

Dockets

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

MM Docket No. 95-17

In the Matter of

Amendment of Parts 73 and 74 of the Commission's Rules to More Effectively Protect Radio Astronomy Activity on Channel 37 RM-8109

NOTICE OF PROPOSED RULE MAKING

Adopted: January 27, 1995; Released: February 21, 1995

Comment Date: March 31, 1995
Reply Comment Date: April 21, 1995

By the Commission:

INTRODUCTION

1. We hereby propose a number of actions designed to protect radio astronomy operations on Channel 37 of the UHF television broadcasting band. Specifically, we propose to amend Parts 73 and 74 of our rules to include the geographical coordinates of thirteen radio astronomy sites where TV Channel 37 frequencies (608 - 614 megahertz) are used for radio astronomy observations. We also propose a means by which such sites may be protected from interference by television stations operating on Channels 36 and 38. We further propose that the one currently authorized TV station which does not provide the proposed protection would be allowed to continue operating with its authorized facilities, but would not be allowed to increase its field strength in the direction of the affected radio astronomy site. Finally, we propose to delete one vacant TV allotment that is located near one of the radio astronomy sites.

BACKGROUND

2. In 1963, the Commission adopted a *Report and Order* which reserved TV Channel 37 exclusively for radio astronomy service for a period of ten years.¹ This reservation was continued and finally made permanent through a number of actions taken from 1975 to 1986.² Footnote US74 in Section 2.106 of the Commission's Rules states in part that "the radio astronomy service shall be protected from

extraband radiation only to the extent that such radiation exceeds the level which would be present if the offending station³ were operating in compliance with the technical standards or criteria applicable to the service in which it operates." Thus, a radio astronomy site is afforded only limited and uncertain protection by the rules. Our rules do not identify the locations of radio astronomy operations using Channel 37, which prevents TV station applicants from considering these operations as they design their proposed TV facilities. As a result, the Commission could properly but inadvertently authorize TV facilities at locations closer to radio astronomy observation sites than may be desirable.

3. To prevent such actions in the future, the National Academy of Sciences' Committee on Radio Frequencies (CORF) petitioned the Commission to amend the rules to include the locations of thirteen radio astronomy sites that currently or will make use of Channel 37, to adopt an 87.7 kilometer (54.5 mile) separation requirement applicable to adjacent channel television stations and to delete Channel 38 at Hilo, Hawaii, from the TV Table of Allotments.⁴

DISCUSSION

4. In its petition at page 4, CORF, citing Commission statements and rules, argues that radio astronomy operations are entitled to protection equivalent to that enjoyed by a television station operating on a UHF-TV channel, including an explicit distance separation requirement. We disagree. We believe the proper construction to be placed on the proceedings and rules cited by CORF in its petition is that, while radio astronomy facilities will be authorized to exclusively use Channel 37, no protection from adjacent channel TV transmissions will be provided, other than what results from regulatory limitations on TV station facilities and out-of-band emissions.

5. While we do not agree with CORF's argument that our past decisions entitle radio astronomy use of Channel 37 to site protection, we nevertheless believe that CORF's proposal merits consideration. We wish to examine whether some additional protection can be afforded to radio astronomy sites without significant adverse impact on broadcast services. We recognize that the sensitivity of radio astronomy equipment today is undoubtedly much greater than it was in 1963. Obtaining full benefit from radio astronomy studies may be facilitated by new precautions intended to limit the generation of man-made emissions on Channel 37 in the vicinity of the designated radio astronomy sites. We also note that the identified radio astronomy locations are mostly in rural areas. We seek comment on whether TV spectrum is scarce in any of these areas, either for the existing TV service or considering the new advanced TV service that we are proposing in MM Docket No. 87-268.

¹ *Report and Order*, Docket No. 15022, 39 FCC 884 (1963).

² *Order*, 53 FCC 2d 627 (1975) (Channel 37 reservation extended through WARC-79); *Second Report and Order*, Gen. Docket No. 80-739, 49 Fed. Reg. 2357 (January 19, 1984) (amending Footnote US 246 to the U.S. Table of Frequency Allocations to implement domestically the WARC-79 reallocation of Channel 37 to the radio astronomy service); *Order*, Mimeo 4385 (released May 12, 1986) (amending

§73.603(c) to reflect this reallocation).

³ Because no stations of any type are authorized on Channel 37 the term "offending station" should be construed as a reference to stations operating on adjacent Channels 36 and 38.

⁴ The Hilo allotment, at 39.3 kilometers (24.4 miles) from the Mauna Kea radio astronomy facility, is within the requested separation distance.

6. We also request comments on an alternative approach which is functionally equivalent to the one advocated by CORF but which is more flexible than a fixed distance separation requirement and thus less burdensome to broadcasters. As set forth in Appendix A, we propose to set a limit on the field strength that a TV station on Channel 36 or 38 could produce at the coordinates of radio astronomy sites designated by CORF. This alternative would not include a distance separation requirement. Basing the proposed protection on field strength will permit stations to be located closer to the radio astronomy sites than the fixed distance separation would allow, if the signal radiated toward the radio astronomy site is suppressed by an appropriate amount.

7. In accordance with Section 73.614 of our rules, a full service UHF TV station can have a peak visual effective radiated power (ERP) of 5 megawatts (MW) at an antenna height above average terrain (HAAT) of 610 meters (2,000 feet). These facilities would deliver a field strength of approximately 72 dBu at 87.7 kilometers.⁵ However, we believe that CORF may not have intended to imply that a 72 dBu field strength restriction would provide adequate protection. A lower field strength value is more consistent with the power and antenna height at which UHF-TV stations typically operate. Rather than using maximum allowable facilities, a more typical UHF station has an ERP between 1 and 5 MW and an antenna HAAT in the vicinity of 350 meters (1150 feet). These facilities produce a field strength of 57 to 64 dBu at 87.7 kilometers. We propose to use 64 dBu as the limit on the field strength that a Channel 36 or 38 TV station is permitted to produce at a radio astronomy site.

8. Another concern leads us to propose the 64 dBu value in lieu of 72 dBu. The frequency band that might receive interference is actually in the adjacent Channel 37. An applicant for a TV station requesting use of a directional antenna specifies the radiation pattern it will employ for its on-channel performance; however, a directional antenna is frequency sensitive and may produce a different pattern for any energy it may radiate on adjacent channels. Therefore, this fact suggests we should adopt a relatively conservative field strength value for purposes of radio astronomy site protection.

9. We propose to apply the same field strength limit to low power TV stations, TV translators and TV boosters. Since such stations operate with significantly smaller facilities than full service UHF-TV stations, our proposed ap-

proach would permit them much greater flexibility in terms of location, while providing the radio astronomy sites a level of protection equal to that provided by the more powerful full service stations. Compliance with the field strength restriction would be determined using the standard prediction methods and the Commission's F(50,50) propagation curves. Comments should address whether 72 dBu, 64 dBu or some other field strength value provides adequate protection for the Channel 37 radio astronomy operations and whether these values impose a significant burden on TV use of these two channels. Parties that favor a fixed separation distance as proposed by CORF should identify the distance they believe is correct and support their choice.

10. CORF also indicates that it does not oppose the Commission's "grandfathering" of existing stations and stations for which a construction permit has been authorized on Channels 36 and 38. CORF requests that extension or reinstatement of expired construction permits be conditioned upon using a different channel.⁶ CORF urges the Commission to require applicants for new stations on Channel 36 or 38 to amend their applications to specify a different channel, if feasible.

11. We do not believe that action on CORF's proposed "grandfathering" provision is necessary. A review of Commission records indicates that only one full service TV station currently operates with facilities that produce a predicted field strength in excess of 64 dBu at any of the identified radio astronomy sites. WJWN-TV, Channel 38, San Sebastian, PR, is licensed at an ERP of 85.1 kW and HAAT of 332 meters (m). At 90 degrees True, which is toward the Arecibo radio astronomy site, the WJWN-TV facilities are 85.1 kW at 232 m. With the distance between sites of 45.1 kilometers (km), the predicted field strength at the radio astronomy facility is 67 dBu. While no other station currently authorized on Channels 36 or 38 would exceed the proposed field strength of 64 dBu, there are three other full service stations that would be precluded from increasing to the maximum normally permitted facilities by adoption of the proposed protection standard.⁷

12. In light of the preceding discussion, we believe that a general grandfathering provision, covering any existing or proposed facilities, is unnecessary. We propose to consider the WJWN-TV situation discussed above as a waiver of the proposed rule. WJWN-TV would not be permitted to modify its facilities in such a way as to increase its predicted field strength at the Arecibo radio astronomy site. We

⁵ All field strength calculations used in this Notice are derived using the Commission's F(50,50) propagation curves and refer to the field strength of the TV signal on the assigned frequency.

⁶ CORF petition, p. 15.9

⁷ KOCT (TV), on Channel 36 in Davenport, IA, is 87.1 km (54.1 miles) from the North Liberty, IA radio astronomy facility. It is currently licensed at a main lobe ERP of 6.03 kW and an HAAT of 65 m. The proposed 64 dBu restriction would limit any increase in future facilities to roughly 5,000 kW ERP at 340 m HAAT or 850 kW ERP at 610 m HAAT in the direction of the radio astronomy facility.

WSBK-TV, on Channel 38 in Boston, MA, is 94.2 km (58.5 miles) from the Hancock, NH radio astronomy facility. It is currently licensed at an ERP of 2,340 kW and an HAAT of 354 m. The proposed 64 dBu restriction would limit any increase in future facilities to roughly 5,000 kW ERP at 425 m HAAT or 1600 kW ERP at 610 m HAAT in the direction of the radio astronomy facility.

WDWL (TV), on Channel 36 in Bayamon, PR, is 68.3 km (42.4 miles) from the Arecibo, PR radio astronomy facility. It is currently licensed at an ERP of 9.33 kW and an HAAT of 329 m. The proposed 64 dBu restriction would limit any increase in future facilities to roughly 650 kW ERP at 329 m HAAT in the direction of the radio astronomy facility.

Our review of the TV engineering data base also indicates that no low power TV, TV translator or TV booster station is authorized facilities or applying for facilities that would exceed a predicted field strength of 64 dBu at any of the radio astronomy sites. There is one low power TV station construction permit (K38DR in Cedar Rapids, IA) that is 29.1 km (18 miles) from the North Liberty, IA, radio astronomy facility. This station is currently authorized an ERP of 9.7 kW and its HAAT in the direction of North Liberty was determined to be 131 m using a Commission computer program and topographic data base. It thus appears to deliver a field strength of 63.9 dBu at the North Liberty radio astronomy site.

propose that all other existing and future stations would be required to comply with the proposed 64 dBu limit when planning future facilities.

13. Additionally, we request comment on whether we should also require applicants for new facilities (or those proposing to modify existing facilities) on Channel 36 or Channel 38 that would be within 87.7 kilometers (55 miles) of a listed radio astronomy site to notify CORF (or some other appropriate radio astronomy representative) concerning their proposed facilities. We believe that the proposed rules, coupled with our application processing procedures, are probably sufficient to ensure protection to radio astronomy facilities. However, we ask whether notification procedures similar to those contained in Section 73.1030 would serve any useful purpose. Moreover, if such notification is considered expedient, we ask for comment on the most appropriate entity to notify. While the proposed rules do not contain a notification requirement, we may adopt such a requirement if the comments indicate that a significant benefit may be afforded by such notification.

14. Finally, with respect to the allotment aspects of CORF's petition, we propose to delete the Channel 38 allotment currently specified for Hilo, Hawaii. We note that this proposal appears to have only a very minimal impact on the TV broadcast service because both channels 20 and 26 would remain available as vacant non-reserved channel allotments in Hilo. Further, we propose to require that petitions for rulemaking proposing Channel 36 or 38 allotments which would be located within 87.7 kilometers (55 miles) of a radio astronomy site, must demonstrate compliance with the radio astronomy facility protection criteria adopted as a result of this proceeding. The proposed rule changes are indicated in Appendix A.

ADMINISTRATIVE MATTERS

Ex Parte Rules -- Non-Restricted Proceeding

15. This is a non-restricted notice and comment rulemaking proceeding. *Ex parte* presentations are permitted, except during the Sunshine Agenda period, provided they are disclosed as provided in Commission rules. See generally 47 C.F.R. §§1.1202, 1.1203 and 1.1206(a).

Comment Information

16. Pursuant to applicable procedures set forth in §§ 1.415 and 1.419 of the Commission's Rules, 47 C.F.R. §§ 1.415 and 1.419, interested parties may file comments on or before March 31, 1995 and reply comments on or before April 21, 1995. To file formally in this proceeding, you must file an original plus four copies of all comments, reply comments, and supporting comments. If you want each Commissioner to receive a personal copy of your comments, you must file an original plus nine copies. You should send comments and reply comments to Office of the Secretary, Federal Communications Commission, Washington, D.C. 20554. Comments and reply comments will be available for public inspection during regular business hours in the FCC Reference Center (Room 239), 1919 M Street, N.W., Washington, D.C. 20554.

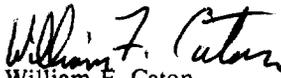
Regulatory Flexibility Act

17. An Initial Regulatory Flexibility Analysis is contained in Appendix B of this Notice of Proposed Rule Making.

Additional Information

18. For additional information on this proceeding, contact James E. McNally, Jr., Mass Media Bureau, (202) 776-1671.

FEDERAL COMMUNICATIONS COMMISSION


William F. Caton
Acting Secretary

APPENDIX A

Parts 73 and 74 of Title 47 of the Code of Federal Regulations are proposed to be amended as follows:

PART 73 - RADIO BROADCAST SERVICES

1. The authority citation for Part 73 continues to read as follows:

Authority: 47 U.S.C. 154, 303, 334.

2. Section 73.606(b) would be amended by removing the entry Hilo, Hawaii, Channel 38.

3. Section 73.611 would be amended by adding paragraph (a)(5) to read as follows:

§73.611 Reference points and distance computations.

(a) * * *

(5) If the reference point for a proposed new allotment on either Channel 36 or Channel 38 is within 87.7 kilometers (55 miles) of a radio astronomy site specified in Section 73.613(b), the channel may be allotted to such community based upon a showing that a station could be authorized in conformance with Section 73.613.

* * * * *

4. A new Section 73.613 would be added to read as follows:

§73.613 Channel 37 radio astronomy protection.

(a) An application to construct a new TV station on Channel 36 or 38, or to change the facilities of an existing station on Channel 36 or 38 will not be accepted if the field strength of the proposed station would exceed 64 dBu at any of the Channel 37 radio astronomy locations set forth in paragraph (b) of this section. The field strength

must be calculated using the horizontally polarized visual effective radiated power in the pertinent direction, the antenna height above average terrain in the pertinent direction determined in accordance with Section 73.684(d), and the F(50,50) curves in Section 73.699, Figure 10b.

(b) Channel 37 is used for radio astronomy at the following locations:

Location	N. Latitude	W. Longitude
Kitt Peak, AZ	31 ⁰ .57'.23"	111 ⁰ .36'.45"
Owens Valley, CA	37 ⁰ .13'.54"	118 ⁰ .16'.34"
Mauna Kea, HI	19 ⁰ .48'.16"	155 ⁰ .27'.29"
North Liberty, IA	41 ⁰ .46'.17"	91 ⁰ .34'.27"
Hancock, NH	42 ⁰ .56'.01"	71 ⁰ .59'.12"
Los Alamos, NM	35 ⁰ .46'.31"	106 ⁰ .14'.44"
Pie Town, NM	34 ⁰ .18'.04"	108 ⁰ .07'.09"
Socorro, NM	34 ⁰ .03'.43"	107 ⁰ .37'.04"
Arecibo, PR	18 ⁰ .20'.46"	66 ⁰ .45'.11"
Fort Davis, TX	30 ⁰ .38'.06"	103 ⁰ .56'.41"
Saint Croix, VI	17 ⁰ .45'.31"	64 ⁰ .35'.03"
Brewster, WA	48 ⁰ .07'.52"	119 ⁰ .41'.00"
Green Bank, WV	38 ⁰ .25'.59"	79 ⁰ .25'.59"

PART 74 - EXPERIMENTAL, AUXILIARY, AND SPECIAL BROADCAST AND OTHER PROGRAM DISTRIBUTIONAL SERVICES

5. The authority citation for Part 74 continues to read as follows:

Authority: Secs. 4, 303, 48 Stat. 1066, as amended, 1082, as amended, 47 U.S.C. 154, 303, 554.

6. A new Section 74.711 is added to read as follows:

§74.711 Channel 37 radio astronomy protection.

An application to construct a new low power TV, TV translator or TV booster station on Channel 36 or 38, or to change the facilities of an existing station on Channel 36 or 38 will not be granted if the field strength of the proposed station would exceed 64 dBu at any of the radio astronomy locations set forth in Section 73.613(b) of this Chapter. The field strength must be calculated in accordance with the procedure set forth in Section 73.613(a) of this Chapter.

APPENDIX B

INITIAL REGULATORY FLEXIBILITY ANALYSIS

As required by §603 of the Regulatory Flexibility Act, the Commission has prepared the following Initial Regulatory Flexibility Analysis (IRFA) of the expected impact on small entities of the proposals suggested in this document. Written public comments are requested on the IRFA. These comments must be filed in accordance with the same filing deadlines as comments on the rest of the *Notice*, but they must have a separate and distinct heading designating them as responses to the Initial Regulatory Flexibility Analysis. The Secretary shall send a copy of this *Notice of Proposed Rule Making*, including the IRFA, to the Chief Counsel for Advocacy of the Small Business Administration in accordance with paragraph 603(a) of the §Regulatory Flexibility Act (Pub. L. No. 96-354, 94 Stat. 1164, 5 U.S.C. § 601 *et seq.* (1981)).

Reason for Action

Footnote US74 to the Table of Frequency Allocations contained in Section 2.106 of the Commission's rules specifies that radio astronomy facilities using the spectrum 608 to 614 MHz (TV Channel 37) are to "be protected from extraband radiation only to the extent that such radiation exceeds the level which would be present if the offending station were operating in compliance with the technical standards or criteria applicable to the service in which it operates." This language is not sufficiently clear to precisely establish the protection that radio astronomy facilities should be afforded. Also, because the locations of radio astronomy facilities were not known to broadcast applicants, the Commission has authorized construction of full service and low power television stations in close proximity to radio astronomy facilities, thereby potentially causing interference.

Objectives

This action is intended to eliminate the possibility of future authorization of facilities in excessive proximity to radio astronomy operations. The Commission proposes to amend its rules to specify the latitude and longitude of thirteen radio astronomy sites and to impose a simple field strength restriction that would apply to stations authorized on adjacent channels (i.e., Channels 36 and 38). This would effectively preclude interference to radio astronomy facilities.

Legal Basis

Authority for the actions proposed in this *Notice* may be found in Sections 4 and 303 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154 and 303.

Reporting, Recordkeeping, and Other Compliance Requirements

None.

Federal Rules which Overlap, Duplicate, or Conflict with the Proposed Rule

None.

Description, Potential Impact and Number of Small Entities Involved

Because radio astronomy installations are located in rural areas, the number of station applications which may be affected by the field strength requirement should be very small, perhaps averaging less than one per year. In such cases, the applicant would need to design the facilities to limit the field strength produced at the radio astronomy site or possibly select another site. But because the protection requirement would be known in advance, there would be no relocation cost. There would be no impact on current broadcast licensees.

**Any Significant Alternatives Minimizing the Impact on
Small Entities and Consistent with the Stated Objectives**

There are none apparent.