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HEARING ON GENERAL ORDER NO. 7

A public hearing on the proposal of the Federal Radio Commission to amend General Order No. 7, adopted on April 28, 1927, to reduce the allowable frequency deviation from 500 cycles to 50 cycles within the next year was held at Washington on Monday, April 20, 1931. Approximately 100 were present. The hearing was conducted by Chief Examiner Ellis A. Yost.

Not a single objection was voiced to the great bulk of testimony introduced in favor of revision of the order and it was the general impression that the Commission will in the near future adopt an order reducing the permissible frequency deviation from 500 to 50 cycles per second. The order, according to the opening statement made by Commission counsel, would not in any event become effective until a year after the date of its adoption.

The testimony introduced dealt largely with the benefits to be derived from adoption of the order; the availability and cost of equipment; and the ability of the Government to make suitable measurements.

Expected objection to the order did not develop although the Chief Examiner called thrice for statements from opponents to the proposal.

At the close of the hearing there was no indication given as to when the Commission would take formal action upon the proposal.

The National Association of Broadcasters has attempted in this Bulletin to present a full and fair report of the hearing.

Chief Examiner Yost rapped the hearing in order at 10 a.m. and called upon Duke M. Patrick, assistant general counsel of the Commission, to outline the purpose of the hearing and the procedure to be followed. Mr. Patrick pointed out that the hearing was being held under Section 1, subtitle E of General Order 93 and that the proposal under consideration was whether or not after one year from the date of the adoption of the order all stations shall maintain the assigned frequency between the limits of 50 cycles per second above to 50 cycles per second below the assigned frequency. He suggested that Government witnesses be first called to be followed by proponents and later by opponents of the proposal.

Dr. C. B. JOLLIFFE, chief engineer of the Commission, was the first witness. The international need of constant frequency stability was recognized as early as the Washington Conference in 1927, he said, adding that it is in the general public interest that all stations operate at the highest possible efficiency. Heterodyne, he said, was the limiting factor in operation of local and regional stations. The chief engineer read a report prepared by a special committee of engineers and published in the IRE Proceedings (Vol. 18, No. 1, Page 24. January, 1930) in which it was stated that "fifty cycle deviation is not a complete solution of the difficulties that present themselves in broadcasting, but it is a decided improvement since it would reduce the beat note in modern receivers below audibility."

The report from which the chief engineer read was summarized as follows:

1. On the cleared channels the existing plus or minus 500 cycle limit, if adhered to, will practically eliminate beatnote interference to the extent that this is possible with 10 kilocycle channel spacings.

2. On the regional and local channels there is no worthwhile advantage to be gained by setting up more rigorous requirements unless a maximum deviation of plus or minus 50 cycles or less can be attained.

3. It is probable that if frequencies assigned to regional and local services were maintained to plus or minus 50 cycles, a noteworthy improvement in beatnote conditions would be brought about.

4. It is essential in all broadcasting to suppress frequency modulation effects and other short period deviations. A requirement that all stations hold their frequency plus or minus 50 cycles would be helpful in bringing this about.

5. A plus or minus 50 cycle limit is feasible with automatic frequency control devices available today, but a period of at least one year should be allowed to enable all broadcasting stations to become equipped.

Dr. Jolliffe then outlined the questions in issue at the hearing as follows:

1. The necessity for greater adherence to assigned frequency.

2. The feasibility of this proposal in view of the present state of the art.

3. Whether or not the proposed General Order is a reasonable regulation in view of 1 and 2 above with respect to

(a) Rigidity of the requirement

(b) Availability and performance of equipment

(c) Effective date of the regulation

(d) Cost of equipment.

Forty-two stations had expressed their approval of the order, eight of these with minor reservations, in correspondence with the Commission, he said, as compared with six that expressed disapproval.

Dr. J. H. DELLINGER, Bureau of Standards, followed Dr. Jolliffe and outlined the work being performed by the Bureau with respect to the maintenance of a standard primary radio frequency. Three laboratories - Naval Research Laboratory, Bell Telephone Laboratories, and General Radio Laboratories - have established primary frequency standards with accuracy, better than one part in a million, he said. The standard primary radio frequency equipment of the Bureau of Standards is described in detail in the Commercial Standards Monthly (Vol. 7, No. 9, Page 281. March, 1931).

Radio supervisors have been recently supplied with modern equipment capable of maintaining constants of one part in 100,000 which are entirely satisfactory for all practical purposes under present conditions of operation. Dr. Dellinger stated that the Bureau maintains a complete service for checking standards for all transmitting stations and outlined briefly new services which will shortly be inaugurated. He intimated that the Bureau was prepared to aid the broadcasters in conforming with the proposed order.

PHILIP G. LOUCKS, managing director of the National Association of Broadcasters, then spoke briefly expressing the hope that the Commission would continue to hold public hearings before adopting orders of general application and offered a resolution adopted by the Board of Directors of the Association at the Detroit meeting held on March 24, as follows:

"RESOLVED: That the Board of Directors of the National Association of Broadcasters approves of any action by the Federal Radio Commission which, within the limits of mechanical practicability and without compelling the reconstruction of existing broadcast transmitters, will decrease the variation of carrier frequencies, and pledges its cooperation in making such action effective, Provided: that the determination of the minimum frequency deviation which may be permitted is obviously a matter to be determined solely by engineers on the basis of exact information as to the precision, availability and cost of the necessary apparatus both for maintaining frequency and for measuring it."

L. E. WHITTEMORE of the A. T. and T. Company stated that the views of the Western Electric Company and the Bell Telephone Laboratories would be presented by E. L. Nelson and G. A. Young.

EDWARD L. NELSON of Bell Laboratories stated that the proposed order was fundamentally sound and does not involve precision unknown to the industry generally. Intrachannel beatnote will be rare, probably about 10 or 20 cycles, with 50 cycle deviation, he said. A great improvement in service would result with 50 cycle deviation whereas if 100 or 250 cycle deviation were permitted the public would doubtless be unable to notice any improvement in present service. The investment required would be comparatively small when measured against the improvement in service which would result. Mr. Nelson declared that there was no major obstacle in the way of accomplishing the result intended by the proposed order although he admitted that many stations would be required to make changes in equipment. Mr. Nelson cited numerous measurements made by Bell Laboratories over a period of two years to support his statements. Competent operators must be in charge of station equipment if frequency stability is to be maintained, he said, noting that General Order 106 will require frequent checks and aid materially in frequency maintenance.

Questioned closely, Mr. Nelson declared that the proposed order would not work undue hardship upon local or regional stations and that the outlay would be more than justified with the resulting improvement in service.

G. A. YOUNG of Western Electric Company stated that his company has manufactured equipment which will enable stations to comply with the proposed order. Much of Mr Young's testimony dealt with cost data.

J. B. COLEMAN of RCA-Victor Company stated that within the good service of a station there would be a definite improvement in reception although in what is known as the "mush area" the flutter effect would be more noticeable than at present. He stated that his company was prepared to deliver equipment necessary to maintain the proposed standard although he was unable to state costs. He said the cost would be fixed to meet competition in the field.

Mr. Yost called for a representative of the DE FOREST COMPANY but there was no response.

J. W. HORTON of General Radio Company spoke briefly about frequency standards and the work his company has been doing. He added that his company manufactures monitoring equipment which he then described. To obtain satisfactory results, he said, the co-operation of all stations will be necessary.

T. A. M. CRAVEN, consulting radio engineer, Washington, D. C. testified that it was his opinion that not only is such an order practicable but that it is also necessary in the interest of the public as well as of nearly every regional and local station. It will be one of the greatest advances since 1927 toward improving the radio broadcast situation, he said. Precise frequency control in the order of 50 cycles will eliminate much of the heterodyne now existing between stations assigned to the same frequency, he said, and this in turn will result in an increase of the night service area at each of such stations as well as improve greatly the character of reception in the present night service area. It will permit a little closer geographical spacing between stations assigned the same frequency especially when such stations utilize "chain" programs. It will also permit of other applications such as improved service by increased power in certain localities, or by adding stations on the same frequency where the geographical spacings will permit. Evidence is available, he said, to the effect that:

1. The proposed order will improve broadcasting service to the public.

2. The enforcement of the order is both practicable and necessary.

3. The equipment is available from more than one manufacturer and is current good engineering practice.

4. The cost is reasonable.

5. The order is in the interest of both the public and the broadcasters.

A. B. CHAMBERLAIN, chief engineer, Columbia Broadcasting System, said he had made a check of all Columbia stations and that 41 said they were in a position to meet the requirements of the order, 22 were undecided as to their position and that 13 stated they were unable to meet the order's requirements. He said that if the order were to be put into effect there would be a noteworthy improvement with resulting greater fidelity of reception to the listening public.

CLARENCE M. TAUBEL, president William Penn Broadcasting Company, Philadelphia, Pa. said that his company operated a local broadcasting station and that it was his belief that owners of radio stations ought not to object to any reasonable requirement such as the proposed order especially since the cost is reasonable and should be a profitable investment compared to the return which might be expected from the resulting improved public service.

CHARLES W. HORN, general engineer of the National Broadcasting Company, stated that requirements of the order could be met but actual results depended upon competent operators being in charge of equipment. He pointed out that a condition termed "wave wobble" due to carriers being out of phase was as bad as beatnote although this usually occurred out of the good service areas of stations. Mr. Horn said that enactment of the order would make conditions better but felt that it was not desirable to have less than 10 kc separation between stations and did not believe that adoption of the order would pave the way for new stations.

W. C. BRIDGES, Station WEBC, Superior, Wisconsin, said that his station as well as all other regional stations and the listening public will be benefitted by the order.

CARL BUTMAN, radio consultant, read letters from two stations, one of which stated that the permissible deviation should be 100 cycles and the other stated that a percentage of the assigned carrier should be the determining factor.

Chief Examiner Yost then called for witnesses who desired to testify in opposition to the order. It had been circulated in the hearing room that a group of stations would oppose the order but Chief Examiner Yost's call went unanswered.

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