

BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION

WASHINGTON 25, D.C.

<p>In the Matter of AMENDMENTS TO THE COMMISSION'S RULES AND REGULATIONS GOVERNING SHARING OF TELE- VISION CHANNELS AND ASSIGNMENT OF FRE- QUENCIES TO TELEVISION AND NON-GOVERN- MENT FIXED AND MOBILE SERVICES</p>	}	Docket No. 8487
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REPORT AND ORDER

(May 5, 1948)

BY THE COMMISSION (COMMISSIONER WEBSTER NOT PARTICIPATING;
COMMISSIONER JONES DISSENTING IN PART):

This proceeding arose on a Notice of Proposed Rule Making issued August 14, 1947, relating to frequency allocations in the bands 44 to 88 megacycles and 174 to 216 megacycles, Pursuant to the terms of the notice and at the request of interested persons a hearing and oral argument was held before the Commission en banc on November 17 to 21, 1947. The decision herein is based upon the testimony and exhibits introduced at that hearing.

There are three principal problems in this proceeding which the Commission must decide, They are:

- (1) Sharing of Television Channels.
- (2) Allocation of the band 72-76 megacycles.
- (3) Delegation of a Television Channel.

These subjects will be considered in the above order.

I. Sharing of Television Channels

Under the present allocation, all of the television channels except No. 6 are shared with other services. Television channels 1 through 5 and 9 through 13 are shared with non-government fixed and mobile services and channels 7 and 8 are shared with government fixed and mobile services. Under the Notice of Proposed Rule Making it was proposed to eliminate sharing on all television channels except 7 and 8. At the opening of the hearing, it was announced that the Inter-department Radio Advisory Committee had advised the Commission that sharing on channels 7 and 8 could also be deleted if the Commission deleted the sharing requirements on the other television channels.

The evidence introduced at the hearing by both the Commission and private parties showed beyond any doubt that the shared use of television channels was not feasible. Destructive interference would be caused to television reception over large areas from either fixed or mobile stations operating on the same or adjacent channels. An

attempt was made to show that some shared use of these channels would be possible on the basis of an engineered assignment plan. The difficulty with this proposal is that an engineered plan presupposes a freezing of the entire television allocation plan so that it would prove extremely difficult to make any alterations in the plan necessary to meet changing conditions. Moreover, even an engineered assignment plan would not make possible joint use of the same spectrum space in the congested areas where the real need for frequencies is the greatest.

For the foregoing reasons, the Commission is convinced that sharing of all television channels should be abolished. The revised allocations showing this change are contained in Attachment A.

II. Allocation of the Band 72-76 megacycles

The band 72 to 76 megacycles, except for the guard band around the 75 Mc marker, is presently allocated to non-government fixed and mobile services. It is in between television channel No. 4 (66 to 72 Mc) and No. 5 (76 to 82 Mc) and hence is a source of potential adjacent channel interference to each channel. The evidence showed that at least so far as mobile operations are concerned, operation in this band is not feasible since destructive interference to television reception is inevitable. However, the evidence did show that some use can be made of these frequencies with no interference to television on the basis of careful engineering and the formulation of engineering and interference standards. The establishment and application of such standards appear to be capable of solution for the fixed service. They do not appear to be practical in the case of the land mobile service whose requirements are most acute in the same areas which require either television channels 4 or 5, or both. Accordingly, the Commission has determined that the frequencies 72 to 76 megacycles should be assigned only to the fixed service on an engineered basis and on condition that no adjacent channel interference will result to the reception of television stations which may be authorized or provided for in the Commission's Rules. The Commission recognizes that this allocation does remove some of the flexibility in the television allocation table but this is restricted to television channels 4 and 5 and not all the television channels, as would be the case if assignment were made for shared use of television channels on an engineered basis. Moreover, if the band 72 to 76 megacycles is not to be used by the fixed service on an engineered basis, it would be difficult to assign any service therein. This would constitute a waste of frequencies.

The Commission recognizes that some stations in the land mobile service were authorized in the 72-76 Mc band before the Notice of Proposed Rule Making in this proceeding was issued. As to these stations, it is the Commission's intention, as set forth in the Notice of Proposed Rule Making in this proceeding, to permit their continued operation for a period of five years from the date of this report in order to provide for the amortization of existing equipment. No new stations in the land mobile service will be authorized in this band except where it can be shown that additional stations are required for the satisfactory operation of a system already authorized for

operation in the 72-76 Mc band and that no adjacent channel interference will result to the reception of television stations which may be authorized or provided for in the Commission's Rules. These additional stations, however, will be permitted to operate on frequencies 72 to 76 megacycles only until five years from the date of this report.

III. Deletion of a Television Channel

As can be seen, the action of the Commission eliminating shared use of television channels and restricting the use of the band 72 to 76 megacycles to fixed circuits on an engineered basis results in a marked diminution in the number of frequencies available for the fixed and mobile services. In order to provide for the needs of these services, the Commission's Notice of Proposed Rule Making proposed the deletion of a television channel and its allocation to the fixed and mobile services.

Representatives of the television industry objected to the deletion of one of their channels, but admitted that 12 exclusive television channels were preferable to 13 channels, 12 of which were subject to sharing. As has already been pointed out, the Commission does not believe that sharing is feasible. In order to meet the needs of the other radio services, the Commission is of the opinion that television must surrender a channel so that provision can be made for the needs of these other services which were to have been accommodated in the band 72 to 76 megacycles and on a shared basis in the television channels. The Commission appreciates the fact that this action does make more difficult the establishment of a nation-wide television system on frequencies below 300 megacycles. However, the Commission is convinced that, on an overall basis, a generous allocation has been made for broadcasting, including television, and that the needs of the fixed and mobile services cannot be overlooked. The Commission reiterates its opinion as expressed in its May 25, 1945, Allocations Report¹ that there is insufficient spectrum space below 300 megacycles to make possible a truly nation-wide and competitive television system and that such a system must find its lodging higher in the spectrum where more space exists.

¹ The Report reads as follows (pp. 99-100):

"As was pointed out in the proposed report, the Commission is still of the opinion that there is insufficient spectrum space available below 300 megacycles to make possible a truly nation-wide and competitive television system. Such a system, if it is to be developed, must find its lodging higher up in the spectrum where more space exists and where color pictures and superior monochrome pictures can be developed through the use of wider channels. In order to make possible this development of television, the Commission has made available the space between 480 and 920 megacycles for experimental television. The time which may elapse before a system can be developed to operate on wider channels on these ultra-high frequencies is primarily dependent upon the resourcefulness of the industry in solving the technical problems that will be encountered. In this portion of the spectrum it is contemplated that the Commission will license the entire band between 480 and 920 megacycles for experimental television and will not designate any particular channels. Applicants desiring to operate in this portion of the spectrum should consult with the Chief Engineer as to the exact frequency band they should utilize.

"The Commission repeats the hope expressed in its proposed report that all persons interested in the future of television will undertake comprehensive and adequate experimentation in the upper portion of the spectrum. The importance of an adequate program of experimentation in this portion of the spectrum cannot be over-emphasized, for it is obvious from the allocations which the Commission is making for television below 300 megacycles that in the present state of the art the development of the upper portion of the spectrum is necessary for the establishment of a truly nation-wide and competitive television system."

In the Commission's Notice of Proposed Rule Making the television channel proposed for deletion was No. 1. At the hearing the American Radio Relay League recommended that Channel No. 2 be deleted. The League based this recommendation on the fact that the harmonics of an amateur band and of industrial, scientific and medical devices would fall in Channel No. 2 and largely destroy its usefulness. The League further pointed out that improvements in receiver design can obviate or minimize adjacent channel problems but that no change in receiver design will eliminate the effects of harmonics; the harmonics must be suppressed. The arguments advanced by the League have considerable merit and have been carefully considered. The Commission has concluded that no perfect solution exists. On the whole many of the problems in this portion of the spectrum are the result of the interspersed nature of the frequency allocations. If television channel No. 1 is deleted, channels 2 through 6 are substantially one block. If television channel No. 2 is deleted, and channel No. 1 is retained, there will be boundary problems for two channels; channel No. 1 will have adjacent channel interference on two sides and channel No. 3 will have it on one side. Viewing all factors the Commission finds that a better allocation will result if television channel No. 1 is deleted. Representatives of the television industry were also of the same opinion.

The Commission is aware of the fact that this decision, meaning as it does that every effort will have to be made to suppress harmonics as much as possible, will cause some misgivings to the amateurs operating in the 28-29.7 Mc band whose harmonics may cause interference to television channel 2. The Commission believes that harmonic interference problems are to be expected generally throughout the upper spectrum and Commission Rules requiring harmonic suppression will be equitable in their application to the several services. Moreover, a degree of harmonic suppression will not be required of amateurs which is unrealistic or not applicable to other services, considering the peculiarities of each such service.

There remains for decision the question as to the service to be allocated to the deleted television channel. In the Notice of Proposed Rule Making, it was proposed to assign the band to the fixed and mobile services. At the hearing, representatives of the FM industry urged that it should be utilized for FM purposes. As the Commission understands this contention, no request is made in any way to change the basic allocation of 88 to 108 megacycles for FM broadcasting. Although a request was made for a permanent FM assignment in the 50 megacycle band—and as to this request the Commission strongly reiterates its previous decision concerning FM allocation—the contention that was advanced with most earnestness and seriousness relates to the use of the band 44-50 Mc for relay purposes in order to facilitate network programming.

The public welfare and national security necessitate arriving at an allocation at the earliest possible date for the fixed and mobile services engaged in safety and protective activities. Hence, it is essential that FM stations dependent upon certain other FM stations in the 44-50 Mc band as a program relay facility must look to other

facilities for program relaying. Therefore, the band 44-50 megacycles is allocated to the fixed and mobile service.² The specific allocations in this band are set forth in a Notice of Proposed Rule Making adopted today.

So far as network programming of FM stations is concerned, the Commission believes that, in general, common carrier facilities will be used for this purpose. Moreover, as in the case of television, the Commission is proposing a modification of its rules so as to permit intercity relaying of FM programs on frequencies allocated for FM STL purposes, 940-952 Mc. Finally, it should be pointed out that nothing in the Commission's Rules prevents FM stations in the band 88-108 Mc from rebroadcasting the programs of other FM stations as is presently being done.

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The Notice of Proposed Rule Making contained a revised table showing how the 12 remaining television channels would be assigned to the metropolitan districts in the United States. Upon further consideration of this matter, the Commission is of the opinion that other changes appear necessary in the table which should be the subject of proposed rule making. Since these changes may have some bearing on the particular assignments contained in the Notice of Proposed Rule Making in this proceeding, it is believed that the fairest and most efficient procedure would be to incorporate all of these proposed changes in the assignment table into one Notice of Proposed Rule Making. Such a notice is being issued simultaneously with the release of this report.

Accordingly, *It Is ordered*, this 5th day of May, 1948, that the allocation table and rules and regulations be amended as set forth in Attachment A, effective June 14, 1948.

DISSENTING OPINION OF COMMISSIONER JONES

I agree that a need has been shown for the allocation of more frequencies for the use of the safety and special services in that portion of the spectrum below 300 megacycles.

However, it seems to me that the time has come when the Commission should provide more than a temporary home for not only those services but for the FM service and the television service and other services incidental thereto.

Since the end of the last war a great portion of the frequency spectrum, theretofore unused, has been opened, due largely to war-time developments. The Commission has held a number of frequency allocation hearings in attempts to determine what frequencies should

² After the close of the hearing, Major Edwin H. Armstrong on December 31, 1947, filed a petition to re-open the hearing so that he could further cross examine Commission witnesses in connection with the accuracy and reliability of Exhibits 52 and 52A in order to investigate further any differences between the measurements conducted by Major Armstrong at West Hampton Beach and the field tests of the Federal Communications Commission. The Commission is of the opinion that it is not necessary to reopen the hearing on this issue since the decision to allocate 44 to 50 Mc to the non-government fixed and mobile services is not based upon any comparison of measurement data concerning coverage of FM stations in the band 44-50 Mc or in the band 88-108 Mc but rather on the basis of the urgent need of additional frequencies by the non-government fixed and mobile services. Accordingly, the petition is dismissed.

be allocated to which services. After allocations of frequencies have been made, problems have been recognized and major allocation changes have been ordered. This has not resulted in the stability necessary for the proper promotion of the new services. Particularly has FM and television been adversely affected. Public benefits have been unnecessarily delayed and confusion has arisen.

In view of the history of allocation decisions and changes during the past several years, I am convinced that while it might be expedient, it nevertheless would be unwise now to make any sub-allocation of the 44-50 megacycle band until a thorough and careful hearing is held and a determination reached regarding the interference problems that may be experienced on all of the frequencies below 300 megacycles. Only after such hearings and findings should the Commission make the necessary comparative determinations looking to long range rather than temporary frequency allocations for all of the services involved.

ATTACHMENT A.—Revised table of frequency allocations—44-88 and 174-216 Mc

Band Mc	United States Service-Allocation	Remarks
44-50 (Note A).....	Non-Government: (a) Fixed..... (b) Mobile.....	
50-54.....	Amateur.....	
54-72.....	Non-Government: 54-60 Mc Television Broadcasting Channel 2..... 60-66 Mc Television Broadcasting Channel 3..... 66-72 Mc Television Broadcasting Channel 4.....	
72-76 (Notes B, C).....	Non-Government: (a) Fixed.....	Aeronautical markers to remain on 75 Mc as long as required or until moved to another suitable frequency.
76-88.....	Non-Government: 76-82 Mc Television Broadcasting Channel 5..... 82-88 Mc Television Broadcasting Channel 6.....	
174-216.....	Non-Government: 174-180 Mc Television Broadcasting Channel 7..... 180-186 Mc Television Broadcasting Channel 8..... 186-192 Mc Television Broadcasting Channel 9..... 192-198 Mc Television Broadcasting Channel 10..... 198-204 Mc Television Broadcasting Channel 11..... 204-210 Mc Television Broadcasting Channel 12..... 210-216 Mc Television Broadcasting Channel 13.....	

Note A.—Continued temporary operation of the FM broadcasting stations listed below may be authorized until December 31, 1948, or until a sub-allocation of this band to the fixed and mobile services has been made final and effective by the Commission, whichever date is earlier.

Station	Location	Temporary frequency
WTIC-FM.....	Hartford, Connecticut.....	45.3
WDRC-FM.....	Hartford, Connecticut.....	46.5
WGNB.....	Chicago, Illinois.....	45.9
WEFM.....	Chicago, Illinois.....	45.1
WOWO-FM.....	Ft. Wayne, Indiana.....	44.9
WABW.....	Indianapolis, Indiana.....	47.3
WMNE.....	Portland, Maine.....	45.1
WBZ-FM.....	Boston, Massachusetts.....	46.7
WBZA-FM.....	Springfield, Massachusetts.....	48.1
WGTR.....	Worcester, Massachusetts.....	44.3
WWJ-FM.....	Detroit, Michigan.....	44.5
W2XMN.....	Alpine, New Jersey.....	44.1
WNEF-FM.....	Binghamton, New York.....	44.9
WQXR-FM.....	New York, New York.....	45.9
WABF.....	New York, New York.....	47.5
WHFM.....	Rochester, New York.....	45.1
WBC.....	Schenectady, New York.....	44.7
WELD.....	Columbus, Ohio.....	44.5
WFIL-FM.....	Philadelphia, Pennsylvania.....	45.3
KDA-FM.....	Pittsburgh, Pennsylvania.....	47.5

NON-COMMERCIAL FM BROADCAST STATION IN OPERATION ON OLD BAND

KALW.....	San Francisco, California.....	44.5
WBEZ.....	Chicago, Illinois.....	44.5
WBKY.....	Lexington, Kentucky.....	44.5
WBOE.....	Cleveland, Ohio.....	44.5

Note B.—Future assignments to be limited to fixed circuits which, as a result of an engineering study, may be expected to operate in this band on a non-interference basis to the television service.

Note C.—Aeronautical Marker Beacons are centered on 75.0 Mc with a guard band 74.6 to 75.4 Mc from which other services are excluded:

39 F.C.C.