# PUBLIC NOTICE

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## MEDIA BUREAU ADOPTS SIMPLIFIED APPLICATION PROCEDURES FOR AM NONDIRECTIONAL KINSTAR ANTENNAS

By this *Public Notice*, the Media Bureau ("Bureau") announces simplified procedures for AM station construction permit applications which specify nondirectional KinStar antennas. Based on its review of the KinStar field tests and submitted reports, the Bureau announces that it will not routinely require the submission of a proof of performance, current distribution measurements, or a formula for the vertical plane radiation characteristic for nondirectional AM facilities which utilize these antennas.

The KinStar antenna, developed by Star-H Corporation and manufactured by Kintronic Laboratories, Inc., is approximately one-third the height of the standard quarter-wave antenna used by many AM stations. The low-profile KinStar antenna affords AM licensees the flexibility to place antennas in areas where taller towers may be unacceptable. In most circumstances, the KinStar antenna also may be more economical to build and maintain than a standard antenna. Applicants may only specify the KinStar antenna for nondirectional use. The Bureau will consider authorizing the use of directional KinStar arrays when more information is available.

The KinStar antenna consists of a cage of vertical wires (usually four), symmetrically arranged around a central support. The vertical wires extend to a height of approximately 0.08 wavelength (75 feet at a frequency of 1000 kHz). Each vertical wire is connected to a horizontal top-loading wire extending to a radial distance of approximately 0.17 wavelength (169 feet at 1000 kHz). The KinStar antenna requires use of the standard 120-radial, one-quarter wave, buried ground system. Attachment A to this *Public Notice* is a report providing details of the construction, modeling, and field testing of the KinStar antenna.

Both field tests and computer modeling using the Numerical Electromagnetic Code (NEC) 4.1 method of moments program indicate that the KinStar antenna produces an essentially omnidirectional radiation pattern in the horizontal plane. The developers' tests also show that the KinStar antenna meets the minimum efficiency for Class B, C, and D stations.[1] The elevation pattern of the KinStar antenna can be represented by the formula in Section 73.160(b)(2) of the Commission's rules for a top-loaded tower, using an effective value of top-loading determined by moment method modeling. AM applicants shall use the manufacturer's computed figures for the efficiency of the antenna and for the effective top-loading.[2]

[1] *See* 47 C.F.R. § 73.189(b)(2)(ii).

[2] *See* 47 C.F.R. § 73.160(b)(2). The effective top-loading, represented by the variable B in the formula, is the difference in electrical degrees between the apparent height and the physical height of the antenna.

The comprehensive report submitted by the antenna developers demonstrates that the radiation patterns of the KinStar antenna do not change significantly as the antenna is scaled at frequencies across the AM band. The report also shows that the performance of the KinStar antenna, built according to the manufacturer's specifications, will comply with applicable rules and will remain consistent for installations at different AM frequencies. Consequently, we will not routinely require the use of current distribution measurements to determine the vertical plane radiation characteristic, commonly referred to as f(θ), or the submission of a proof of performance following the construction of such facilities by AM applicants proposing nondirectional KinStar antennas.

The developers' report also includes NEC calculations of electric and magnetic field strengths near the KinStar antenna, and a comparison of calculated values to the maximum permissible exposure (MPE) limits set forth in 47 C.F.R. § 1.1310.[3] The calculations show that, with power of one kilowatt, the KinStar antenna would produce electric and magnetic field values that exceed MPE limits only in the immediate vicinity of the vertical wires. At a power of 50 kilowatts, the magnetic field exceeds MPE limits at distances of 10 to 12 meters from the center of the antenna. The results are similar to the figures for standard AM antennas in Supplement A to OET Bulletin 65, "*Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Radiation*."[4] We conclude, based on the developers' report, that installation of a fence at the appropriate distance around the KinStar antenna will prevent human exposure to RF radiation in excess of applicable limits, just as in the case of an AM station using a standard vertical radiator. Licensees may establish the distance to the enclosing fence either by RF measurements, made in accordance with the procedures set forth in OET Bulletin 65, or by relying upon the manufacturer's calculations.

For additional information, contact Susan Crawford, Son Nguyen, Ann Gallagher, or Charles Miller of the Audio Division at (202) 418-2700.

By: Acting Chief, Media Bureau

***This Public Notice includes the following attachment:***

***Attachment A: Engineering Report for Experimental Station WS2XTR and Request for Application of 47 CFR 73.160(b)(2) for the KinStar AM Transmitting Antenna for General Use by AM Radio Stations in the United States.***

[3] The Commission's MPE limits are based on the recommendations of the National Council on Radiation Protection (NCRP), the Institute of Electrical and Electronics Engineers, Inc. (IEEE), and the American National Standards Institute (ANSI).

[4] The electric and magnetic field strength graphs for AM antennas given in Supplement A to OET Bulletin 65 were generated by MiniNEC modeling. The KinStar developers duplicated the results shown in Supplement A to test the validity of their model, and used similar techniques to generate results specific to the geometry of the KinStar antenna.