

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
An Inquiry Into the Commission’s Policies)	MM Docket No. 93-177
and Rules Regarding AM Radio Service)	RM 7594
Directional Antenna Performance)	
Verification)	

**REPLY COMMENTS OF THE
NATIONAL ASSOCIATION OF BROADCASTERS**

The National Association of Broadcasters (NAB)¹ hereby files reply comments in the above-captioned proceeding. On behalf of broadcasters, broadcast engineering consultants, and equipment manufacturers (hereinafter “Joint Commenters”), NAB last year filed a proposed criteria checklist for computer modeling of AM directional antenna arrays.² Earlier this year, the Commission invited the public to comment on the proposed criteria checklist.³ In July, the Joint Commenters submitted revisions to the original proposed checklist; at that time we recommended the application of computer modeling

¹ NAB is a nonprofit incorporated association of radio and television stations and broadcasting networks. NAB serves and represents the American broadcasting industry.

² Joint Written Ex Parte Filing – Supplemental Comments of Broadcasters, Broadcast Engineering Consultants, and Equipment Manufacturers, MM Docket No. 93-177, RM-7594, August 2, 2000.

³ *Report and Order and Further Notice of Proposed Rule Making*, MM Docket No. 93-177, RM-7594, March 7, 2001.

for Method of Moment analysis be conditioned on the availability of a free, public domain version of a MININEC software program.⁴

NAB is pleased to announce that two companies, EM Scientific, Inc. and Roy Lewallen, P.E., have offered to make their respective software programs “Expert MININEC Basic” and “EZNEC” available for public domain use at no cost.⁵ In addition, both companies have pledged that as they continue to improve their computational models, they will update the public domain software so that the public will have the benefit of those developments.

By taking a small step forward and allowing the broadcast industry to utilize the efficient techniques offered by Method of Moments antenna array modeling, the Commission will set the stage for better control of AM directional arrays. We are confident that for specific cases meeting the revised criteria checklist, traditional proofs can be superseded by Method of Moments modeling. The value to the broadcast industry will be cost savings and, most importantly, the more efficient use of station engineers’ time and resources in this era of consolidation -- certainly leading to better adjustment and therefore more stable directional antenna arrays.

⁴ Comments of Joint Commenters, MM Docket No. 93-177, RM –7594, July 9, 2001 at 7, 19.

⁵ See Attached E-Mail Correspondence of James Logan, EM Scientific, Inc., Carson City, NV, and Roy Lewallen, Roy Lewallen, P.E., Beaverton, Oregon.

For these reasons and those set forth in our previous filings, we urge the Commission to permit computer modeling to replace field proofs for certain AM arrays.

Respectfully submitted,

NATIONAL ASSOCIATION OF
BROADCASTERS
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John G. Marino
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Henry L. Baumann
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September 7, 2001

From: EMSci@aol.com [mailto:EMSci@aol.com]
Sent: Thursday, August 23, 2001 11:14 PM
To: edelahun@fcc.gov; Marino, John
Cc: hatfield@hatdaw.com; rwa@attglobal.net
Subject: Expert MININEC vs. ELNEC/NEC2

Mr. Edward P. DeLahunt & Mr. John G. Marino,

We are willing to make available a public domain version of Expert MININEC. As discussed by Jim Hatfield, this version of Expert MININEC will have many advantages to the design of Broadcast Antennas. This will be a reduced version of our commercial codes, but will have very powerful features for these types of design problems. This public domain version will be called "Expert MININEC Basic". Please recognize that this code is considerably advanced from earlier versions of the MININEC code, such as the code ELNEC discussed in the e-mail. We have continued to improve the MININEC computational models and this public domain code will have the benefit of those developments. As mentioned in the e-mail, ELNEC and NEC2 had considerable differences for the 180 degree tower. We ran this problem with Expert MININEC Basic and got an answer similar to the given NEC2 answer for the impedance. It may be that a convergence test was not run on the problem with either NEC2 or ELNEC.

We have had some discussions with Richard Adler concerning the distribution of Expert MININEC Basic. It appears that one of the distribution channels could be through the ACES organization.

James Logan
EM Scientific, Inc.

From: Roy Lewallen [mailto:w7el@eznec.com]
Sent: Wednesday, August 15, 2001 8:45 PM
To: Glen Clark; Garrison C. Cavell; Benjamin F. Dawson, P.E.; Edward P. DeLaHunt; Robert W. Denny, Jr. P.E.; Don Everist, P.E.; Robert M. Gates, Jr.; James B. Hatfield, P.E.; Carl T. Jones, Jr. P.E.; Donald L. Markley, P.E.; Marino, John; Charles T. Morgan; Ronald D. Rackley, P.E.; amchristman@gcc.edu; Clarence M. Beverage
Subject: Re: [Fwd: MM Docket No. 93-177/Public domain NEC software]

Hello All,

I've seen differences between MININEC and NEC-2 results on a number of occasions. Most I could attribute to the different classes of problems each program exhibits. For example, MININEC gives erroneous answers for closely spaced parallel wires unless the segment length is no greater than about twice the wire spacing. NEC-2 doesn't require as many segments in this circumstance, but requires that segment junctions in the two wires be aligned. NEC-2 doesn't handle very small loops well; MININEC does. NEC-2 is much more sensitive to source placement. MININEC doesn't give accurate results for wires connecting at an angle unless extremely short segments are used at the junction. And so forth. If a model touches on any of the several conditions under which either program produces errors, results will be different. Otherwise, the programs generally produce virtually identical results. I'll surely defer to the MOM experts, many of whom know a great deal more about the limitations of each program than I do, and to broadcasters who are familiar with the types of models needed, regarding which code is more desirable for your application.

Although I formerly sold a MININEC based program (ELNEC), development on this DOS program ended a number of years ago with the introduction of NEC-2 based EZNEC. EZNEC has since been developed into a Windows program, and it's the basis for future development. My offer to Clarence was to make a special free limited version of EZNEC for satisfying the FCC requirements, but only if the requirements would allow the NEC-2 engine which EZNEC uses. This is because it's simply not practical for me to do additional development work with a MININEC based program.

I'll leave it to you gentlemen to determine whether MININEC or NEC-2 is to be used, on the basis of which best suits your requirements. If NEC-2 is acceptable, my offer stands.

Best regards,
Roy Lewallen