

JAMES B. HATFIELD, P.E.
Electrical Engineer

Education

B.S.E.E., Electrical Engineering, University of Washington, Seattle, WA, 1961
University of Washington - Graduate School of Physics, course in Electrodynamics

Professional Registrations

Registered Professional Electrical Engineer, Washington,
Registered Professional Electrical Engineer, Oregon
Registered Professional Electrical Engineer, Hawaii

Summary

Mr. Hatfield has more than 40 years of experience in the field of electrical engineering. He specializes in electromagnetic analysis and has prepared numerous environmental assessments of the effects of ELF, VLF, MF, VHF, UHF, and microwave electromagnetic fields. He has provided calculations and measurements of electromagnetic fields at AM, FM, television, cellular telephone, land mobile, and microwave installations with reference to emissions from rf heat sealers, power lines, and video display terminals (CRT, VDT) in homes, offices, and industrial environments. Mr. Hatfield has written several papers on modern methods of MW antenna analysis, which he has presented at IEEE Broadcast Technology Society, National Association of Broadcasters, and Applied Computational Electromagnetics Society meetings.

Professional Experience and Accomplishments

Mr. Hatfield is currently a member of three IEEE subcommittees charged with updating the existing ANSI standards with regard to exposure to electromagnetic fields and the measurements of those fields. He routinely leads projects that involve measuring and calculating potentially hazardous electromagnetic fields to determine compliance with regulatory standards, as well as investigations of electromagnetic compatibility and resolution of interference to computing and scientific equipment. He also serves as expert witness in hearings before federal and local agencies. Representative project experience includes the following:

- Project Manager for design of a new 50 kW medium wave antenna system to meet stringent protection requirements for Viacom Radio station KBSG in Seattle, WA. The design included extensive calculation of skywave and groundwave field

strengths, as well as measurements in mountainous terrain to determine the location of service and interference contours.

- Consultant for the preparation of a report for the City and County of Honolulu, HI, on the electromagnetic compatibility of a proposed transmitting facility and its relationship to local land use ordinances.
- Consultant for NIER magnetic (ELF and LF) and electric field measurements, contact and induced current measurements, x-ray, ionizing radiation measurements on transmitter, and measurements of tower lighting circuit insulation resistance at the U.S. Coast Guard LORAN transmission facilities.
- Technical supervisor for the Port of Seattle, WA, project involving analysis and detuning of crane structures that were located near three AM radio towers. Project responsibilities included measuring contact currents, predicting shock and burn hazards for various crane configurations, and recommending techniques to reduce shock hazard to Port personnel.
- Consultant for a project to measure and study non-ionizing electromagnetic radiation (NIER) at Cougar Mountain near Seattle, WA, for FM and TV broadcast stations.
- Engineering consultant to City of Seattle on the NIER aspects of EISs for proposals to increase the heights of television towers in the city. Functioned as technical consultation to create new city NIER ordinance.
- Technical supervisor for specifications and analysis for detuning microwave tower located adjacent to a Coast Guard low-frequency antenna in Pt. Spencer, AK.
- Expert witness for numerous projects to perform radiation hazard analysis and human exposure studies to high-level non-ionizing radiation in school buildings, high-rise office buildings, and industrial buildings.
- Engineering consultant to King County on NIER aspects of proposed new land use policies for telecommunications facilities. Functioned as technical consultation to create new county NIER ordinance.
- Project Manager and design engineer for analysis, preparation of specifications, implementation, and testing for high power multi-tower Medium Wave antenna systems in Auburn, WA, and other locations.
- Consultant to the City of Seattle Office of Long-Range Planning for NIER telecommunications policies.

- Engineering consultant to C.D. Stimson Company for NIER and electromagnetic compatibility studies of high power industrial equipment.
- Engineering consultant to the Fisher Broadcasting (KOMO) for a project involving measurements of NIER levels on Queen Anne Hill in Seattle, WA.
- Consultant for projects involving NIER measurements and serving as expert witness for US West and Cellular One.
- Consultant for a telecommunications facility to prepare non-ionizing radiation predictions, calculations, measurements, and provide expert testimony for more than 100 telecommunications facilities (broadcast, land mobile, cellular, microwave).
- Consultant for a project to prepare measurements and analysis for planning, site management, and remedial measures at multiple-use electronics sites.

Professional Activities

The following subcommittees of IEEE Standards Coordinating Committee 28 (Non-ionizing Radiation) which are charged with revision of various ANSI standards:

- SC-1 Techniques, Procedures & Instrumentation
- SC-3 Safety Levels With Respect to Human Exposure, 0-3 kHz
- SC-4 Safety Levels With Respect to Human Exposure, 3 kHz - 300 GHz

Chairman, Radiation Hazards Subcommittee of the Association of Federal Communications Consulting Engineers

Member, Bioelectromagnetics Society

Member, Applied Computational Electromagnetics Society, IEEE Antenna & Propagation, Broadcast, Electromagnetic Compatibility Societies

Publications (partial list)

Numerical Electromagnetic Code Analysis of AM Directional Antenna Nulls and the Proximity Effect, James B. Hatfield, presented at the September 1987 Broadcast Symposium of the Broadcast Technology Society of the IEEE, Washington, D.C.

Relationships between Base Drives and Fields in Broadcast Medium Wave Directional Antennas, James B. Hatfield, presented at the March, 1988 Conference of the Applied Computational Electromagnetics Society, at the Naval Postgraduate School, Monterey, CA.

Analysis of AM Directional Arrays Using Method of Moments, James B. Hatfield, presented at the April, 1988 Engineering Conference of the National Association of Broadcasters, Las Vegas, NV.

Verifying the Relationships between AM Broadcast Fields and Tower Currents, James B. Hatfield, presented at the March, 1989 Conference of the Applied Computational Electromagnetics Society, at the Naval Postgraduate School, Monterey, CA.

Relative Tower Currents and Fields in an AM Directional Array, James B Hatfield. IEEE Transactions on Broadcasting, vol. 35, No. 2, June 1989.

Using MININEC to Relate Tower Currents to Fields in an AM Directional Array, James B. Hatfield, presented at the September, 1989 Broadcast Symposium of the Broadcast Technology Society of the IEEE, Washington, D. C.

Improved Night Interference Protection, James B. Hatfield, presented at the March 1990 Sixth Annual Conference of the Applied Computational Electromagnetics Society, at the Naval Postgraduate School, Monterey, CA.

A Modern Method of Predicting AM Tower Vertical Radiation, James B. Hatfield, presented at the September 1990 Broadcast Symposium of the Broadcast Technology Society of the IEEE Washington, D.C.

Reciprocity and Moment Methods Applied to Predicting Radiated Emissions, James B. Hatfield, to be presented at the March 1991 9th International Zurich Symposium on Electromagnetic Compatibility, Zurich, Switzerland.

A Comparison of the Fields of a Medium Wave Directional Antenna as Calculated by the FCC Method and the Numerical Electromagnetic Code, James B. Hatfield and Paul W. Leonard, presented at the March 1987 Conference of the Applied Computational Electromagnetics Society, at the Naval Postgraduate School, Monterey, CA.

A Study of AM Tower Base Impedance, James B. Hatfield, presented at the march 1991, 9th International Zurich Symposium on Electromagnetic Compatibility, Zurich, Switzerland.

Nearly Seven Years of Success Using MININEC for analysis and Design of Standard Broadcast Medium Wave AM Directional Antennas, James B. Hatfield, presented at ACES Symposium, March 1994.

Problems with Moment Method Modeling of AM Arrays, James B. Hatfield, presented at the 44th Annual Broadcast Technology Symposium, September 1994.

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New Developments in Moment Method Analysis of Broadcast Antennas, Dr. Richard Adler and James B. Hatfield, presented at the 45th Annual IEEE Broadcast Technology Symposium, September 21, 1995.

Application of MININEC Broadcast Professional for Windows to AM Standard Broadcast Arrays, James B. Hatfield, presented at the Association of Federal Communications Consulting Engineers annual meeting in San Francisco, CA, May 1996.

Computer Analysis of Antenna Systems, Chapter 88, pp. 1353-1367, of the Electronics Handbook, CRC Press, Inc., 1996.