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co-channel stations multiplied, the problem of determining which systems should be taken into consideration in deciding whether a channel was fully occupied or not rapidly becomes an impossible one, at least at the present stage of development of our frequency management program.

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83. Accordingly, we plan to use the 15 and 25 mile radii specification. With this decided it is necessary to adjust mileage separations for conventional stations to account for the protected areas. Therefore, the frequency of urban-conventional systems, assignments on occupied co-channel frequencies will not be made unless the proposed site of the new facility is at least 85 miles from the geographic center of the Urbanized Area involved. As to suburban-conventional systems, assignments on occupied co-channel pairs will not be made unless the site of the proposed station is at least 70 miles from the first suburban co-channel station authorized and this is to be the rule regardless of whether the channel assigned to that station is fully occupied or not. 31/

Channel Loading Standards

In General

84. For channel loading, in the absence of actual experience and data, especially for trunked systems of radio communication of the type we have under consideration at 900 MHz, we felt we should rely on the number of mobile units in operation as a base from which to set up channel occupancy figures. We have used mobile units, for, over the years, in the land mobile services, we have developed a series of guides for determining the channel requirements of licensees in the several services.

85. For example, in the Police Radio Service, we have found that, as a general rule, a channel pair can be employed in an effective manner in dispatching 50 mobile units of the vehicular type and an even greater number of portable or hand carried units. In this we recognize that there are no two situations exactly alike and that there are many factors to be taken into account. Among them are average message length; the number of units in operation in any given time period; the number of times, each hour, the dispatcher and mobiles originate calls; the number of dispatchers on duty at any one time; the size of the system (the number of communication channels available for use at any one point in time); and, certainly, the nature of the functions and activities of the licensee. All of these factors have an impact on system capacity. Nevertheless, as an overall or average measure, we have determined that in

31/ In any case in which the proposed transmitter site is within the 15 and 25 mile radii, such application, of course, will be studied with co-channel stations in the protected areas, until such time as the channel is loaded in accordance with applicable standards. We would note, however, that all of these procedures are subject to further study and review, and based on day-to-day operating data, we may find they can be improved. Should this be so, appropriate steps will be taken to reflect this experience.

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the Police Radio Service, 50 vehicular mobile units per channel is a reasonable and realistic criterion to apply in licensing stations in that service.

86. This may be contrasted to the Business Radio Service. There, the frequencies allocated were intended to be shared more intensively, because they were designated to serve a much broader group of eligibles and there were inherent differences in the nature of the communications of businessmen and of police departments. Consequently, higher loading standards were employed, with each frequency or channel licensed to serve approximately 90 mobiles. In densely populated areas, where the demand for business frequencies turned out to be very great and message loads correspondingly heavy, this norm did not always provide licensees with the communication capacities they felt they needed. Nonetheless, overall, the 90 mobile criterion proved to be a good guide in licensing stations in the Business Service.

87. Similar conclusions have been arrived at as to frequency loading in the other services. To illustrate, in the Taxicab Radio Service, we know that a frequency pair can be employed effectively in dispatching 150 mobiles or more; and we have set channel loading in that service at a higher level. Further, the communication needs and requirements of licensees in the Power and Petroleum Radio Services are not the same as those in other radio services. This is in part due to the fact that radio facilities are used in different ways and for different purposes by licensees in the several services. But we have found that users can be grouped together for loading purposes; and that mobile units can serve as a good guide for frequency assignment purposes.

88. There is an added factor of some significance. Where a channel is assigned for the exclusive use of a particular licensee, circuit discipline of a high order can be maintained. It is relatively easy to do so, for the employees using the system are under the direct control of the licensee; and he has an interest in seeing to it that his messages to and from his mobile units are not delayed. Also, system monitoring can be performed in a more efficient manner, since station operators do not have to listen for the signals of other licensees. This eliminates, to a high degree, objectionable interference and message interruptions which cause inefficiencies. With these considerations in mind, we have differentiated between systems which are licensed to provide service to a single entity and those serving several licensees. In doing this, we have designated categories for single licensees; for 2 to 5 licensees; and for over 5 licensees. 32/

89. Summarizing, then, on the basis of the foregoing considerations and also from what we have learned from the vast record in this proceeding, we have developed the norms or general rules to assist us in determining when an assigned frequency is to be treated as occupied, or not occupied, in terms of its capacity to serve in an effective way the requirements of the users. We used this background in assisting us in setting the loading requirements at 900 MHz.

32/ See §89.802 of the new rules which deals with loading requirements for conventional systems.