

reduction from present channel costs of Intelsat I which became operational less than 4 years before the expected date of service of Intelsat III. In neither case, however, does this mean that we should have denied applications for the earlier generations of either cable or satellite because of our expectations that within a few years a better or cheaper facility would become available. Each generation of users is entitled to the best that technology can offer at a given time and must not be deprived of additional service because something better or cheaper will probably be operational within 3 to 5 years.

4. Commissioner Johnson is certainly accurate in pointing out that satellites and cables provide service through different distribution systems. However, the differences are not as great as he would imply. It is true that signals by way of a satellite may be transmitted between any two points from which the satellite is mutually visible. The "truth" is subject to a single but very important proviso, namely, that the two points desiring to communicate via satellite each must have an earth station. In the present state of the art and, according to information supplied to us by Comsat, for the foreseeable future such earth stations require relatively large initial investments and relatively high annual operating costs. Their ability to provide economical service is dependent upon high volume usage as there is no direct proportionate relationship between earth station investment or operating costs and the number of circuits handled. Thus, a country requiring 10 circuits does not have significantly different total earth station costs from one requiring several hundred circuits, but obviously the per circuit costs for the one having little traffic are higher by a great many magnitudes than those of the country whose earth station handles vastly larger volumes. In the cable technology the situation is entirely different. Thus, Portugal, which requires only about 10 circuits of the total of 720, will be required to invest less than 1½ percent of the overall costs of the TAT-5 system, a sum far less than would be required for it to construct its own earth station to satisfy such requirements. Its annual operating costs for the cable facilities will also be a relatively small fraction of the comparable costs for satellite facilities to satisfy the same requirement. In fact, one of the serious concerns with respect to the developing satellite system is the effect of the installation and operation of high capacity, high cost earth stations in countries having small traffic requirements upon the overall system costs.

5. It is certainly true that in the United States, where the earth stations now handle several hundred circuits and are expected to be handling several thousand in the near future, the per circuit costs will be relatively low. However, the cost in the near future, the per circuit costs will be relatively low. However, the cost for a through circuit between the United States and a country which has requirements for 10 circuits or fewer consists not only of the costs of our earth station and the space segment, but also includes the per circuit cost of the distant low usage earth station. I would hope that this problem would continue to receive careful consideration from Comsat and all other entities to the end that satisfactory service can be provided to economically less developed countries. Only if means are found to provide earth station facilities economically to countries with relatively low circuit requirements can Commissioner Johnson's statement that "the remotest point on earth, once equipped with an earth receiving station, can be reached as cheaply as a major urban center" be true. Until that is done, the cost of reaching "the remotest point on earth" via satellite will continue to be very high.

6. Comsat, in its statement of April 22, 1968, alleges that the specific comments in my concurring statement were confused and erroneous. Comsat makes lengthy comparisons between revenue requirements for the first four transatlantic cables (\$28,000), its charges per circuit to the carriers (\$45,600), and charges by the carriers to the public (\$78,000). It then alleges that the figure for carrier revenue requirements via the first four cables must be inaccurate because of the wide disparity between this figure and the charges to the public (\$50,000). The Comsat figures, however, do not provide an adequate basis for judging charges to public users for leased circuits. First, Comsat does not take into account that the figures it uses related to circuits with TASI, a device used to increase the number of usable circuits for toll message telephone service but not applicable to leased circuits. This device increases the equivalent number of voice grade circuits available to A.T. & T. for its services on the four existing transatlantic cables from 239 to 340, or an increase of 46.5 percent. Secondly, it does not consider the cost of handling traffic from the cable head to A.T. & T.'s central office in White Plains averaging several hundred dollars a month. Finally, it does not allow all