ENGINEERING STATEMENT (continued)

would be less than those specified above, since the modulation scheme employed with most BTDs are different than those used for the transmission of television signals.

Using the methodology described above, the predicted radius of potential interference to other nearby television stations was greater at VHF frequencies than at UHF. As noted in CCTG's original filing, the predicted distance to the BTD interfering contour was determined to be approximately 43.5 meters at VHF frequencies. At UHF the predicted distance to the interfering contour was only 6.2 meters. At both UHF and VHF, a 20 dB attenuation factor was incorporated. However, as further shown in CCTG's original filing, even if no signal attenuation factor (of 20 dB) is applied at UHF frequencies, the predicted distance to the interfering contour of the telemetry unit would be 61.5 meters. This is only 18 meters greater than that calculated for VHF frequencies, incorporating a 20 dB signal attenuation factor.

As previously noted, the current operation of LPASs on television frequencies proposed in the NPRM has not led to any increased interference to television stations. These stations are permitted to operate with much higher power than those proposed for use by BTDs. Accordingly, by satisfying the separation requirements specified in the NPRM, no objectionable interference to television reception would result from the proposed operation of telemetry devices, particularly given that these units would likely employ modulation techniques different from those used with television[8]. Additionally, in the unlikely event that cases of interference to the TV reception occur as a result of adoption of the proposed rules, then under part 15 of the Rules, operators of BTDs would be responsible for taking all necessary steps to remedy the problem -- including cessation of operation.

[8] To reduce the potential for received interference, BTDs would operate on vacant television frequencies and would employ, as necessary, appropriate filters to reduce the level received spurious signals produced by other adjacent channel services or other outside sources.

ENGINEERING STATEMENT (continued)

Operation On "Taboo" Television Channels

In its comments to the Commission regarding the NPRM, the Consumer Electronics Manufacturers Association ("CEMA") contends that no consideration has been given to the potential for interference within a television receiver resulting from the operation of BTDs on UHF "taboo" channels. As discussed below, the potential for this type of interference is minimal.

In Part 73 of the Rules, the Commission has specified a number of minimum distance separation requirements between UHF television stations that operate on channels which are separated in frequency by certain "taboo' relationships. The taboo restrictions are principally designed to avoid interference to UHF television reception that might occur due to receiver characteristics.

In the NPRM it is appropriately proposed that BTDs operate with a maximum power of 5 milliwatts. Given the non-broadcast nature of the telemetry transmissions by these units in conjunction with the low power levels, the potential for interference on UHF taboo channels is insignificant. Moreover, improvements in the performance characteristics of television receivers have further reduced the potential for such interference.

As part of the Advanced Television ("ATV") proceeding, the Commission itself acknowledged that taboo restrictions may be unnecessary. In the Second Further Notice of Proposed Rulemaking, MM Docket No. 87-268, it notes that its own staff studies of NTSC receiver performance and spectrum availability indicate that UHF taboo channels may be used for ATV service. Accordingly, it has proposed no spacing restrictions on ATV transmitters operating on taboo frequencies.

Moreover, under the current FCC rules, Low Power Auxiliary Stations ("LAPS") are permitted to operate on the same frequencies specified in the NPRM and with a higher power than that proposed for BTDs. The Commission has not placed any restrictions on the operation of these stations when they operate on taboo frequencies. As noted in CCTG's original filing, the Commission is not aware of any complaints regarding the use of these frequencies by such stations. Given the

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minimal risk of interference to TV reception from BTDs and the higher power operation of another existing service on the proposed frequencies, it is unnecessary to restrict the operation of BTDs on taboo frequencies.

Protection of Auxiliary Facilities

In the comments of the Society of Broadcast Engineers, Inc. ("SBE"), it has been proposed that BTDs observe a minimum distance separation criteria with respect to television auxiliary facilities such as television boosters, LPTVs, TV translators and LPAS operating on the proposed television bands. SBE proposes a separation requirement of at least 80 kilometers to these stations. Given the proposed separation requirements specified in the NPRM and the low operating power of biomedical telemetry devices, SBE's proposal is unwarranted.

Under section 74.731 of the FCC rules, a television booster station may not be located outside the predicted grade B contour of its primary station nor may the predicted grade B signal of the television booster station extend beyond the predicted grade B contour of the primary station. The separation requirements contained in the NPRM provide protection to the grade B service contour of a full service station. These same separation requirements would also provide protection to the service contour of a television booster station, which would be within the primary station's service contour; thus making the imposition of another spacing requirement unnecessary.

With respect to LPTVs and television translators, a distance separation requirement is unnecessary. As a secondary service, these stations have limited areas of coverage. In general, if the signal from either of these types of stations can be viewed on a television receiver, the channel, in all likelihood, cannot be used by BTDs. Furthermore, taking into consideration the current protection requirements contained in section 74.707 of the Rules, the area of potential cochannel and first adjacent interference with respect to these stations would be less than those calculated for full service television facilities.

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Finally, with respect to LPAS stations, CCTG proposes that operators of these stations coordinate with the administration of health care facilities using BTDs in selecting frequencies and/or scheduling operation so as to avoid interference. Under current FCC rules, such coordination is required between low power auxiliary stations operating in the same area. As such, it would be illogical to apply a more restrictive distance separation criteria to BTDs which would operate at power levels much less than those permitted for LPAS stations.

Out-of-Band Emissions

In its filing of April 16, 1995 filing, CCTG proposed that the out-of-band emissions from BTDs be limited to 630 μV/m measured at 3 meters from the device. The proposed limit would require that the out-of-band emissions of the telemetry units be attenuated by at least 50 dB with respect to its inband emissions.

In its comments, the NAB proposes that the current limit of 150 μV/m be kept. NAB also states that even at this level, the out-of-band emissions from BTDs would be expected to cause interference to a television station's grade B service area.

Although the grade B contour of television stations is identified as being a protected service contour, it is not, however, interference free. A publication in IEEE's Transactions On Broadcasting shows that the grade B coverage of approximately 37 percent of existing UHF stations are impacted by the operation of at least one other cochannel station[9]. The grade B service area of approximately 50 percent of UHF stations is currently impacted by the operation of at least one other adjacent channel station located in its vicinity. For VHF stations, the percentages are comparable to those for UHF.

The proposed out-of-band emissions attenuation level of 50 dB are more restrictive than those specified for LPTV stations and LPAS stations, even though BTDs

[9] Donald M. Jansky, "Methods For Accommodation of HDTV Terrestrial Broadcasting," IEEE Transactions on Broadcasting, Volume 37, No. 4, pp. 152-157, December 1991.

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would operate at power levels far below those permitted for these facilities[10]. Consequently, Spurious emissions from these units will not significantly impact the level of interference within the grade B contours of surrounding television stations. Accordingly, no objectionable interference would result from the operation of BTDs.

May 23, 1996

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[10] Out-of-band emission requirements for LPTV and LPAS stations are contained in Sections 74.736(c)(1) and 74.861(e)(6) of the FCC Rules, receptively.