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

The Commission also proposes a means by which such sites may be protected from interference by television stations operating on Channels 36 and 38. Further proposed is 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, the Commission proposes to delete one vacant TV allotment that is located near one of the radio astronomy sites.

## Background

2. The Commission has reserved TV Channel 37 exclusively for radio astronomy service. 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 levels 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." Thus, a radio astronomy site is afforded any limited and uncertain protection by the rules. The Commission's 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.

## Discussion

4. The Commission believes that CORF's proposal merits consideration and wishes to examine whether some additional protection can be afforded to radio astronomy sites without significant adverse impact on broadcast services. The Commission recognizes that the sensitivity of radio astronomy equipment today is undoubtedly much greater than it was in 1963. Also, the identified radio astronomy locations are mostly in rural areas. Comment is sought on whether TV spectrum is scarce is any of these areas, either for the existing TV service or considering the new advanced TV service that the Commission is proposing in MM Docket No. 87-268.

5. The Commission also requests 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. The Commission proposes 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. 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.

A maximum facility UHF–TV station would deliver a field strength of approximately 72 dBu at 87.7 kilometers. However, the Commission believes 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 effective radiated power (ERP) between 1 and 5 MW and an antenna height above average terrain (HAAT) in the vicinity of 350 meters (1150 feet). These facilities produce a field strength of 57 to 64 dBu at 87.7 kilometers (km). Thus, the Commission proposes 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.

7. The Commission proposes 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, the proposed approach 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.

8. 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 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. They are KQCT (TV) on Channel 36 in Davenport, Iowa, WSBK-TV on Channel 38 in Boston, Massachusetts and WDWL (TV) on Channel 36 in Bayamon, Puerto Rico.

9. In light of the preceding discussion, the Commission believes that a general grandfathering provision, covering any existing or proposed facilities, is unnecessary. The WJWN–TV situation discussed above would be considered 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. All other existing