



# member service

**NATIONAL ASSOCIATION OF RADIO AND TELEVISION BROADCASTERS**

---

## ENGINEERING DEPARTMENT

On May 19, 1955, the FCC revised certain sections of its Rules and Standards of Good Engineering Practice Concerning Standard Broadcast Stations. In this proceeding (Docket 11020), Subsections B and C of Section 2 and Sections 3, 7, 8, 9, 10, 14, 17, 20, 21, 22 and 23 were deleted. Many of the provisions contained in these Sections were shifted into the Rules; others were deleted in their entirety because they were no longer appropriate.

The attached copy of the Standards of Good Engineering Practice Concerning Standard Broadcast Stations is the amended version which became effective June 30. For your convenience, we have made notations following the titles of the deleted portions to reference the current section of the Rules now applicable. Please note that these underlined notations are not a part of the Standards, but are intended only to be used as references.

We have also appended two "Public Notices" of the Commission. Although neither of these has been incorporated into either the Rules or the Standards, they are given here for your information.



THE HISTORY OF THE RADIO

BY

THE HISTORY OF THE RADIO

BY

THE HISTORY OF THE RADIO

BY

THE HISTORY OF THE RADIO

BY

THE HISTORY OF THE RADIO

BY

THE HISTORY OF THE RADIO

BY

THE HISTORY OF THE RADIO

BY

THE HISTORY OF THE RADIO

BY

THE HISTORY OF THE RADIO

BY

THE HISTORY OF THE RADIO

BY

THE HISTORY OF THE RADIO

BY

THE HISTORY OF THE RADIO

BY

THE HISTORY OF THE RADIO

BY

THE HISTORY OF THE RADIO

BY

THE HISTORY OF THE RADIO

BY



# member service

**NATIONAL ASSOCIATION OF RADIO AND TELEVISION BROADCASTERS**

---

**ENGINEERING DEPARTMENT**

**A. Prose Walker, Manager**

## **FREQUENCIES USED BY THE BROADCAST SERVICES**

### **CONTENTS**

Standard Broadcast (AM) Stations .....	2
FM Stations .....	6
Television Stations .....	8
Frequency Selection .....	9
<b>Auxiliary Broadcast Services:</b>	
Introduction .....	10
Remote Pickup Broadcast Stations .....	11
AM/FM Studio-Transmitter Link Stations .....	13
Radio Order Circuits for AM/FM STLs .....	14
FM Inter-city Relay Stations .....	14
Television Pickup Stations .....	14
Television Studio-Transmitter Link Stations .....	14
Television Inter-city Relay Stations .....	15
<b>Frequencies for Television Auxiliary Services:</b>	
Visual and Aural Transmissions .....	15
Sound Channels only .....	16
Radio Order Circuits for TV STLs .....	16
<b>Other Frequencies of Interest to Broadcasters:</b>	
Motion Picture Radio Service .....	17
Citizens Radio Service .....	18
Summary of Frequencies Used by the Broadcast Services .....	19

**JULY, 1955**

# STANDARD BROADCAST (AM) STATIONS

## Classes and Power of Standard Broadcast Stations

**Class I Station:** A Class I station is a dominant station operating on a clear channel and designed to render primary and secondary service over an extended area and at relatively long distances. Its primary service area is free from objectionable interference from other stations on the same and adjacent channels and its secondary service area free from interference, except from stations on the adjacent channel, and from stations on the same channel in accordance with the channel designation in Section 3.25 or in accordance with the Engineering Standards of Allocation. The operating power shall be not less than 10 kilowatts nor more than 50 kilowatts.

**Class II Station:** A Class II station is a secondary station which operates on a clear channel and is designed to render service over a primary service area which is limited by and subject to such interference as may be received from Class I stations. A station of this class shall operate with power not less than 0.25 kilowatt nor more than 50 kilowatts. Whenever necessary, a Class II station shall use a directional antenna or other means to avoid interference with Class I stations and with other Class II stations, in accordance with the Engineering Standards of Allocation.

**Class III Station:** A Class III station is a station which operates on a regional channel and is designed to render service primarily to a metropolitan district, and the rural area contiguous thereto. Class III stations are subdivided into two classes:

1. **Class III-A Station:** A Class III-A station is a Class III station which operates with power not less than 1 kilowatt nor more than 5 kilowatts and the service area of which is subject to interference in accordance with the Engineering Standards of Allocation.
2. **Class III-B Station:** A Class III-B station is a Class III station which operates with a power not less than 0.5 kilowatt, and not more than 1 kilowatt night and 5 kilowatts daytime, and the service area of which is subject to interference in accordance with the Engineering Standards of Allocation.

**Class IV Station:** A Class IV station is a station operating on a local channel and designed to render service primarily to a city or town and the suburban and rural areas contiguous thereto. The power of a station of this class shall not be less than 0.1 kilowatt or more than 0.25 kilowatt, and its service area is subject to interference in accordance with the Engineering Standards of Allocation.

(FCC Rules, Section 3.22)

### "10% Rule"

Except for certain circumstances, FCC requires Class II, III and IV stations to serve at least 90%

of the population within their normally protected contours. For a more detailed explanation of the exceptions, see FCC Rules, Section 3.28 (c).

## Time of Operation of Standard Broadcast Stations

Standard broadcast stations may be licensed to operate in accordance with the following:

(a) *Unlimited time* permits operation without a maximum limit as to time.

(b) *Limited time* is applicable to Class II (secondary stations) operating on a clear channel only. It permits operation of the secondary station during daytime, and until local sunset if located west of the dominant station on the channel, or if located east thereof, until sunset at the dominant station, and in addition during night hours, if any, not used by the dominant station or stations on the channel.

By Proposed Report and Order in Docket 8333 issued March 12, 1954, this definition would be amended to read:

"*Limited time* is applicable to Class II (secondary stations) on a clear channel upon which the priority of Class I use is assigned exclusively to the United States. It permits operation of the secondary station from local sunrise to local sunset and in addition during night hours, if any, not used by the dominant station or stations on the channel."

(c) *Daytime* permits operation during the hours between average monthly local sunrise and average monthly local sunset. Daytime stations operating on local channels may, upon notification to the Commission and the Engineer in Charge of the radio district in which they are located, operate at hours beyond those specified in their license. See also footnotes 6 and 11 following.

(d) *Sharing time* permits operation during hours which are so restricted by the station license as to require a division of time with one or more other stations using the same channel.

(e) *Specified hours* means that the exact operating hours are specified in the license. Specified hours stations operating on local channels except those sharing time with other stations may, upon notification to the Commission and the Engineer in Charge of the radio district in which they are located, operate at hours beyond those specified in their license.

(FCC Rules, Section 3.23)

## Minimum Operating Schedule

Except Sundays, the licensee of each standard broadcast station shall maintain a minimum operating schedule of two-thirds of the total hours

that it is authorized to operate between 6 AM and 6 PM, local standard time, and two-thirds of the total hours it is authorized to operate between 6 PM and midnight, local standard time, except that in an emergency when, due to causes beyond the control of the licensee, it becomes impossible to continue operating, the station may cease operation for a period of not to exceed 10 days, provided that the Commission and the Engineer in Charge shall be notified in writing immediately after the emergency develops.  
(FCC Rules, Section 3.71)

### Frequencies Used for Standard Broadcast Stations

The band 535-1605 Kc is used for standard broadcasting. It is divided into 107 channels of 10 Kc each. Following is a list of standard broadcast channels and the conditions under which each may be used in the United States. For further reference and additional information, see FCC Rules, Part 3, Subpart A, The Standards of Good Engineering Practice Concerning Standard Broadcast Stations, and the 1950 North American Regional Broadcasting Agreement.

Channel	Classification	NARBA Class I Priority	Use Under FCC Rules	See Footnotes
540	Clear	Canada (I-A)	II	(1) (2) (3)
550	Regional	Cuba (I-C)	III-A, III-B	(4) (5) (6)
560	Regional		III-A, III-B	(4) (6)
570	Regional	Cuba (I-D)	III-A, III-B	(4) (6) (7)
580	Regional		III-A, III-B	(4) (6)
590	Regional	Cuba (I-D)	III-A, III-B	(4) (6) (7)
600	Regional		III-A, III-B	(4) (6)
610	Regional		III-A, III-B	(4) (6)
620	Regional	Dominican Republic (I-C)	III-A, III-B	(4) (5) (6)
630	Regional	Cuba (I-D)	III-A, III-B	(4) (6) (7)
640	Clear	USA (I-A) Canada (I-B) Cuba (I-C)	I, II	(5) (8) (9) (10) (11) (12) (19)
650	Clear	USA (I-A)	I, II	(8) (9) (10) (11) (19)
660	Clear	USA (I-A)	I, II	(8) (9) (10) (11) (19)
670	Clear	USA (I-A)	I, II	(8) (9) (10) (11) (19)
680	Clear	USA (I-B)	I, II	(10a) (11) (13) (19)
690	Clear	Canada (I-A) Cuba (I-C)	II	(1) (3) (5)
700	Clear	USA (I-A)	I, II	(8) (9) (10) (11) (19)
710	Clear	USA (I-B)	I, II	(10a) (11) (13) (19)
720	Clear	USA (I-A)	I, II	(8) (9) (10) (11) (19)
730	Clear	Mexico (I-A)	II	(14)
740	Clear	Canada (I-A) Cuba (I-D)	II	(1) (3) (7)
750	Clear	USA (I-A)	I, II	(8) (9) (10) (11) (19)
760	Clear	USA (I-A)	I, II	(8) (9) (10) (11) (19)
770	Clear	USA (I-A)	I, II	(8) (9) (11) (20)
780	Clear	USA (I-A)	I, II	(8) (9) (10) (11) (19)
790	Regional		III-A, III-B	(4) (6)
800	Clear	Mexico (I-A)	II	(14)
810	Clear	USA (I-B)	I, II	(10a) (11) (13) (19)
820	Clear	USA (I-A)	I, II	(8) (9) (10) (11) (19)
830	Clear	USA (I-A)	I, II	(8) (9) (10) (11) (19)
840	Clear	USA (I-A)	I, II	(8) (9) (10) (11) (19)
850	Clear	USA (I-B)	I, II	(10a) (11) (13) (19)
860	Clear	Canada (I-A) Cuba (I-C)	II	(1) (3) (5)
870	Clear	USA (I-A)	I, II	(8) (9) (10) (11) (19)
880	Clear	USA (I-A)	I, II	(8) (9) (10) (11) (19)
890	Clear	USA (I-A)	I, II	(8) (9) (10) (11) (19)
900	Clear	Mexico (I-A)	II	(14)
910	Regional		III-A, III-B	(4) (6)
920	Regional	Cuba (I-D)	III-A, III-B	(4) (6) (7)
930	Regional		III-A, III-B	(4) (6)
940	Clear	Canada & Mexico (I-B)	I, II	(10a) (11) (13) (19)
950	Regional	Cuba (I-D)	III-A, III-B	(4) (6) (7)
960	Regional		III-A, III-B	(4) (6)
970	Regional		III-A, III-B	(4) (6)
980	Regional	Cuba (I-D)	III-A, III-B	(4) (6) (7)
990	Clear	Canada (I-A)	II	(1) (3)
1000	Clear	Mexico & USA (I-B)	I, II	(10a) (11) (13) (19)
1010	Clear	Canada (I-A) Cuba (I-B)	II	(1) (3) (15)

<i>Channel</i>	<i>Classification</i>	<i>NARBA Class I Priority</i>	<i>Use Under FCC Rules</i>	<i>See Footnotes</i>
1020	Clear	USA (I-A)	I, II	(8) (9) (10) (11) (19)
1030	Clear	USA (I-A)	I, II	(11) (13) (16) (20)
1040	Clear	USA (I-A)	I, II	(8) (9) (10) (11) (19)
1050	Clear	Mexico (I-A)	II	(14) (17)
1060	Clear	Mexico & USA (I-B)	I, II	(10a) (11) (13) (19)
1070	Clear	Canada & USA (I-B)	I, II	(10a) (11) (13) (19)
1080	Clear	USA (I-B)	I, II	(10a) (11) (13) (19)
1090	Clear	Mexico & USA (I-B)	I, II	(10a) (11) (13) (19)
1100	Clear	USA (I-A)	I, II	(8) (9) (10) (11) (19)
1110	Clear	USA (I-B)	I, II	(10a) (11) (13) (19)
1120	Clear	USA (I-A)	I, II	(8) (9) (10) (11) (19)
1130	Clear	Canada & USA (I-B)	I, II	(10a) (11) (13) (19)
1140	Clear	Mexico & USA (I-B)	I, II	(10a) (11) (13) (19)
1150	Regional		III-A, III-B	(4) (6)
1160	Clear	USA (I-A)	I, II	(8) (9) (10) (11) (19)
1170	Clear	USA (I-B)	I, II	(10a) (11) (13) (19)
1180	Clear	USA (I-A)	I, II	(8) (9) (10) (11) (19)
1190	Clear	Mexico & USA (I-B)	I, II	(10a) (11) (13) (19)
1200	Clear	USA (I-A)	I, II	(8) (9) (10) (11) (19)
1210	Clear	USA (I-A)	I, II	(8) (9) (10) (11) (19)
1220	Clear	Mexico (I-A)	II	(14) (18)
1230	Local		IV	
1240	Local		IV	(12)
1250	Regional		III-A, III-B	(4) (6)
1260	Regional		III-A, III-B	(4) (6)
1270	Regional		III-A, III-B	(4) (6)
1280	Regional		III-A, III-B	(4) (6)
1290	Regional		III-A, III-B	(4) (6)
1300	Regional		III-A, III-B	(4) (6)
1310	Regional		III-A, III-B	(4) (6)
1320	Regional		III-A, III-B	(4) (6)
1330	Regional		III-A, III-B	(4) (6)
1340	Local		IV	
1350	Regional		III-A, III-B	(4) (6)
1360	Regional		III-A, III-B	(4) (6)
1370	Regional		III-A, III-B	(4) (6)
1380	Regional		III-A, III-B	(4) (6)
1390	Regional		III-A, III-B	(4) (6)
1400	Local		IV	
1410	Regional		III-A, III-B	(4) (6)
1420	Regional		III-A, III-B	(4) (6)
1430	Regional		III-A, III-B	(4) (6)
1440	Regional		III-A, III-B	(4) (6)
1450	Local		IV	
1460	Regional		III-A, III-B	(4) (6)
1470	Regional		III-A, III-B	(4) (6)
1480	Regional		III-A, III-B	(4) (6)
1490	Local		IV	
1500	Clear	USA (I-B)	I, II	(10a) (11) (13) (19)
1510	Clear	USA (I-B)	I, II	(10a) (11) (13) (19)
1520	Clear	USA (I-B)	I, II	(10a) (11) (13) (19)
1530	Clear	USA (I-B)	I, II	(10a) (11) (13) (19)
1540	Clear	Bahamas (I-A) USA (I-B)	II	(10a) (13) (19)
1550	Clear	Canada & Mexico (I-B)	I, II	(10a) (11) (13) (19)
1560	Clear	USA & Cuba (I-B)	I, II	(10a) (11) (13) (19)
1570	Clear	Mexico (I-A)	II	(14)
1580	Clear	Canada (I-A)	II	(1) (3)
1590	Regional		III-A, III-B	(4) (6)
1600	Regional		III-A, III-B	(4) (6)

### Footnotes to Standard Broadcast Section

- (1) For Class II stations which will not deliver over 5 microvolts per meter groundwave or 25 microvolts per meter 10% time skywave at any point on the Canadian border and provided that such stations operating night-time (i.e., sunset to sunrise at the location of the Class II station) are located not less than 650 miles from the nearest Canadian border.
  - (2) Subject to the condition that no harmful interference be caused to services operating on 500 Kc and in the band 510-535 Kc.
  - (3) Proposed rule-making in Docket 10453 provides for certain assignments on this channel to be submitted to the Canadian government for comments, taking into account daytime skywave. No applications are being granted at this time which are not in conformity with the proposals contained in Docket 10453.
  - (4) Class IV stations presently operating on this channel are allowed to continue operation, but are not protected against interference from Class III stations. No new Class IV stations will be assigned to the channel.
  - (5) New assignments may not deliver over 25 microvolts per meter 10% time skywave at any point on the border of the country having priority for a Class I-C station on this channel. For definition of this class of station and requirements for daytime protection, see 1950 North American Regional Broadcasting Agreement.
  - (6) Class III-A and Class III-B stations on this channel may begin operations at 4:00 AM with their authorized daytime facilities. The FCC may order such operations to cease, however, if undue interference is caused to other stations on the same channel. (See FCC Rules, Section 3.87)
  - (7) New assignments may not deliver over 50 microvolts per meter 10% time skywave at any point on the border of the country having priority for a Class I-D station on this channel. For definition of this class of station and requirements for daytime protection, see 1950 North American Regional Broadcasting Agreement.
  - (8) One Class I and one or more Class II stations may be assigned on this channel. Class II stations are restricted to limited time or daytime only operation in the continental limits of the U.S., but proposed rule-making (Docket 10765) provides for unlimited time Class II stations in Alaska, Hawaii, Virgin Islands and Puerto Rico.
  - (9) Power shall not be less than 50 Kw for Class I stations on this channel.
  - (10) By Proposed Report and Order in Docket 8333 issued March 12, 1954, pending conclusion of proceedings in Docket 6741, FCC would withhold action on this channel for:
    1. Applications proposing new daytime or limited time assignments.
    2. Applications from existing stations proposing a change in frequency to operate either daytime only or limited time on this channel.
    3. Applications from existing daytime or limited time stations on this channel to effect major improvements of facilities such as an increase in power or a substantial change of the radiation pattern.
- (10a) Provisions 1 and 2 of Footnote 10 apply to this channel.
  - (11) Class II stations on this channel may begin operations at 4:00 AM with their authorized daytime facilities provided no interference is caused within the 0.5 millivolt per meter 50% skywave of the Class I station(s) except
    1. Where the Class I station is located east of the Class II station, in which case the Class II station may begin operations at local sunrise time of the Class I station; or
    2. Where agreement has been reached with the Class I station to begin operations prior to local sunrise.Note: FCC may order such operations to cease, however, if undue interference is caused to other stations on the same channel. (See FCC Rules, Section 3.87).
  - (12) This is one of the two channels used for CONELRAD transmissions.
  - (13) One or more Class I stations may be assigned to this channel. Class II applications are subject to the same provisions as stated in Footnote 10.
  - (14) In continental U.S., for Class II stations which operate daytime only with power not in excess of 1 Kw and which will not deliver over 5 microvolts per meter groundwave at any point on the Mexican border, and in Alaska, Hawaii, Puerto Rico, and the Virgin Islands, for Class II stations which will not deliver over 5 microvolts per meter groundwave or 25 microvolts per meter 10% time skywave at any point on said border.
  - (15) A station on 1010 Kc shall also protect a Class I-B station at Havana, Cuba.
  - (16) Under terms of the 1950 North American Regional Broadcasting Agreement, Class I-A priority on this channel is assigned to USA, however FCC Rules continue to classify 1030 Kc as Class I-B, pending ratification of the 1950 Agreement.
  - (17) The U.S. is permitted under the "Gentlemen's Agreement" to continue operation of one 50 Kw full-time Class II station with directional pattern that will direct the signal to the northeast and protect the Mexican station's signal in the U.S. as much as possible.

- (18) The U.S. is permitted under the "Gentlemen's Agreement" to assign a station in the Detroit, Michigan, area with a directional antenna that will direct the signal to the northward and protect the Mexican station's coverage in the U.S. as much as possible.
- (19) By Proposed Report and Order in Docket 8333 issued March 12, 1954, FCC would assign new Class II daytime or limited time stations on this channel only where the new station would have a different mode of operation during the transitional period (two hours after sunrise and two hours before sunset) from its so-called daytime operation. New Class II unlimited time stations would have three different modes of operation: daytime, nighttime, and transitional time. Criteria for the three modes of operation will be set forth in an amendment

to the Standards of Good Engineering Practice Concerning Standard Broadcast Stations if the above Report and Order is adopted. Transitional period operation involves determination of radiated field at pertinent distance and azimuth from dominant station based on FCC proposed curves and interpolation chart from the record of Docket 8333. Existing Class II stations on this channel will not be required at this time to conform to these criteria, however, both Class I-B and Class II stations now in operation could be required to so conform pending settlement of Docket 6741.

- (20) No applications will be processed on this channel until a decision is reached in Docket 6741. See FCC Public Notice #96934 issued August 9, 1946.

## FM STATIONS

### Classes and Power of FM Stations

*Class A Station:* A Class A station is a station which operates on a Class A channel and is designed to render service primarily to a community or to a city or town other than the principal city of an area, and the surrounding rural area. The coverage of a Class A station shall be not more than the equivalent of 1 kilowatt effective radiated power and antenna height of 250 feet above average terrain, as determined by the methods prescribed in the Standards of Good Engineering Practice Concerning FM Broadcast Stations. A Class A station will not be licensed with more than 1 kilowatt effective radiated power. The power rating of the transmitter used for a Class A station shall be not less than 250 watts nor more than 1 kilowatt. The signal intensity requirements of Section 2 of the Standards of Good Engineering Practice Concerning FM Broadcast Stations shall determine the minimum coverage of a Class A station. Class A stations will normally be protected to the 1 mv/m contour; however, assignments will be made in a manner to insure, in so far as possible, a maximum of service to all listeners, whether urban or rural, giving consideration to the minimum signal capable of providing service. (FCC Rules, Section 3.203)

*Class B Station:* The coverage of a Class B station in Area II\* shall normally be not more than the equivalent of 20 kilowatts effective radiated power and antenna height of 500 feet above average terrain. The use of greater power and antenna height will be encouraged in those portions of Area II where such use would not result in undue interference to stations already authorized or to probable assignments in so far as can be determined at the time of the grant. In such case, the power, antenna height, and area will be deter-

\* See Footnote 1, page 7.

mined on the merits of each application with particular attention being given to rural areas which would not otherwise receive service. (FCC Rules, Section 3.204)

### Time of Operation

All FM broadcast stations are licensed for unlimited time operation. A minimum of 36 hours per week during the hours of 6 AM to midnight, consisting of not less than five hours in any one day, must be devoted to FM broadcast operation. Time devoted to operations conducted under a Subsidiary Communications Authorization is not included in meeting this requirement. In an emergency when, due to causes beyond the control of a licensee, it becomes impossible to continue operation, the station may cease operation for a period not to exceed 10 days, provided the Commission and the Engineer in Charge of the radio district in which the station is located shall be notified in writing immediately after the emergency develops. (FCC Rules, Section 3.261)

### Subsidiary Communications Authorizations (SCA)

FM broadcast stations may engage in "functional (background) music" operations in addition to their regular FM broadcast service. Such operations may be conducted on a "simplex" basis during the time not devoted to the required number of FM broadcasting hours (see above) until July 2, 1956. (See paragraph 15 of the Report and Order issued March 22, 1955, in Docket 10832.) "Multiplex" operations may be conducted at any time. Either method may be used to provide storecasting, transitcasting, etc., services. The SCA will run concurrently with the FM broadcast license, and may not be renewed unless the FM broadcast license is also renewed. (For



further details, see FCC Rules, Section 3.293, 3.294, 3.295 and 3.296, and the Standards of Good Engineering Practice Concerning FM Broadcast Stations, Section 8.)

### Frequencies Used for FM Broadcast Stations

The band 88-108 Mc is reserved for the FM Broadcast Service. These are 100 channels of 200 Kc each (80 for commercial broadcasting and 20 for educational broadcasting). Educational channels are in the 88-92 Mc portion of the FM band, and commercial broadcasting is allotted the remainder, 92-108 Mc.

For further reference, see FCC Rules, Part 3, Subpart B, and the Standards of Good Engineering Practice Concerning FM Broadcast Stations.

Channel No.	Frequency	For Class
221	92.1 Mc	A
222	92.3 Mc	B
223	92.5 Mc	B
224	92.7 Mc	A
225	92.9 Mc	B
226	93.1 Mc	B
227	93.3 Mc	B
228	93.5 Mc	A
229	93.7 Mc	B
230	93.9 Mc	B
231	94.1 Mc	B
232	94.3 Mc	A
233	94.5 Mc	B
234	94.7 Mc	B
235	94.9 Mc	B
236	95.1 Mc	B
237	95.3 Mc	A
238	95.5 Mc	B
239	95.7 Mc	B
240	95.9 Mc	A
241	96.1 Mc	B
242	96.3 Mc	B
243	96.5 Mc	B
244	96.7 Mc	A
245	96.9 Mc	B
246	97.1 Mc	B
247	97.3 Mc	B
248	97.5 Mc	B
249	97.7 Mc	A
250	97.9 Mc	B
251*	98.1 Mc	B
252*	98.3 Mc	A
253*	98.5 Mc	B
254*	98.7 Mc	B
255*	98.9 Mc	B
256*	99.1 Mc	B
257*	99.3 Mc	A
258*	99.5 Mc	B
259*	99.7 Mc	B
260*	99.9 Mc	B

\* See Footnote 2.

Channel No.	Frequency	For Class
261*	100.1 Mc	A
262*	100.3 Mc	B
263*	100.5 Mc	B
264*	100.7 Mc	B
265*	100.9 Mc	A
266*	101.1 Mc	B
267*	101.3 Mc	B
268*	101.5 Mc	B
269*	101.7 Mc	A
270*	101.9 Mc	B
271*	102.1 Mc	B
272*	102.3 Mc	A
273*	102.5 Mc	B
274*	102.7 Mc	B
275*	102.9 Mc	B
276*	103.1 Mc	A
277*	103.3 Mc	B
278*	103.5 Mc	B
279*	103.7 Mc	B
280*	103.9 Mc	A
281*	104.1 Mc	B
282*	104.3 Mc	B
283*	104.5 Mc	B
284*	104.7 Mc	B
285*	104.9 Mc	A
286*	105.1 Mc	B
287*	105.3 Mc	B
288*	105.5 Mc	A
289*	105.7 Mc	B
290*	105.9 Mc	B
291*	106.1 Mc	B
292*	106.3 Mc	A
293*	106.5 Mc	B
294*	106.7 Mc	B
295*	106.9 Mc	B
296*	107.1 Mc	A
297*	107.3 Mc	B
298*	107.5 Mc	B
299*	107.7 Mc	B
300*	107.9 Mc	B

### Footnotes to FM Broadcast Section

(1) Area I includes southern New Hampshire; all of Massachusetts, Rhode Island, and Connecticut; southeastern New York as far north as Albany-Troy-Schenectady; all of New Jersey, Delaware; and the District of Columbia; Maryland as far west as Hagerstown; and eastern Pennsylvania as far west as Harrisburg.

Area II comprehends the remainder of the United States not included in Area I.

(2) In the Territory of Hawaii, the band 98-108 Mc is allocated for non-broadcast use, and the frequencies 98.1-107.9 Mc will not be assigned in Hawaii for use by FM broadcast stations.

# TELEVISION STATIONS

## Minimum and Maximum Visual Effective Radiated Power (ERP)

### Minimum

Effective August 1, 1955, minimum power requirements for all television stations, regardless of the size of the city, will be reduced to -10 dbk (100 W) with no minimum antenna height specified.

(A pending rule-making proposal in Docket 11331 would permit the operation of co-channel amplifying transmitters in conjunction with the main transmitters. This proposal only applies to UHF stations where such operation is needed to fill in "shadow areas.")

### Maximum

Channel Nos.	Maximum Visual ERP
2- 6	20 dbk (100 Kw)
7-13	25 dbk (316 Kw)
14-83	30 dbk (1000 Kw)

(A pending rule-making proposal in Docket 11433 would increase the maximum ERP for channels 14-83 to 37 dbk [5000 Kw].)

See FCC Rules, Section 3.614.

### Time of Operation

All television broadcast stations are licensed for unlimited time operation. Each station must maintain a regular program operating schedule as follows:

*First 18 months of operation:* Not less than 2 hours daily in any five broadcast days per week, and not less than a total of 12 hours per week.

*Each successive 6-month period:* Not less than 2 hours daily in any five broadcast days per week, and not less than a total of 16 hours, 20 hours, and 24 hours per week respectively.

*Third year of operation and thereafter:* Not less than 2 hours in each of the seven days of the week, and not less than a total of 28 hours per week.

See FCC Rules, Section 3.651.

### Frequencies Used for Television Stations

There are 82 channels in the Television Broadcast Service, 12 for VHF television and 70 for UHF television. Each channel has a bandwidth of 6 Mc.

Assignment of a channel to an applicant is made in accordance with the Table of Assignments given in FCC Rules, Section 3.606(b).

For further reference, see FCC Rules, Part 3, Subpart E.

The channel numbers and frequency bands for television stations are as follows:

Channel No.	Frequency Band	Channel No.	Frequency Band
2	54-60 Mc	41	632-638 Mc
3	60-66 Mc	42	638-644 Mc
4	66-72 Mc	43	644-650 Mc
		44	650-656 Mc
		45	656-662 Mc
		46	662-668 Mc
		47	668-674 Mc
5	76-82 Mc	48	674-680 Mc
6	82-88 Mc	49	680-686 Mc
7	174-180 Mc	50	686-692 Mc
8	180-186 Mc	51	692-698 Mc
9	186-192 Mc	52	698-704 Mc
10	192-198 Mc	53	704-710 Mc
11	198-204 Mc	54	710-716 Mc
12	204-210 Mc	55	716-722 Mc
13	210-216 Mc	56	722-728 Mc
14	470-476 Mc	57	728-734 Mc
15	476-482 Mc	58	734-740 Mc
16	482-488 Mc	59	740-746 Mc
17	488-494 Mc	60	746-752 Mc
18	494-500 Mc	61	752-758 Mc
19	500-506 Mc	62	758-764 Mc
20	506-512 Mc	63	764-770 Mc
21	512-518 Mc	64	770-776 Mc
22	518-524 Mc	65	776-782 Mc
23	524-530 Mc	66	782-788 Mc
24	530-536 Mc	67	788-794 Mc
25	536-542 Mc	68	794-800 Mc
26	542-548 Mc	69	800-806 Mc
27	548-554 Mc	70	806-812 Mc
28	554-560 Mc	71	812-818 Mc
29	560-566 Mc	72	818-824 Mc
30	566-572 Mc	73	824-830 Mc
31	572-578 Mc	74	830-836 Mc
32	578-584 Mc	75	836-842 Mc
33	584-590 Mc	76	842-848 Mc
34	590-596 Mc	77	848-854 Mc
35	596-602 Mc	78	854-860 Mc
36	602-608 Mc	79	860-866 Mc
37	608-614 Mc	80	866-872 Mc
38	614-620 Mc	81	872-878 Mc
39	620-626 Mc	82	878-884 Mc
40	626-632 Mc	83	884-890 Mc

Note: 72-76 Mc is used for assignment of Fixed Radio (non-broadcast) stations on the condition that no harmful interference be caused to TV channels 4 and 5.

# FREQUENCY SELECTION

<i>Service</i>	<i>Choice</i>	<i>Service</i>	<i>Choice</i>
Standard Broadcasting (AM)	Applicant must specify frequency. Search must be made for an available frequency by the applicant, or his consultant.	Television Broadcasting—Con.	Petition for rule-making to change the Table of Assignments (3.606b) may be filed, and if granted, then application may be filed for new channel so added.
FM Broadcasting	FCC designates a frequency from list of available channels of the particular class in the area. Applicant specifies class of station desired.		Petitions to change 3.606 (b) should be considered in the light of the following:
Television Broadcasting	Applicant may select any unassigned channel from Section 3.606 (b). Applications will not be accepted by FCC if they are not in accord with 3.606 (b).		Sec. 3.607—Availability of channels.
			Sec. 3.608—International agreements.
			Sec. 3.610—Separations.

# AUXILIARY BROADCAST SERVICES

## Introduction

FCC Rules provide for the use of radio transmitting apparatus to supply certain auxiliary services in connection with broadcasting. These services fall into four general categories:

1. *Portable or mobile stations* which may be used to relay programs from places of origination other than a studio.
2. *Base stations*, usually located at the studio or transmitter of a broadcast station, and used to co-ordinate the activities of portable or mobile stations.
3. *Fixed stations (STL)* which may be used to provide a program circuit between the main or auxiliary studios to the transmitter of a broadcast station.
4. *Fixed stations (Inter-city Relay)* which may be used to relay programs from one broadcast station to other broadcast stations for network programming.

Category (1) includes two classes of stations, i.e., *Remote Pickup Broadcast Mobile Stations* which may be used for relaying aural broadcast program material or the aural portion of television programs and are available to AM, FM, and TV broadcast station licensees; and *Television Pickup Stations* which may be used for relaying television program material, either visual alone or the combined visual and aural program material by means of multiplexing. Television pickup stations are available only to television broadcast stations.

Category (2) contains a class of station called a *Remote Pickup Broadcast Base Station*. From the standpoint of equipment, frequency assignments, technical operation, and availability, they are identical with Remote Pickup Broadcast Mobile Stations. A differentiation is made because they are permanently installed at a fixed location and do not normally carry program material. The primary purpose of such base stations is to provide communication with remote mobile stations or television pickup stations, however, other uses are permitted under special circumstances.

Category (3) includes three classes of stations, *Standard Broadcast STL Stations*, *FM Broadcast STL Stations*, and *Television STL Stations*. STLs (studio-transmitter links) are used to provide a program circuit between the studio and the transmitter of a broadcast station. They are available to AM, FM and TV broadcast stations. AM, FM, and TV STLs which are used to carry only the aural portion of TV programs, operate in the same general portion of the spectrum and the same type of transmitting equipment is used in all three services. Television STLs which are used to carry the visual portion of television programs operate in the so-called "microwave" portion of the spectrum. Some equipment is designed to simultaneously carry the aural portion of the

program material on the same carrier by means of multiplexing and such use is permitted if it can be accomplished without degrading the visual and aural signal to a point where the overall performance of the television system cannot meet the minimum requirements of the Rules Governing Television Broadcast Stations. Television broadcasters contemplating the use of multiplexing in their STL circuit should assure themselves that the equipment proposed to be used has sufficient performance capability to enable them to meet the requirements of Sec. 3.687.

Category (4) includes two classes of stations, *FM Broadcast Inter-city Relay Stations* and *TV Inter-city Relay Stations*. (There is no AM Inter-city Relay Service.) Inter-city relay stations are used for the interexchange of programs between broadcast stations for network operation. Circuits for the interexchange of broadcast programs are normally operated by communications common carriers, however, in the case of FM broadcasting, where high-quality aural circuits are required and in the case of television, where special video circuits as well as high-quality aural circuits are required, the telephone company serving a certain area may not be able to supply the desired service due to lack of adequate facilities. Under such circumstances, inter-city relay stations are available to FM and TV broadcasters on an interim basis pending the availability of adequate common carrier circuits. No provision is made for inter-city relay stations to be used in conjunction with AM broadcast stations since telephone circuits of suitable broadcast quality are generally available or can be made available on short notice. FM inter-city relay stations and TV inter-city relay stations which carry only the aural portion of the television program operate in the same general portion of the spectrum as AM, FM, and TV STL stations. TV inter-city relay stations used for the visual portion of television programs operate in the microwave bands used by TV pickup and TV STL stations. As in the case of TV STLs, the aural portion of the TV program may be transmitted on the same carrier as the visual program material by means of multiplexing. Quality standards for inter-city relay stations are left to the discretion of the individual broadcaster.

Some broadcasters prefer to keep equipment running on a 24-hour basis, feeling this is a factor in economical and trouble-free operation. Radiation of an unmodulated carrier is not authorized for the auxiliary broadcast services except during brief test periods, but equipment may be kept operating when no program material is being transmitted by shunting the output into a dummy antenna or a similar non-radiating load.

Remote pickup broadcast stations are asked to monitor for CONELRAD Radio Alerts and go off the air until the Radio All Clear. They may obtain

the Radio Alert by monitoring any standard, FM or TV station. Since the remote personnel would naturally be in communication with the mother station, and monitoring its transmissions in any case, no special receiver is required. The Voluntary CONELRAD Plan does not cover the TV auxiliary services or the AM and FM STLs since they operate above 890 Mc.

All of the material in this section is intended to

be an explanation of the FCC Rules relating to the operation of auxiliary broadcast stations. It should not be understood to replace the need for reference to the full text of Part 4 of the FCC Rules which covers the services. The material in this article is arranged according to classes of broadcasting stations which may use auxiliary stations, and reference is made throughout to the pertinent sections of Part 4 for further study.

## AM/FM SECTION

### Remote Pickup Broadcast Stations

See page 9, categories (1) and (2) for definitions. Broadcasters may use remote pickup broadcast stations at their discretion, and the choice between radio and wire lines does not depend on whether or not wire lines are available.

Remote pickup broadcast stations may be used for:

1. Transmission of AM, FM or the aural portion of TV program material originating outside a regular studio. (Normally, only Mobile stations are used.)
2. Orders and related communications directly concerning such transmissions, but *may not be used* to provide private mobile telephone systems to station personnel. (Both Base and Mobile stations may be so used.)
3. Emergency program or order circuits from studios in the event of failure of regular wire circuits, but *may not be used* for such purposes on a regular basis. (Both Base and Mobile stations may be so used.)
4. In Alaska, Hawaii, Puerto Rico and Virgin Islands for inter-city relays and STYs, provided such transmissions are not intended to be received directly by the public. Such use is not authorized in the continental limits of the U.S. (Both Base and Mobile stations may be so used.)
5. Under STA for mobile communications in connection with adjustment and maintenance of antenna system, or in connection with field intensity surveys. (Both Base and Mobile stations may be so used.)

6. Coordination of the activities of portable or mobile stations.
7. Two-way communication between the studio and transmitter of a broadcast station which has a radio STL. (Base stations only.)

Wire lines may be used to complete remote pickup circuits, if necessary.

Remote pickup broadcast stations will not be granted exclusive frequency assignments, and the same frequency or frequencies may be assigned to other licensees in the same area. (In the television section, it will be noted that some exclusive assignments of auxiliary frequencies are made for television purposes.)

Applicants may request information about the existing remote pickup assignments in a particular area, and apply for unassigned frequencies to the extent permitted by the FCC rules. The Commission is unable to supply information regarding existing assignments to the Industrial Radio Stations in the band shared by remote pickup stations with the service.

Where a frequency is shared by two or more remote pickup stations and simultaneous operation is contemplated, the transmission of actual program material has first priority, the transmission of cues and orders including preparatory communications has second priority, and the use of the remote pickup station for other authorized communication has the lowest priority. An exception to this rule is made for the frequencies 26.07 Mc, 26.09 Mc, 26.11 Mc, 26.13 Mc, 26.45 Mc and 26.47 Mc as noted below.

The following groups of frequencies are allocated for assignment to remote pickup broadcast stations. A licensee may have one or more frequencies assigned for operation in the same area, but is limited within each "division" to assignments from a single "group."

Division	Group	Frequencies	Type of Emission	Notes
1	A	1622 Kc 1606 Kc 1646 Kc	10-A-3	Not shared with other services.
2	D	25.87 Mc* 26.15 Mc 26.25 Mc 26.35 Mc		

<i>Division</i>	<i>Group</i>	<i>Frequencies</i>	<i>Type of Emission</i>	<i>Notes</i>
2	E	25.91 Mc*		
		26.17 Mc		
		26.27 Mc		
		26.37 Mc		
2	F	25.95 Mc*	20-A-3 or 20-F-3	Not shared with other services.
		26.19 Mc		
		26.29 Mc		
		26.39 Mc		
2	G	25.99 Mc*		
		26.21 Mc		
		26.31 Mc		
		26.41 Mc		
2	H	26.03 Mc*		
		26.23 Mc		
		26.33 Mc		
		26.43 Mc		
3	I	26.07 Mc*	20-A-3 or 20-F-3	Not shared with other services. When used for radio order circuits (see pages 14 and 16), such use is secondary to all other permissible uses.
		26.11 Mc		
		26.45 Mc		
3	J	26.09 Mc*		
		26.13 Mc		
		26.47 Mc		
4	K	152.87 Mc	30-A-3 or 60-F-3	Shared with Industrial Radio Services which have first priority on the frequencies. Docket 11253 proposes to assign Industrial stations on a reduced channel basis thus increasing the potential number of such stations having first priority. NARTB and others submitted comments to FCC requesting these nine channels be assigned exclusively to broadcast, utilizing a pass band and deviation of 7 Kc. with operation on a mutually protected basis with Industrial stations.
		152.93 Mc		
		152.99 Mc		
		153.05 Mc		
		153.11 Mc		
		153.17 Mc		
		153.23 Mc		
		153.29 Mc		
		153.35 Mc		
5	L	166.25 Mc	30-A-3 or 60-A-3	Use is subject to the condition that harmful interference will not be caused to present or future government stations in the band 162-174 Mc. Also, operation on these frequencies is not authorized in the TVA area, nor within 150 miles of New York City, nor outside the continental limits of the U.S.
5	M	170.15 Mc		
6	N	450.05 Mc	30-A-3 or 100-F-3	Not shared with other services.
		450.15 Mc		
		450.25 Mc		
		450.35 Mc		
		450.45 Mc		
		450.55 Mc		
		450.65 Mc		
		450.75 Mc		
		450.85 Mc		
		450.95 Mc		
		455.05 Mc		
455.15 Mc				

\* Use is subject to the condition that no harmful interference is caused to the reception of high frequency broadcast stations.

Division	Group	Frequencies	Type of Emission
		455.25 Mc	
		455.35 Mc	
		455.45 Mc	
		455.55 Mc	
		455.65 Mc	
		455.75 Mc	
		455.85 Mc	
		455.95 Mc	

*Notes*

The band 451-452 Mc presently shown in Part 4 of FCC Rules is to be changed to 455-456 Mc as shown here, and assignments are now being made by FCC in the 455-456 Mc Band.

**AM/FM Studio-Transmitter Link Stations**

STL stations are available to the licensees of both AM and FM broadcast stations and are used to relay programs from the studio to the transmitter of the station. Where the licensee of an AM station is also the licensee of an FM station, the same STL may be used for both stations. (See Section 4.532a.) The STL may also be used for the purpose of providing communication between studio and transmitter when no programs are being transmitted, or if multiplexing is employed, may be used for communication during program transmission.

Broadcasters may use radio STLs at their discretion, and the choice between radio STL and wire line (common carrier) STL does not depend on whether or not wire lines are available.

Any AM or FM station employing a radio STL may also use remote pickup base stations to provide an "order circuit" for communication of information concerning program service. Radio circuits may be used for this purpose *only* when the broadcast station uses a radio STL. See page 14.

Exclusive assignments will be made to STL stations providing the program circuit from the main studio to the transmitter of FM broadcast stations. In the case of AM STL stations, and FM STL stations at secondary studios, exclusive assignments will be made wherever practicable.

The following frequencies are available for broadcast STL stations:

*For FM STL stations only:*

Frequency	Type of Emission	Notes
940.5 Mc		
941.0 Mc		
941.5 Mc		
942.0 Mc		
942.5 Mc		Not shared with other services. May also be used for FM Inter-city Relay Stations. Licensed for unlimited time operation. Directional antenna is required.
943.0 Mc		
943.5 Mc		
944.0 Mc		
944.5 Mc		
945.0 Mc		
945.5 Mc	430-F-3	
946.0 Mc		See FCC Rules, Section 4.536.
946.5 Mc		
947.0 Mc		May be operated by remote control in accordance
947.5 Mc		

Frequency	Type of Emission	Notes
948.0 Mc		with the provisions of FCC Rules, Sec. 4.533.
948.5 Mc		
949.0 Mc		
949.5 Mc		
*950.0 Mc		
*950.5 Mc		
*951.0 Mc		
*951.5 Mc		

\* These four frequencies are subject to change. See FCC Docket 10797.

The following frequencies are used for AM STL stations. They are currently being shared with other services, but a proposal in FCC Docket 10797 would give the AM STL service exclusive assignments if it is adopted. Where there is insufficient space for FM STL stations in a particular area in the band 940-952 Mc (above), FM STL stations may also use the frequencies listed below:

Frequency	Type of Emission	Notes
925.5 Mc		May also be used for FM Inter-city Relay Stations. Licensed for unlimited time operation. Directional antenna is required. See FCC Rules, Section 4.536.
926.0 Mc		
926.5 Mc		
927.0 Mc		
927.5 Mc		
928.0 Mc		
928.5 Mc		
929.0 Mc		
929.5 Mc		
930.0 Mc		
930.5 Mc		May be operated by remote control in accordance with the provisions of FCC Rules, Sec. 4.533. Stations operating on these frequencies must accept any interference that may be experienced from the operation of Industrial, Scientific, and Medical equipment in the 890-940 Mc band.
931.0 Mc		
931.5 Mc		
932.0 Mc		
932.5 Mc	430-F-3	
933.0 Mc		
933.5 Mc		
934.0 Mc		
934.5 Mc		
935.0 Mc		
935.5 Mc		If Docket 10797 is adopted as proposed, the band 936-950 Mc would become available for exclusive use of AM, FM and TV (aural) STL stations, and the band 925-935 Mc would be deleted for broadcast use.
936.0 Mc		
936.5 Mc		
937.0 Mc		
937.5 Mc		
938.0 Mc		
938.5 Mc		
939.0 Mc		
939.5 Mc		

### Radio Order Circuits

Remote pickup base stations may be authorized to provide two-way communication between the studio and transmitter of a broadcast station which has a radio STL.

The following frequencies may be assigned for radio order circuits. They are licensed for unlimited time operation, but their use is secondary to other need for the same frequency(s).

Group	Frequency	Type of Emission
I	26.07 Mc*	20-A-3
	26.09 Mc*	
	26.11 Mc	20-F-3
	26.45 Mc	
J	26.13 Mc	20-A-3
	26.47 Mc	or 20-F-3

\* Use is subject to the condition that no harmful interference is caused to the reception of high frequency broadcast stations.

### FM Inter-city Relay Stations

The operation of FM inter-city relay stations is subject to the condition that no harmful interference is caused to other radio stations, present or future, operating in accordance with the Table of Frequency Allocations.

Wire lines may be used to complete circuits for FM inter-city relays. Inter-city relay stations

may be used for communication of program information when no programs are being transmitted, or if multiplexing is employed, may be used for communication during program transmission.

Relay stations will be authorized only when suitable common carrier facilities are not available. Each application for a new FM inter-city relay system, or for renewal of an existing system must be accompanied by verified statements showing:

1. Why the facilities are needed, including reasons why common carrier facilities are not available.
2. That the applicant has requested such facilities from the common carrier serving the area, and including copies of such request(s) and reply(s).

Frequencies available for FM inter-city relay stations are the same as those used for broadcast STLs (see listing on page 13).

As in the case of STLs, they are licensed for unlimited time operation, directional antennas are required, and they may be operated by remote control. The band 940-952 Mc is not shared with other services; the band 925-940 Mc is shared, but it is proposed in Docket 10797 to make the band 936-950 Mc available on an exclusive basis to AM, FM and TV (aural) STL stations, and delete the band 925-935 Mc for this purpose.

## TELEVISION SECTION

### Television Pickup Stations

Television pickup stations may be used for:

1. Transmission of program material originating outside a regular studio. These channels are primarily used for the transmission of the video portion of the pickup, but the aural portion may be multiplexed on the same channel. Applications must clearly state the nature of any multiplexing proposed.

If only the video portion is transmitted on the television pickup channel, the aural portion may be transmitted by wire line, or on one of the frequencies designated for remote pickup broadcast stations. Listed on pages 11, 12 and 13.

2. To provide temporary studio-transmitter links (without further authority of the FCC provided the installation of the antenna does not increase the height of any existing structure by more than 20 feet. Authority for increase of more than 20 feet may be obtained from FCC if necessary).
3. Orders and related communications concerning such transmissions. They *may not be used* solely for this purpose.

No standards are specified in either the FCC Rules or in any existing proposed rule-making concerning the quality of television pickups.

### Television STL Stations

The TV STL may be used for communications relating to program continuity during periods when no programs are being transmitted, or by multiplexing at any time.

The aural signal may be multiplexed on the STL, but broadcasters contemplating the use of multiplexing should assure themselves that the equipment proposed to be used has sufficient performance quality to enable them to meet the requirements of Section 3.687 of the FCC Rules.

The television broadcaster may elect to have a communications common carrier provide television pickup or television STL service, and in this case, the common carrier may use the same channels which would normally be assigned to the television station.

When the television station uses a television channel STL, it may also use remote pickup base stations to provide an "order circuit" for communication of information concerning program service. Radio circuits may be used for this pur-



pose *only* when a television channel STL is used. See page 16.

### Television Inter-city Relay Stations

Television inter-city relay stations provide a means on an interim basis whereby television broadcast licenses may provide their own inter-city television transmission services in connection with the operation of their television broadcast stations. At this time, the provision for the service is a temporary measure designed to assist the television industry until adequate common carrier facilities are available, and broadcasters who venture into the business of relaying television programs by means of television inter-city relay stations should plan to amortize their investments at the earliest possible date.

In September, 1954, the FCC proposed rule-making which would permit the granting of applications for private television inter-city relay stations even where common carrier facilities may be available. Among other comments received by the Commission was a counter-proposal by AT&T. The AT&T suggested that, if off-the-air pickup service was acceptable to the broadcasters and to the public, it could be provided by common carriers at charges "substantially less than the present charges for direct network connection." FCC issued a notice of further proposed rule-making, and is now considering the comments received on the counter-proposal. Until such time as the final decision is issued, broadcasters can only proceed on the basis of the present FCC Rules as set forth in Section 4.631 (c).

The use of channels for television inter-city relay stations is on a secondary basis, and is subject to the condition that no harmful interference is caused to stations operating in accordance with the Table of Frequency Allocations.

No standards are specified in either FCC Rules or in any existing proposed rule-making concerning the quality of television inter-city relay stations. Inter-city relay stations may be used for communication of program information either by multiplexing, or by simplex during periods of non-use for program transmission.

### Assignment of Channels for the Television Auxiliary Services

The television auxiliary frequencies are assigned interchangeably for television pickups, STLs, or inter-city relay stations.

Television stations may request the assignment of one channel in Band A or Band B, and one channel in Band D, or the following list of channels for use on an exclusive basis. In addition, they may request the assignment of additional channels which will be assigned, if available in the area, on a non-exclusive basis. The non-exclusive channels may be withdrawn any time they are needed to

provide exclusive channels for other television stations in the same area.

No exclusive assignments are made in Band C.\*

If two television stations in the same area are so located that they may share a single STL, they may by mutual agreement request the same assignment of the exclusive channel and, in addition, may be granted a second exclusive channel for each station from either Band A or Band B and a third exclusive channel from Band D.

Where only one exclusive channel is assigned, it is normally assigned to the main studio STL (where the television station employs a television channel STL); additional STLs may be operated at the broadcaster's discretion. Operation of the STL on a non-exclusive channel is subject to the condition that no harmful interference is caused to the operation of television pickup stations.

Any suitable type of emission may be used for the frequencies above 1500 Mc. Identification of the emission may be by whatever means the emission is authorized for, except that a visual-only transmitter may be identified by means of a keyed signal, either interrupting the carrier or by means of modulation impressed on the carrier, giving the call sign of the station.

Directional antennas are not required, but are usually employed at these frequencies.

BAND A	BAND B	BAND C**
1990-2008 Mc	6875-6900 Mc	10500-10525 Mc
2008-2025 Mc	6900-6925 Mc	10525-10550 Mc
2025-2042 Mc	6925-6950 Mc	10550-10575 Mc
2042-2059 Mc	6950-6975 Mc	10575-10600 Mc
2059-2076 Mc	6975-7000 Mc	10600-10625 Mc
2076-2093 Mc	7000-7025 Mc	10625-10650 Mc
2093-2110 Mc	7025-7050 Mc	10650-10675 Mc
2450-2467 Mc**	7050-7075 Mc***	10675-10700 Mc
2467-2484 Mc**	7075-7100 Mc***	
2484-2500 Mc**	7100-7125 Mc***	

\* Channels in Band A marked with (\*\*) and all channels in Band C are allocated to accommodate the incidental radiations of industrial, scientific, and medical equipment, and stations operating therein must accept any interference that may be caused by the operation of such equipment. These frequencies are also shared with other communications services and exclusive channel assignments will not be made, nor is the channeling shown in Bands A and C necessarily that which will be employed by such other services.

\*\* See above footnote.

\*\*\* Until further order by the Commission, these three channels will not be assigned to television broadcast stations in order that they may be used by communications common carriers to provide television pickup and STL services to television stations.

**BAND D**

12700-12725 Mc	12950-12975 Mc
12725-12750 Mc	12975-13000 Mc
12750-12775 Mc	13000-13025 Mc
12775-12800 Mc	13025-13050 Mc
12800-12825 Mc	13050-13075 Mc
12825-12850 Mc	13075-13100 Mc
12850-12875 Mc	13100-13125 Mc
12875-12900 Mc	13125-13150 Mc
12900-12925 Mc	13150-13175 Mc
12925-12950 Mc	13175-13200 Mc

899.5 Mc	905.5 Mc
900.0 Mc	906.0 Mc
900.5 Mc	906.5 Mc
901.0 Mc	907.0 Mc
901.5 Mc	907.5 Mc
902.0 Mc	908.0 Mc
902.5 Mc	908.5 Mc
903.0 Mc	909.0 Mc
903.5 Mc	909.5 Mc
904.0 Mc	910.0 Mc
904.5 Mc	910.5 Mc
905.0 Mc	

Additional frequencies for the transmission of the aural portion of a television pickup may be selected from the remote pickup broadcast frequencies shown on pages 11, 12 and 13 of this article.

The following additional frequencies may be assigned to TV STL or TV inter-city relay stations for transmission of the aural portion of the television broadcast. Type of emission employed is 430-F-3.

Stations operating on these frequencies must accept any interference that may be experienced from the operation of Industrial, Scientific and Medical equipment in the 890-940 Mc band. A proposal in FCC Docket 10797 would, if adopted, re-assign the band 890-950 Mc, allocating 890-935 Mc for exclusive use of common carriers, and 936-950 Mc for broadcast auxiliary stations exclusively.

(TV STL, TV Inter-city relays. Aural portion only.)

890.5 Mc	895.0 Mc
891.0 Mc	895.5 Mc
891.5 Mc	896.0 Mc
892.0 Mc	896.5 Mc
892.5 Mc	897.0 Mc
893.0 Mc	897.5 Mc
893.5 Mc	898.0 Mc
894.0 Mc	898.5 Mc
894.5 Mc	899.0 Mc

If Docket 10797 is adopted as proposed, the band 936-950 Mc would become available for exclusive use of AM, FM and TV (aural) STL stations, and the band 925-935 Mc would be deleted for broadcast use.

**Radio Order Circuits**

Remote pickup base stations may be authorized to provide two-way communication between the studio and transmitter of a television station which has a television channel STL.

The following frequencies may be assigned for radio order circuits. They are licensed for unlimited time operation, but their use is secondary to other need for the same frequency(s).

<i>Group</i>	<i>Frequency</i>	<i>Type of Emission</i>
	26.07 Mc*	
I	26.09 Mc*	20-A-3
	26.11 Mc	or
	26.45 Mc	20-F-3
J	26.13 Mc	20-A-3
	26.47 Mc	or
		20-F-3

\* Use is subject to the condition that no harmful interference is caused to the reception of high frequency broadcast stations.

# OTHER FREQUENCIES OF INTEREST TO BROADCASTERS

## Motion Picture Radio Service

Rules and regulations governing the Motion Picture Radio Service are found in Part 11, Subpart I. Part 11 covers all of the Industrial Radio Services and was set up to prescribe the manner in which frequencies may be made available for radio communication and control facilities to various industrial enterprises which, for safety purposes or other necessity, require radio transmitting facilities in order to function efficiently.

Of all the types of industrial enterprises covered in Part 11, only the Motion Picture Radio Service seems to be applicable to use by broadcasters, and this service may only be used by broadcasters while they are engaged in the production or filming of motion pictures (newsreels, documentaries, features, etc.). Since other services are both more practicable and more economical for general use as auxiliary broadcast stations, the Motion Picture Radio Service should be considered only by television stations which employ full-time motion picture crews, or by companies engaged in the business of making motion pictures for use either by theatres or television stations.

The frequencies allocated to this service cannot be used for video transmissions, but would provide a mobile telephone service, or a radio telephone circuit for transmission of communications relating to the operation of a film crew, or to coordinate action during the filming of motion pictures.

Motion Picture Radio Service stations may communicate with other stations in the same service, and with Government stations where such communication is needed for cooperation and coordination of activities. They may not communicate with broadcast or auxiliary stations, or be used for direct transmission of program material to any broadcast or auxiliary station. For a more detailed explanation of permissible communications, see Sec. 11.151.

All communications in this service are to be limited to the minimum practicable transmission time, and some type of standard operating procedure must be employed by each licensee. Continuous radiation of an unmodulated carrier is prohibited, except when necessary for test purposes, or when specifically authorized in writing by the Commission.

The power which may be used by a station in the Motion Picture Radio Service is limited to the minimum required for satisfactory technical operation commensurate with the size of the area to be served and local conditions which affect radio transmission and reception. In cases of harmful interference, the Commission may order a change in power, or antenna height, or both.

All transmitter adjustments or tests during or coincident with the installation, servicing, or

maintenance of a Motion Picture Radio Station which may affect the proper operation of the station must be made by, or under the immediate supervision and responsibility of a first- or second-class commercial radio operator licensee. If use of radio telegraphy is contemplated, either a first- or second-class commercial radiotelegraph operator licensee is required.

Stations in the Motion Picture Radio Service which employ radiotelephony may be operated by persons holding a commercial radio license or permit of any class except the Aircraft Radiotelephone Operators Authorization. Under certain conditions, some of the stations may be operated by unlicensed persons, but in no case is the station licensee relieved of the responsibility for the station's proper operation, and as stated above all adjustments and tests require either a first- or second-class commercial radio operator. For a detailed discussion of operator requirements, see Sec. 11.154.

Motion Picture Radio Service stations may be remotely controlled if wire lines are used for the control.

## Frequencies Used For Motion Picture Radio Service Stations

All assignments of frequencies to base and mobile stations in the Motion Picture Radio Service are on a *shared basis with other services*:

Certain other frequencies are available to the Motion Picture Radio Service for use in developmental operations for the service, but only the frequencies available for assignment without this limitation are shown below. For lists of developmental operations frequencies, see Sec. 11.402 (b), 11.403 (b), and 11.404 (c).

### Base and Mobile Stations

Frequency	Type of Emission	Notes
1628 Kc	8-A-3 or 40-F-3	All shared with other services.
1652 Kc 2292 Kc*		*Also subject to the conditions that harmful interference shall not be caused to the service of any station not in the Industrial Radio Service which, at the discretion of the Commission, may have priority on the frequency or frequencies used for the service to which interference is caused.
2398 Kc*		
4637.5 Kc**		
49.70 Mc		

Frequency	Type of Emission	Notes
49.74 Mc		**Limited to daytime use only, with maximum plate power input to final radio frequency stage not to exceed 100 watts.
49.78 Mc		
49.82 Mc		Also subject to change when the Atlantic City table of frequency allocations between 4 Mc and 27.5 Mc comes into force.
152.87 Mc***		
152.93 Mc***		
152.99 Mc***		***These frequencies are available for assignment to remote pickup stations and the same transmitting equipment may be cross-licensed as a remote pickup station under which license it could perform the services of a remote pickup station.
173.225 Mc		
173.275 Mc		
173.325 Mc		
173.375 Mc		

### Operational Fixed Stations

Subject to the condition that no harmful interference will be caused to reception of television channel numbers 4 or 5, the following frequencies are available for assignment to operational fixed stations in the Motion Picture Radio Service on a shared basis with other services.

The type of emission employed for these stations is either 8-A-3 or 40-F-3.

72.02 Mc	72.82 Mc	73.66 Mc	74.50 Mc
72.06 Mc	72.86 Mc	73.70 Mc	74.54 Mc
72.10 Mc	72.90 Mc	73.74 Mc	74.58 Mc
72.14 Mc	72.94 Mc	73.78 Mc	75.42 Mc
72.18 Mc	73.02 Mc	73.82 Mc	75.46 Mc
72.22 Mc	73.06 Mc	73.90 Mc	75.50 Mc
72.26 Mc	73.10 Mc	73.94 Mc	75.54 Mc
72.30 Mc	73.14 Mc	73.98 Mc	75.58 Mc
72.34 Mc	73.18 Mc	74.02 Mc	75.62 Mc
72.38 Mc	73.22 Mc	74.06 Mc	75.66 Mc
72.42 Mc	73.26 Mc	74.10 Mc	75.70 Mc
72.46 Mc	73.30 Mc	74.14 Mc	75.74 Mc
72.50 Mc	73.34 Mc	74.18 Mc	75.78 Mc
72.54 Mc	73.38 Mc	74.22 Mc	75.82 Mc
72.58 Mc	73.42 Mc	74.26 Mc	75.86 Mc
72.62 Mc	73.46 Mc	74.30 Mc	75.90 Mc
72.66 Mc	73.50 Mc	74.34 Mc	75.94 Mc
72.70 Mc	73.54 Mc	74.38 Mc	75.98 Mc
72.74 Mc	73.58 Mc	74.42 Mc	
72.78 Mc	73.62 Mc	74.46 Mc	

### Citizens Radio Service

Rules and regulations governing the Citizens Radio Service are found in Part 19, which begins with this statement of basis and purpose:

"The following rules and regulations are issued pursuant to the provisions of Title III of the Communications Act of 1934, as amended, which vests authority in the Federal Communications Commission to regulate radio transmissions and to issue licenses for radio stations. These rules are designed to provide for private short-distance radio communication, radio signaling, and control of objects or devices by radio, with minimum licensing requirements, and to provide procedures whereby manufacturers of radio and equipment to be used or operated in the Citizens Radio Service may obtain type approval of such equipment."

### Possible Uses of the Citizens Radio Service By Broadcasters

Class A and Class B Stations: Each station in the Citizens Radio Service is authorized to communicate *only with other stations in the same service*. Communications with stations licensed under other parts of the FCC rules, such as radio broadcast or auxiliary broadcast stations is prohibited. Citizens Radio Service stations, where authorized by the FCC, may be used as a privately owned mobile radiotelephone, as a privately owned radiotelephone circuit for any combination of broadcast station offices/studios/transmitter/home of a staff member licensed in this service, or as a cue and order circuit when the radio or television station is ineligible for a cue and order circuit under Part 4 of the FCC Rules. They may also be used for communications purposes in connection with adjustment and maintenance of antenna systems or in connection with field intensity surveys.

Transmissions must, however, be confined to business or personal communications; they may not be used to carry program material of any kind, either directly or indirectly, for use in connection with radio broadcasting, or for direct transmission to the public through public address systems or any other means. The stations may not be used to carry communications for hire, or for any purpose contrary to federal, state or local law.

Citizens Radio Service transmissions may be made at any time during day or night, but must be limited to the minimum practicable transmission time. An unmodulated carrier wave may not be emitted except for brief tests or during adjustments to the transmitter.

Refer to Sec. 19.59 for full text on permissible communications, particularly if interested in possible use of this service in connection with radiotelegraphy.

Class C Stations: Class C stations may be used only for radio control of objects and devices. They would provide a means of radio controlled alarm devices, or could be used to open and shut doors for convenience in moving scenery in television stations, or other uses of a similar nature.

### Eligibility for Use of the Citizens Radio Service

No hard and fast definitions of "eligibility" for the Citizens Radio Service may be laid down. In general, the Commission will not authorize the use of one service if the applicant is eligible for a like assignment in another service. This policy would preclude the use of a Citizens Radio Service station as a cue and order circuit where the station had a radio studio-transmitter link and thus could apply for a radio cue and order circuit in Part 4 of the Rules. Applications must clearly show (1) what use is intended to be made of the stations, and (2) why the applicant is not eligible to conduct the proposed operation under the rules governing some other service.

Any individual, partnership, association, trust, corporation, or duly authorized Civil Defense organization may apply for a Citizens Radio Service license, provided:

- (a) Not more than one person shall be eligible as licensee of the same apparatus, and,
- (b) The licensee must be eighteen years of age or older, and,
- (c) The licensee must be a United States citizen.

### Frequencies Used for Citizens Radio Service Stations

The following frequency bands are assigned to Citizens Radio Service stations. *Assignments are made on a non-exclusive basis* and are subject to such interference as may be received from other stations in this service.

Frequency Band	Class of Station	Max. Power (Input)	Frequency Tolerance	Bandwidth Not To Exceed
27.255 Mc	C	5 watts	±0.04%	10 Kc
460-462 Mc	A	50 watts	±0.02%	200 Kc
462-468 Mc	A	10 watts	±0.02%	200 Kc
468-470 Mc	A	50 watts	±0.02%	200 Kc
465 Mc	B	10 watts	All operation (including tolerance and bandwidth occupied by the emission) shall be confined to within ±0.5% of the frequency 465 Mc.	

For limitations on antenna heights, see Sec. 19.17 and 19.57.

## SUMMARY OF FREQUENCIES USED BY THE BROADCAST SERVICES

Frequency or Band	Use	Exclusive to Broadcast Service
535-1605 Kc	107 AM Channels	Yes
1606 Kc } 1622 Kc }	Remote Pickup Broadcast	Yes
1628 Kc	Motion Picture Radio Service (Base and Mobile Stations)	No
1646 Kc	Remote Pickup Broadcast	Yes

Citizens Radio Service stations, when employing radiotelephony, may be operated by any person designated by the licensee, but the licensee will be held responsible for the operation of the station in accordance with all applicable provisions of treaty, laws, and regulations. The operator need hold no special license, however, *all transmitter adjustments or tests during or coincident with the installation, servicing, or maintenance of a Citizens Radio Station which may affect the proper operation of the station must be made by, or under the immediate supervision and responsibility of a first- or second-class radiotelephone operator licensee.* If use of radio telegraphy is contemplated, see Sec. 19.51(b) for operator requirements.

The license for a Citizens Radio Service station is issued for a term of five years from date of issuance.

Either amplitude, phase, or frequency modulation may be employed for radiotelephony on Class A and Class B Citizens Radio Service stations. Class C stations may be used only for remote control of objects and devices; and except when used to control model aircraft, may use only on-off unmodulated or amplitude tone modulated carrier. See Sec. 19.35 for other permissible types of modulation for radio control of model aircraft or radio telegraphy.

<i>Frequency or Band</i>	<i>Use</i>	<i>Exclusive to Broadcast Service</i>
1652 Kc } 2292 Kc } 2398 Kc } 4637.5 Kc }	Motion Picture Radio Service (Base and Mobile Stations)	No
26.11-26.47 Mc	19 Remote Pickup B/c Stations	Yes
27.255 Mc	Citizens Radio Service—Radio Control only	No
49.70-49.82 Mc	4 Motion Picture Radio Service Stations—Base and Mobile	No
54-72 Mc	TV Channels 2-4	Yes
72-76 Mc	78 Motion Picture Radio Serv. Operational and Fixed Stations	No
76-88 Mc	TV Channels 5 & 6	Yes
88-92 Mc	20 Non-commercial FM Channels	Yes
92-108 Mc	80 Commercial FM Channels	Yes—except in Hawaii where the 98-108 Mc portion is assigned to Fixed Services and is not used for FM Broadcast.
152.87-153.35 Mc	9 Remote Pickup B/c Stns.	No—shared with Industrial Services which have first priority of use.
152.87-152.99 Mc	3 Motion Picture Radio Serv. Stations—Base and Mobile	No
166.25 Mc } 170.15 Mc }	Remote Pickup Broadcast	No—Government stations operating on these two frequencies must be protected.
173.225-173.375 Mc	4 Motion Picture Radio Serv. Stations—Base and Mobile	No
174-216 Mc	TV Channels 7-13	Yes
450-451 Mc } 455-456 Mc }	20 Remote Pickup B/c Stns.	Yes
460-470 Mc	Citizens Radio Service Class A and B Stations	No
470-890 Mc	TV Channels 14-83	Yes
890-911 Mc	41 TV Sound Channels	No—experimental stations are allowed to operate in this band.
925-940 Mc	29 AM STL Stations	No—experimental stations are allowed to operate in this band.
940-952 Mc	23 FM STL Stations	Yes
1990-2110 Mc	7 TV Pickup/STL/Inter-city Relay Stations	Yes
2450-2500 Mc	3 TV Pickup/STL/Inter-city Relay Stations	No—must accept interference from I-S-M services. Also used by Fixed and Mobile Services.
6875-7050 Mc	7 TV Pickup/STL/Inter-city Relay Stations	Yes
7050-7125 Mc	3 TV Pickup/STL Stations	Yes—but temporarily to be used by common carriers to provide service to broadcasters.
10500-10700 Mc	8 TV Pickup/STL/Inter-city Relay Stations	No—must accept interference from I-S-M services. Also used by Fixed and Mobile Services.
12700-13200 Mc	20 TV Pickup/STL/Inter-city Relay Stations	Yes