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# NATIONAL RADIO SYSTEMS COMMITTEE



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## MEMORANDUM

**TO:** DAB Subcommittee   
**FROM:** M. Smith, Chairman  
**SUBJECT:** Suspension of activity – IBOC standards-setting process

As a result of growing concerns over the audio quality of iBiquity's low bit-rate codec, the NRSC DAB Subcommittee is temporarily suspending its IBOC DAB standards-setting process. This action is being taken, by unanimous approval of the DAB Subcommittee's Steering Committee, in accordance with the Subcommittee's long-standing goal of supporting the development of a digital radio system offering significant improvements over existing AM and FM analog services.

These concerns have arisen recently, as a result of both information submitted to the NRSC by iBiquity as well as by demonstrations of the iBiquity AM IBOC system at the 2003 CES, at NAB2003, and at the studios of National Public Radio (NPR) in Washington, D.C. The NPR event was a private audio demonstration organized by iBiquity; at that time iBiquity stated the audio being demonstrated was based on the latest version of iBiquity's proprietary audio coding algorithm, PAC, and was the version to be implemented in first generation IBOC receivers.

DAB Subcommittee members who attended the NPR demonstration do not consider the audio quality demonstrated by the iBiquity 36 kbps PAC technology to be suitable for broadcast. This demonstration confirms subjective test data produced by iBiquity and reviewed by the NRSC early in 2003 (iBiquity ultimately withdrew this subjective test data submission from consideration by the NRSC, indicating that improvements to PAC were currently being made).

It should be noted that the NRSC's evaluations, and subsequent positive recommendations, of AM and FM IBOC technology, were based on the iBiquity technology as tested by the NRSC. The vast majority of the data evaluated (and in the case of AM IBOC, all of the data evaluated) was collected on an iBiquity system utilizing an audio coding algorithm different from the algorithm now part of the iBiquity AM & FM IBOC systems.

Furthermore, earlier iBiquity demonstrations of its AM IBOC system incorporating the previous low bit-rate coding algorithm at 36 kbps, as NRSC-evaluated, were highly praised by many NRSC members. Nevertheless, iBiquity has chosen to move forward with its 36 kbps PAC coding technology for use in its AM IBOC system.

The NRSC has long considered flexibility to be an important feature of IBOC digital radio systems, and is concerned that PAC operating at bit rates between 36 kbps and 96 kbps (the maximum coding rate used in

the hybrid FM IBOC system) could also have quality issues that may need to be investigated by iBiquity. The poor performance of the PAC codec at low bit rates raises concerns of performance at intermediate rates, such as 64 kbps. Many ancillary data providers and secondary audio providers propose reduction of the main audio channel to 64 kbps in order to provide these added services. The NRSC is not aware of any testing or public demonstration of the iBiquity system utilizing PAC at these low bit rates. This is an important matter for the NRSC, since the NRSC recently formed a Digital Data Broadcasting Subcommittee to investigate standards-setting for potential datacasting opportunities for both the AM and FM IBOC systems, where data capacity relies on the scalability (i.e. lowering) of the audio bit-rate.

In order to allow time for iBiquity to resolve any matters relating to its audio coding technology prior to continuation of NRSC standardization, the DAB Subcommittee is temporarily suspending its IBOC DAB standard-setting process. The NRSC will consider resuming standard-setting immediately when iBiquity has demonstrated to the NRSC that the audio coding problems of concern have been resolved.

Steering Committee membership:

Charles Morgan, Chairman, NRSC  
Milford Smith, Chairman, DAB Subcommittee  
Dr. Donald Messer, Chairman, Evaluation Working Group,  
and Co-chairman, IBOC Standards Development Working Group  
Paul Feinberg, Co-chairman, IBOC Standards Development Working Group