 (original sent to Pittsburgh, PA.)