

## DESIGN NOTES

### FCC Agrees to Use Simulation to Replace Some AM Broadcast Field Measurements

In the AM broadcast industry, extensive field measurements have been required to verify proper operation of stations that employ directional antenna systems (multiple tower phased arrays), and some omnidirectional stations that have non-uniform antenna structures (tapered towers or grounded towers with a feed “skirt” system). In a proceeding of September 24, the FCC ([www.fcc.gov](http://www.fcc.gov)) has adopted rule changes (FCC 08-228) that replace those measurements with method-of-moments modeling in certain situations.

The key portion of the rule change is contained in Part 73.151(c), “Computer modeling and sample system verification of modeled parameters to establish operation of a directional antenna consistent with the theoretical pattern.” The new rules establishes a specific set of standards for the phase and current monitoring system, and defines a number of physical/electrical relationships that are dependent on construction methods. Only series-fed radiators are allowed for model-verified antenna systems.

The rule also defines a matrix of impedance measurements made on individual radiators, with the other elements of the array shorted and/or open-circuited. These techniques provide an indirect measurement method for obtaining mutual impedances among the array elements, which is a confirmation by measurement that the elements are operating—as-built—in the same manner as they are modeled.

Field measurements are reduced to a series of at least three points in the directions of pattern minima and maxima. In addition to maintaining operating parameters with the required limits, stations licensed using the method-of-moments criteria must verify the proper operation of the current/phase sampling system, and repeat the field measurements in the originally designated directions, every 24 months.

### New Rules Proposed for “Disturbance of AM broadcast station antenna patterns”

The FCC further sought comments for a proposed rulemaking that would cover structures constructed close to broadcast towers that could interact and alter the radiation of the antenna, whether an omnidirectional and directional antenna systems.

The rule covers the construction of a tower that is within one wavelength of a non-directional station, and at least 60 degrees electrical height at the AM frequency. New tower owners must notify the station and provide an analysis of the impact. A disturbance of 2 dB or more will require detuning of the new tower.

For a tower to be constructed near directional arrays, the required distance is 3 km, and the minimum electrical height is 36 degrees. In this case, detuning is required if the variation “would result in radiation in excess of the AM stations’ licensed standard pattern or augmented pattern values.” The proposed rule also covers procedures for measurement-based licensees, and for modifications made to AM towers.

1. Publication Title		2. Publication Number		3. Filing Date	
High Frequency Electronics		0 2 4 - 3 1 6		September 30, 2008	
4. Issue Frequency		5. Number of Issues Published Annually		6. Annual Subscription Price (If any)	
Monthly-Twelve times per year		12		n/a-None	
7. Complete Mailing Address of Known Office of Publication (Not printer) (Street, city, county, state, and ZIP+4®)					
Summit Technical Media, LLC, 3 Hawk Drive, Bedford, NH 03110-4804					
8. Complete Mailing Address of Headquarters or General Business Office of Publisher (Not printer)					
Summit Technical Media, LLC, PO Box 10621, Bedford, NH 03110					
9. Full Names and Complete Mailing Addresses of Publisher, Editor, and Managing Editor (Do not leave blank)					
Publisher (Name and complete mailing address)					
Scott L. Spencer, PO Box 10621, Bedford, NH 03110					
Editor (Name and complete mailing address)					
Gary A. Breed, 104 S. Grove Street, Mount Horeb, WI 53572					
Managing Editor (Name and complete mailing address)					
n/a					
10. Owner (Do not leave blank. If the publication is owned by a corporation, give the name and address of the corporation immediately followed by the names and addresses of all stockholders owning or holding 1 percent or more of the total amount of stock. If not owned by a corporation, give the names and addresses of the individual owners. If owned by a partnership or other unincorporated firm, give its name and address as well as those of each individual owner. If the publication is published by a nonprofit organization, give its name and address.)					
Full Name		Complete Mailing Address			
Summit Technical Media, LLC		PO Box 10621, Bedford, NH 03110			
Scott L. Spencer		PO Box 10621, Bedford, NH 03110			
Gary A. Breed		104 S. Grove Street, Mount Horeb, WI 53572			
11. Known Bondholders, Mortgagees, and Other Security Holders Owning or Holding 1 Percent or More of Total Amount of Bonds, Mortgages, or Other Securities. If none, check box <input checked="" type="checkbox"/> None					
Full Name		Complete Mailing Address			
12. Tax Status (For completion by nonprofit organizations authorized to mail at nonprofit rates) (Check one)					
<input type="checkbox"/> Has Not Changed During Preceding 12 Months <input type="checkbox"/> Has Changed During Preceding 12 Months (Publisher must submit explanation of change with this statement)					
PS Form 3526-R, September 2007 (Page 1 of 3) (Instructions Page 3) PSN: 7530-09-000-8855 PRIVACY NOTICE: See our privacy policy on <a href="http://www.usps.com">www.usps.com</a>					
13. Publication Title		14. Issue Date for Circulation Data Below			
High Frequency Electronics		August 2008			
15. Extent and Nature of Circulation				Average No. Copies Each Issue During Preceding 12 Months	
a. Total Number of Copies (Net press run)				24217	
b. Legitimate Paid and/or Requested Distribution (By Mail and Outside the Mail)				13517	
c. Total Paid and/or Requested Circulation (Sum of 15b (1), (2), (3), and (4))				14321	
d. Non-requested Distribution (By Mail and Outside the Mail)				9466	
e. Total Non-requested Distribution (Sum of 15d (1), (2), and (3))				9741	
f. Total Distribution (Sum of 15c and e)				24062	
g. Copies not Distributed (See Instructions to Publishers #4, (page 43))				155	
h. Total (Sum of 15f and g)				24217	
i. Percent Paid and/or Requested Circulation (15c divided by times 100)				60%	
16. Publication of Statement of Ownership for a Requester Publication is required and will be printed in the <u>October 2008</u> issue of this publication.					
17. Signature and Title of Editor, Publisher, Business Manager, or Owner				Date	
S. L. Spencer, Publisher				September 30, 2008	
I certify that all information furnished on this form is true and complete. I understand that anyone who furnishes false or misleading information on this form or who omits material or information requested on the form may be subject to criminal sanctions (including fines and imprisonment) and/or civil sanctions (including civil penalties).					
PS Form 3526-R, September 2007 (Page 2 of 3)					