

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

ET Docket No. 92-298

In the Matter of

Amendment of the Commission's  
Rules to Establish a Single AM  
Radio Stereophonic Transmitting  
Equipment Standard

**SUPPLEMENTAL ORDER**

Adopted: April 12, 1994;

Released: April 28, 1994

By the Commission:

**INTRODUCTION**

1. By this Supplemental Order, the Commission affirms its decision to adopt the Motorola C-Quam system as the standard for the stereophonic AM broadcast radio service. On November 23, 1993, the Commission released a *Report and Order* implementing the C-Quam AM stereo standard. Subsequent to the release of the *Report and Order*, it has come to our attention that a number of comments had been inadvertently overlooked. After review of these additional comments, we find no new evidence or information that warrants a change in our decision in this matter.<sup>1</sup>

**BACKGROUND**

2. In response to the Telecommunications Authorization Act of 1992 (Authorization Act), the Commission adopted a *Report and Order* in this proceeding selecting the C-Quam system as the single AM stereo transmission stan-

dard.<sup>2</sup> Subsequent to the release of the *Report and Order*, it was found that twenty comments had inadvertently not been considered. Most of these comments were improperly or untimely filed.<sup>3</sup> Nevertheless, because other late and improperly filed comments were considered in the *Report and Order*, we have elected to consider all of these comments at this time.

3. All of the previously unconsidered comments oppose the Commission's proposed selection of C-Quam as the AM stereo standard. Most parties generally allege some form of technical superiority of the Kahn system, or conversely, some technical inferiority of the C-Quam system. Specifically, these parties claim the C-Quam system exhibits technical flaws, including "platform motion,"<sup>4</sup> loss of coverage, and increased adjacent channel interference.<sup>5</sup> In addition, some commenting parties recommend that additional testing or evaluation be undertaken.<sup>6</sup> Other parties question the compatibility of C-Quam with future AM band digital audio transmission systems. Hundley Batts Sr. and John Hain, co-owner and chief engineer, respectively, of AM station WEUP, argue that adopting a system other than Kahn's as the standard will force them to re-engineer their station's antenna array.

4. Some parties contend that Motorola unfairly manipulated the market place to create its competitive lead.<sup>7</sup> Jolls asserts that consumers were denied free choice of AM stereo systems because of the non-availability of anything but C-Quam receivers in vehicles. BDI argues that the market penetration of C-Quam is too small for it to be considered a *de facto* standard, and thereby be the primary basis for our decision to select C-Quam as the standard. BDI also asserts that the Commission should mandate multi-system receivers. Cutforth argues that, even with the selection of a standard, other systems should be allowed on a non-interfering basis. Forsman questions the need for an AM stereo standard. Several parties, in supporting the Kahn system, point out the benefits of the Kahn "POWER-side" mode of operation for avoiding adjacent channel interference and easing the tuning of the received signal.<sup>8</sup>

<sup>1</sup> We recognize that, because a petition for review of the Commission's action in this proceeding has been filed, *Leonard R. Kahn v. FCC*, No. 941078 (D.C. Cir. filed 2/7/94), and no petition for reconsideration has been filed, the proceeding is technically no longer before the Commission. Nevertheless, we feel it is important to set forth the Commission's views on the issues raised in the comments that were not previously considered.

<sup>2</sup> See Telecommunications Act of 1992, P. L. No. 102-538. See also *Report and Order*, FCC 93-485 (released November 23, 1993).

<sup>3</sup> Of the 20 comments not considered, 11 were filed after the cutoff date for reply comments and at least 17 were filed without copies as required by Section 1.419 of the Commission's rules. See 47 C.F.R. § 1.419. One additional commenting party, Hazeltine Corporation, was omitted from the comment list in Appendix C of the *Report and Order*, but its comments were fully considered and discussed in the *Report and Order*.

<sup>4</sup> "Platform motion" is a term used to describe a deterioration of the received signal under weak signal, multipath, or interfer-

ence conditions which manifests itself as a shifting of the stereo image between the two channels in an uncontrolled and unpredictable manner."

<sup>5</sup> See, for example, comments of Hughes H. Brewer, Broadcast Devices, Inc. (BDI), E. P. De La Hunt, Joseph A. Dentici, David Smith Forsman, Interstate Broadcasting Company (Interstate), Richard W. Jolls, Robert M. Kanner, Patrick M. O Gara, and Ridgefield Broadcasting Corporation (Ridgefield).

<sup>6</sup> See, for example, comments of BDI, Cutforth, De La Hunt, Dentici, Interstate, Jolls, O Gara, Ridgefield, Sherwood, and WJNR Radio, Inc.

<sup>7</sup> See, for example, comments of Ridgefield and John Bailie.

<sup>8</sup> See, for example, comments of O Gara, Ridgefield, Richard N. Ross, Universal Broadcasting Corporation, and WJNR Radio, Inc. POWER-side operation, as distinct from stereo operation, involves modulating an AM transmitter with two independent sidebands, containing identical program material, but with intentional level and frequency response differences. This system is implemented with a Kahn independent sideband stereo exciter and is claimed to have certain advantages for reception with monophonic receivers, particularly in adjacent channel interference situations.

## DISCUSSION

5. The relative technical performance of the Kahn and C-Quam systems was addressed in the *Report and Order*, including specifically the issues of platform motion, coverage area and adjacent channel performance.<sup>9</sup> With regard to platform motion, we concluded that recent improvements in receiver design mitigate such effects. Modern C-Quam receivers compensate for platform motion by gradually reducing stereo channel separation as signal-to-noise ratios deteriorate, creating a smooth transition to monaural operation when signals are weak. Further, as previously noted, such weak signal effects as platform motion generally occur beyond a station's protected coverage area. Claims of loss of coverage area and increased adjacent channel interference with C-Quam appear to be based on allegations that the C-Quam signal must be modulated at lower levels to avoid excessive bandwidth. As stated in the *Report and Order*, we find no evidence that currently authorized C-Quam equipment violates the Commission's bandwidth requirements when operated properly.<sup>10</sup> The additional commenting parties present no new analysis or measurements to support their claims. We further note that the record contains no complaints of lost coverage from the hundreds of broadcasters currently using the C-Quam system.

6. With regard to suggestions that further testing and evaluation should be performed, in the *Report and Order* we noted that the Motorola and Kahn systems have been tested and comparatively evaluated over the years, and both systems were found to have technical advantages and disadvantages.<sup>11</sup> As stated, we have no reason to expect that further testing would reveal any new information. Moreover, any further testing would lead to additional delays and would be inconsistent with the statutory time restrictions on this proceeding.

7. The issue of compatibility with future AM band digital audio broadcast systems was also discussed in the *Report and Order*.<sup>12</sup> We noted that there is no reason to believe that either the C-Quam system or the Kahn system would have any advantage in compatibility with future digital systems. We further observed that, as we have no specific information on the likely design of such systems, we would not presuppose to consider fairly issues relating to their compatibility with AM stereo technologies.

8. With regard to WEUP's comments that protest the potential costs associated with re-engineering the station's antenna array to accommodate C-Quam transmission, we observe that conversion of any station to any AM stereo system, either initially or from one system to another, will certainly involve re-engineering costs. WEUP's co-owner and chief engineer have not provided any evidence from which to conclude that the conversion cost to the relatively few stations using the Kahn system outweigh the benefits to the public of requiring use of the C-Quam system.

9. We stated in the *Report and Order* that we were not persuaded that Motorola unfairly manipulated the market to deny any segment of the industry or the public a free choice.<sup>13</sup> No new information in the additional comments convinces us otherwise. While vehicular receivers for any

system other than C-Quam may indeed be generally unavailable, this is a result of market choices by vehicle and receiver manufacturers in anticipating the preference of their customers. We disagree that existing market penetration is inadequate to determine whether a *de facto* standard exists. As stated in the *Report and Order*, we find that there was indeed sufficient convergence in the market place toward C-Quam during the past twelve years of unrestricted competition between the systems to conclude that the public interest would be best served by adopting C-Quam as the standard.<sup>14</sup>

10. With regard to the comments that the Commission should mandate multiple system receivers, allow systems other than the standard to be operated on a non-interference basis, or not adopt a standard, we find these positions to be at inconsistent with the Congressional mandate in this matter. Specifically, the Authorization Act requires that we select a single standard for AM stereo.

11. In the *Report and Order*,<sup>15</sup> we determined that stations employing POWER-side operation are not subject to the provisions of the stereophonic transmission standard and use of the Kahn system for such operation could continue. We stipulated, however, that the program material fed to both channels of the exciter must be identical in content. Thus, we believe that the decision made in the *Report and Order* is responsive to those parties wishing to use the Kahn system for POWER-side operation.

12. In summary, we remain convinced that the Motorola C-Quam system is the appropriate choice for the AM stereo standard. We find no arguments in any of the previously unconsidered comments that persuade us to modify any of the decisions previously adopted in the *Report and Order*.

13. Accordingly, IT IS ORDERED that this Supplemental Order IS ADOPTED.

## FEDERAL COMMUNICATIONS COMMISSION

William F. Caton  
Acting Secretary

<sup>9</sup> See, for example, *Report and Order*, at para. 12.

<sup>10</sup> See *Report and Order*, at para. 24.

<sup>11</sup> See *Report and Order*, at para. 12.

<sup>12</sup> See *Report and Order*, at para. 23.

<sup>13</sup> See *Report and Order*, at para. 14.

<sup>14</sup> See *Report and Order*, at para. 16.

<sup>15</sup> See *Report and Order*, at paras. 21-22.