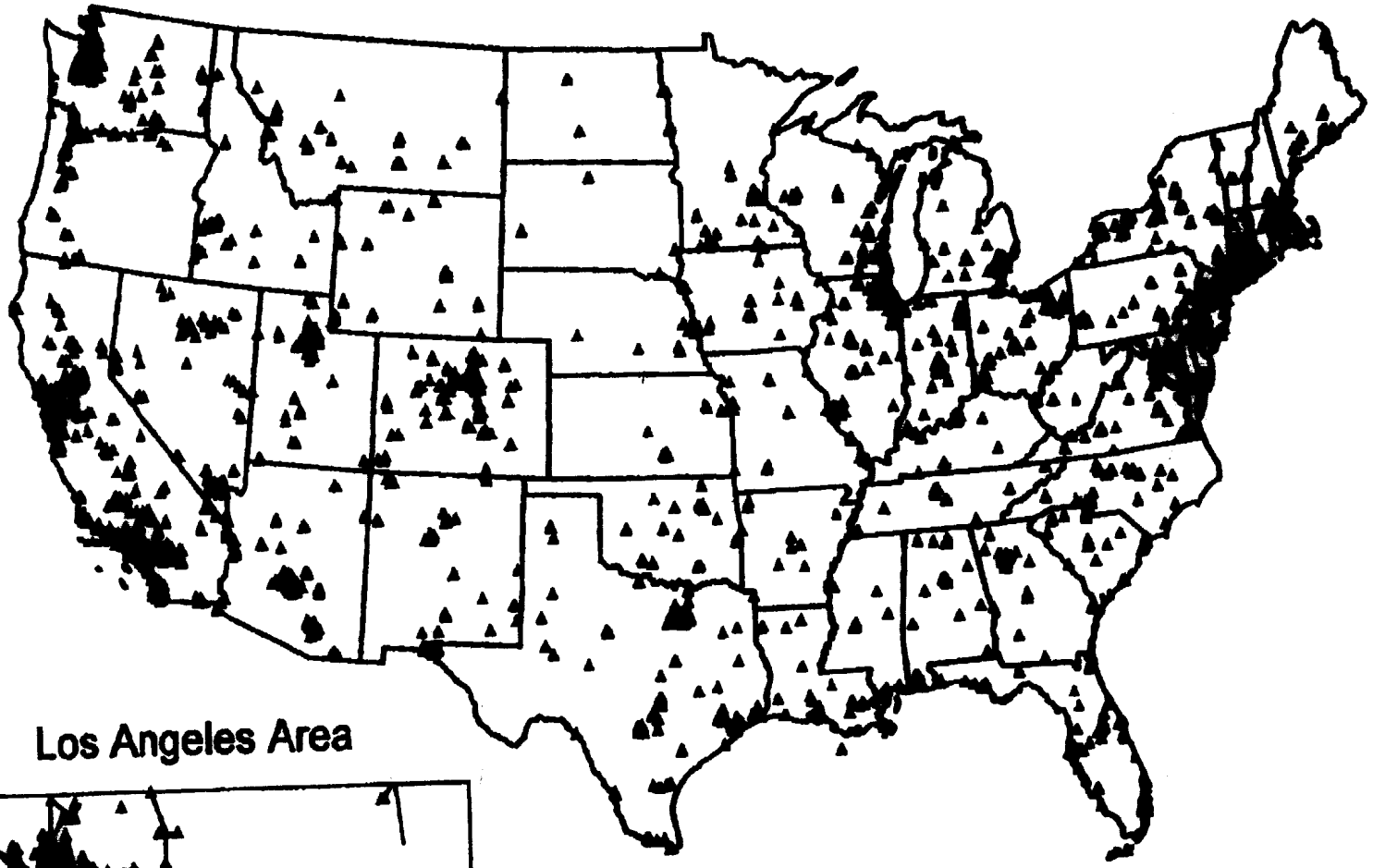
18 GHz Fixed Service Paths

17.7 - 19.7 GHz Band



Los Angeles Area

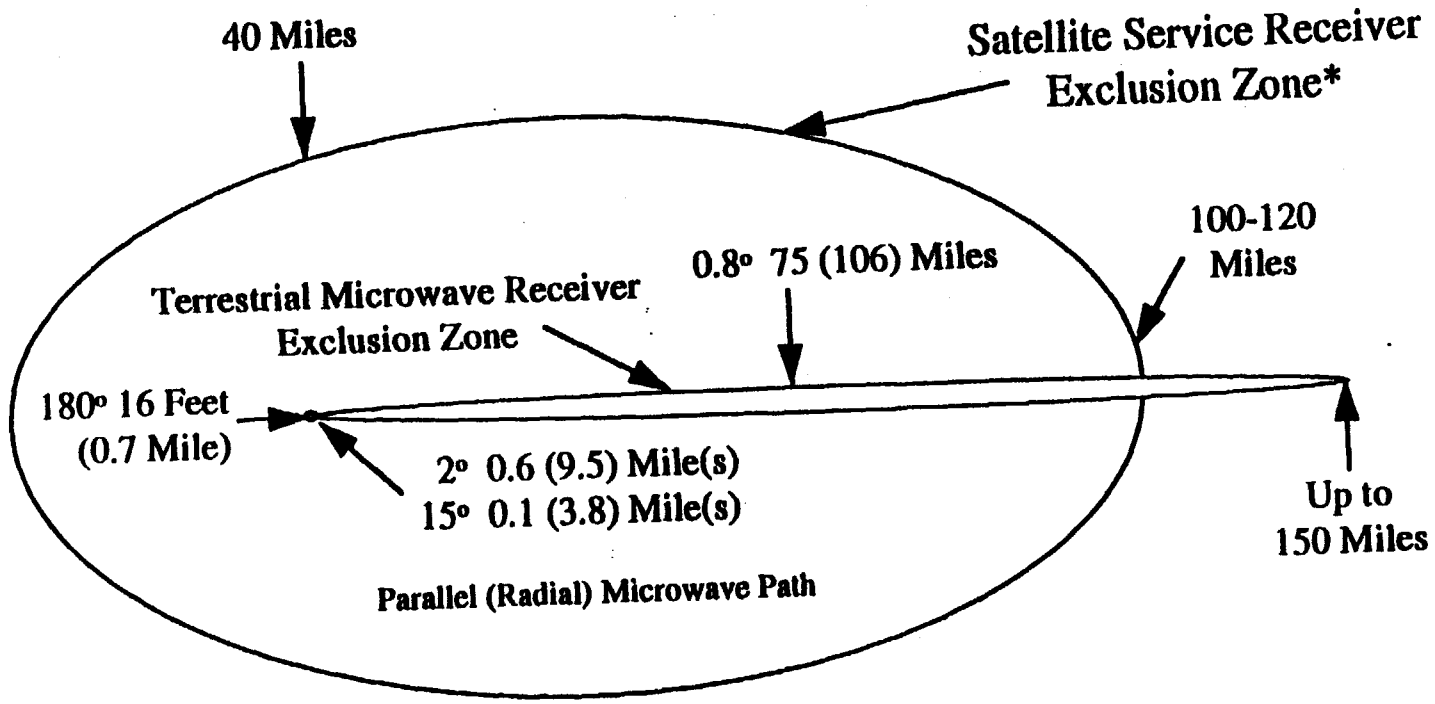
Miles

0 200 400

ATTACHMENT 3

ALCATEL
NETWORK SYSTEMS

Fixed Service Transmitter Exclusion Zones



Satellite Service Uses All Frequencies at All Azimuths Within a Band

Terrestrial Microwave Uses a Pair of Frequencies Within a Narrow Wedge

Upper 6 GHz 6 Ft. Standard FS Antennas

* Curtis, H. E., " Interference between Satellite Communication Systems and Common Carrier Surface Systems," *Bell System Technical Journal*, May 1962, pages 921-943.

ATTACHMENT 4

PART 2

INTERFERENCE BETWEEN FS STATIONS AND NON-GEOSTATIONARY FSS EARTH STATIONS

A study of the sharing possibilities between terrestrial FS stations transmitting in the 18.8 GHz to 19.3 GHz band and receiving in the 28.6 GHz to 29.1 GHz band and NGSO FSS earth stations operating in the same bands was performed using Recommendation ITU-R IS.847 with the values given in Tables 1 and 2. The earth station parameters appropriate for the LEOSAT-1 system and FS parameters taken from Recommendation F.758. For comparison purposes, the same methods were used to compute the coordination area between an earth station of a GSO FSS system and FS systems. The GSO FSS parameters are those appropriate for GSO-13 in the CPM Report to WRC-95.

The results are summarized in Table 3 for four different radio climatic zones. For both the NGSO FSS and the GSO FSS systems, the coordination distance is larger for interference from the FS stations into the FSS earth stations. These results show that the coordination distances between FS stations and NGSO FSS earth stations are comparable to the coordination distances between FS stations and GSO FSS earth stations.

The Recommendation ITU-R IS.847 propagation model only considers one mode (1) propagation mechanism which is applicable for small percentages of the time. At distances less than 100 km, line-of-sight or diffraction paths may occur, and these may give rise to lower losses for large percentages of the time. This may cause the lower long-term interference threshold to be exceeded.

TABLE 1

Coordination distance parameters used for the study of FSS into FS

Parameter	non-GSO	GSO
Pt', transmit power (dBW) in 1MHz	3.7	0.0
Gt', transmit peak gain (dBi)	36	44.4
Discrimination to receiver (dB)	38.2	46.2
Polarization discrimination (dB)	3	3
Gr, FS Receiver peak gain (dBi)	45	45
FS Discrimination to transmitter (dB)	0	0
Ms, FS Fade Margin (dB)	25	25
NL, Additional Noise (dB)	0	0
W, BW factor (dB)	0	0
T, FS Noise temp (K)	1350	1350
B, BW (Hz)	1000000	1000000
Frequency (GHz)	29	29
p (% of time)	0.005	0.005
q, elevation angle	0	0

TABLE 2

Coordination distance parameters used for the study of FS into FSS

Parameter	non-GSO	GSO
Pt, FS tx power (dBW) in 1MHz	-12	-12
Gt, FS transmit peak gain (dBi)	45	45
FS Discrimination to receiver (dB)	0	0
Polarization discrimination (dB)	3	3
Gr, Receiver peak gain (dBi)	33	43.1
Discrimination to transmitter (dB)	33.7	42.9
Ms, Fade Margin (dB)	6	6
NL, Additional Noise (dB)	1	1
W, BW factor (dB)	0	0
T, Noise temp (K)	375	275.4
Frequency (GHz)	19	19
p (% of time)	0.0015	0.0015
q, elevation angle	0	0

TABLE 3

Summary of coordination distances computed*

Coordination distance (km) - FSS ES into FS Receiver (29 GHz)

Radio Climatic Zone:	Zone A1	Zone A2	Zone B	Zone C
Non-GSO FSS into FS:	31.7	26.8	42.1	46.6
GSO FSS into FS:	19.4	16.4	25.8	28.5

Coordination distance (km) - FS Transmitter into FSS ES (19 GHz)

Radio Climatic Zone:	Zone A1	Zone A2	Zone B	Zone C
FS into Non-GSO FSS:	104.7	84.7	139.7	157.2
FS into GSO FSS:	114.7	92.7	153.0	172.2

* In accordance with Recommendation ITU-R IS.847, detailed coordination to distances of 100 km will be required where the computed distance is less than 100 km.

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing Opposition was sent via first class mail, postage prepaid, to the following parties on the 23rd day of September, 1997.

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