

THE STATE OF NEW HAMPSHIRE

SUPREME COURT

2001 TERM

CASE NO. 2001-440

KOOR COMMUNICATIONS, INC.

v.

CITY OF LEBANON

**BRIEF AMICUS CURIAE OF THE  
SOCIETY OF BROADCAST ENGINEERS, INC. (SBE)**

THE SOCIETY OF BROADCAST ENGINEERS, INC. (SBE), by permission of this Honorable Court<sup>1</sup>, hereby submits its brief *amicus curiae* in support of the interests of its membership in the instant proceeding.

**A. Interest of Amicus Curiae**

The Society of Broadcast Engineers, Inc. (SBE), is a non-profit membership corporation organized under the laws of the District of Columbia. SBE was formed for the purpose of advancement of the interests of broadcast engineers. SBE promotes and advances the broadcast engineering profession through educational and technical programs and endeavors. SBE has established professional education and training for its members to continue to add to and enhance skills in the engineering arts. SBE stimulates interest in the broadcast engineering profession to sustain the profession and conducts advocacy programs on behalf of its members with the broadcast and communications industry, the United States Congress, and the Federal Communications Commission.

This case, as briefed by Koor Communications, Inc. ("KOOR" or "Plaintiff") in its Notice of Appeal, involves an issue that is of clear importance to SBE and its membership. In the proceedings below, the City of Lebanon (the "CITY") argued that its arbitrarily-enacted antenna height limitations do not constitute a bar to installation and operation of AM

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<sup>1</sup> This brief is tendered contingent upon the grant by this Court of a motion for leave to file the same, which is being filed contemporaneously herewith so as to interpose no delay.

broadcast antennas within the municipality. It also argued that there does exist an antenna system design that would allow KOOR to build an antenna for its broadcast facility that would meet the requirements of the current CITY ordinance. As a technical matter, neither assertion is correct.

The ordinance at issue in this case limits antenna height to 42 feet vertical measurement in the only zones in which an AM broadcast antenna may be located. The FCC has granted to KOOR a construction permit, pursuant to its exclusive jurisdiction to regulate the technical aspects of broadcasting. There are numerous cases holding that the FCC has exclusive jurisdiction over technical matters relating to broadcasting. See, e.g. *Head v. New Mexico Board of Examinations in Optometry*, 374 U.S. 424, 431, 83 S. Ct. 1759, 1763 (1963). Whether or not a radio station can be permitted to be operated anywhere in a municipality is without any doubt at all a technical matter within the exclusive purview of the FCC. Section 307(b) of the Communications Act of 1934 [47 U.S.C. §307(b)] requires that the FCC, in considering applications for licenses, and modifications and renewals thereof, when and insofar as there is demand for the same, must make such distribution of licenses, frequencies, hours of operation, and power among the several States and communities as to provide a fair, efficient and equitable distribution of radio service to each of the same.

Here, as in every other licensing situation, the FCC has determined, using formulas developed through the administrative process, that the City of Lebanon, New Hampshire is deserving of an AM broadcast station, which should be a Class B station (station classes are reflective of operating power and frequency, and are tailored to the area to be served and to complicated interference avoidance issues relative to other AM broadcast stations) operating on 720 kHz. In order to protect against interference to other stations, the siting and directionality of the signal are each critical. In this case, the FCC construction permit specifies a directional AM antenna system consisting of four towers, each serving as the antenna itself. Each tower is specified to be of a height of 266 feet, and each utilizing certain ground radials emanating from the base of each of the towers. This allows the antenna to radiate along the ground, as AM broadcast signals are intended to do during the daytime.

Because in AM broadcasting, the tower is the antenna, and because there is an inverse relationship between the frequency of an AM broadcast radio signal and the wavelength of the signal, the antennas must be a certain minimum height in order to radiate. FCC regulations (47 C.F.R. §§73.189 and 73.190) specify, among other things, minimum antenna height, which is frequency dependent. In the case of stations licensed on a frequency of 720 kHz, the minimum antenna height is on the order of 81 meters. The Commission permits an alternative

means of determining the minimum effective field intensity, but that formula would not materially affect the minimum height of the antennas permitted under FCC regulations. Given that the height of the antennas in the case of the construction permit issued by the FCC to KOOR are at or near the minimum height permitted by the FCC regulations, which are not in this case subject to waiver, the antenna height limit of 42 feet in the only zone in which AM broadcast antennas are permitted in Lebanon, New Hampshire effectively constitutes an absolute prohibition of AM broadcasting in the municipality.

SBE is aware that the posture of the City of Lebanon is that there are options available to KOOR to utilize physically short antennas which might meet the 42-foot height limitation. Such is not the case. There are no physically short antennas that could be used at KOOR's station which would meet the antenna height limitation of the City of Lebanon consistent with the legal operation of any AM broadcast station. There was a reference to an "Egyptian" antenna that was physically short. By this, the City can only be referring to a Crossed Field Antenna ("CFA"), with which SBE is intimately familiar.

The CFA antenna is an experimental design. It has been experimented with by amateur radio operators for some years, and is being tested currently in Egypt and Australia. The design was first discussed approximately 12 years ago in Scotland. It is a revolutionary design, discussed in a paper delivered at a convention of the National Association of Broadcasters in 1999. The use of this antenna design has not been approved by the Federal Communications Commission and the claims of its use in other countries are viewed with skepticism by most consulting engineers and antenna experts in the United States. Nor does the design appear to pass muster using any presently known computer modeling software, the most accurate form of antenna system design known at present. Therefore, while the CFA antenna is an interesting subject for debate among engineering experts, and worthy of further experimentation, that or any other physically short antenna cannot substitute for the minimum-height antennas that are called for by the FCC construction permit for this directional antenna facility. The design of any directional AM broadcast station is complex and "tuning" a directional antenna array is critically dependent on the efficiency of the antennas as constructed. If the desired directional pattern cannot be achieved, the station cannot broadcast, due to interference potential to other stations on the same or adjacent broadcast frequencies. FCC technical standards for AM antennas are rigidly adhered to, and are not subject to variation at the whim of a municipality which desires not to permit any antennas at all.

#### **CONCLUSION**

The FCC has determined, as it must in accordance with

Section 307(b) of the Communications Act of 1934, as amended [47 U.S.C. § 307(b)] that the City of Lebanon is deserving of AM Broadcast service, and has issued a construction permit to KOOR in accordance with that statutorily mandated finding. The City of Lebanon antenna ordinance limits the height of AM radio antennas to a height of only 42 feet. This limitation effectively precludes Koor Communications, or any other entity, from constructing an AM radio broadcast facility anywhere in the City of Lebanon. FCC Rules require AM antennas to be of certain minimum heights in order to provide effective, non-interfering broadcast service. The City's antenna ordinance clearly precludes compliance with the FCC technical rules and should be deemed pre-empted. Further, a physically short, crossed field antenna has not been proven to provide effective service and the FCC has not approved the use of these antennas. Thus, the Court should find that the City of Lebanon's antenna ordinance is inconsistent with applicable FCC technical rules and would constitute a complete prohibition of AM broadcast station operation anywhere within the City.

Respectfully submitted,  
**THE SOCIETY OF BROADCAST  
ENGINEERS,**

**INCORPORATED**

By \_\_\_\_\_  
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I hereby certify that two copies of the foregoing brief have been this date mailed to \_\_\_\_\_, counsel for the Plaintiff, and \_\_\_\_\_, counsel for the Defendant.

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Christopher D. Imlay, Esq.

Oral argument is not requested by Amicus Curiae.