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April 14, 1995

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FEDERAL COMMUNICATIONS COMMISSION
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VIA HAND DELIVERY
Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W. - Room 222
Washington, D.C. 20554

Re: IC Docket No. 94-31

Dear Mr. Caton:

On behalf of the Fixed Point-to-Point Communications Section, Network Equipment Division of the Telecommunications Industry Association (TIA), we are filing and original and seven (7) copies of its Reply Comments in the above proceeding.

If additional information is needed, the Commission's staff is requested to communicate with us.

Very truly yours,

FLETCHER, HEALD & HILDRETH, P.L.C.

Leonard R. Raish

Leonard R. Raish
Counsel for United States Satellite
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LRR:dlr
Enclosures

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BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554

In the Matter of	)	
	)	
Preparation for International	)	IC Docket No. 94-31
Telecommunications Union World	)	
Radiocommunications Conference	)	

REPLY COMMENTS

FIXED POINT-TO-POINT COMMUNICATIONS SECTION, NETWORK EQUIPMENT DIVISION OF THE TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA)
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April 14, 1995

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BEFORE THE
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These Reply Comments are submitted in response to Comments received by the Commission on its Second Notice of Inquiry ("Second Notice") in the above cited Docket. The Second Notice proposes to superimpose Mobile Satellite Services (MSS) (including low earth orbit (LEO)) upon several frequency bands already allocated to the terrestrial fixed microwave services. In the comments below, the TIA[1] expresses great concern over these proposals and the Comments the Commission has received thereon because of compatibility problems arising from the addition of MSS feeder links to frequency bands used for terrestrial fixed microwave communications. Terrestrial fixed microwave transmitters/receivers operating in the same bands with NGSO MSS earth station transmitters/receivers would create serious mutual harmful interference.

It is only recently that the Fixed Point-to-Point Communications Section has been able to focus on proposals to superimpose MSS feeder links on terrestrial fixed bands due to other pressing issues involving microwave communications, e.g., the "28 GHz" issue, Docket 92-9, and TSB-10F standard.

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[1]TIA is the acronym for Telecommunications Industry Association. These comments are being filed by the Fixed Point-to-Point Communications Section, Network Equipment Division of the Telecommunications Industry Association (TIA).

I. TERRESTRIAL FIXED MICROWAVE REQUIREMENTS SHOULD NOT BE OVERLOOKED IN WRC-95/97 PREPARATIONS

TIA recognizes that the thrust of WRC-95 and the U.S. preparations therefor are aimed at five principal areas, i.e., implementation of Mobile Satellite Services (MSS), Appendices 30 and 30A, High Frequency Broadcasting (HFBC), the Final Report of the VGE, and agendas for future conferences. The MSS item is, inter alia, concerned with spectrum allocations for feeder links in bands ranging from VHF to the 27.5-29.5 GHz band. The remainder of the items are not of direct or primary concern to TIA but are recognized as being of importance to other parties in this proceeding.

As pointed out in the Second Notice[2], current international provisions permit operation of NGSO MSS feeder links in the FSS subject to provisions of Articles 8, 11, and 29 of the Radio Regulations. The explosive planned growth of NGSO MSS has created problems with respect to continued sharing with the FSS. Understandably, a major portion of the U.S. effort in the preparations for WRC-95 is addressed to this issue.

Noting the foregoing, the concern of TIA is the impact or "fall out" that the MSS versus FSS controversy can have on the traditional terrestrial microwave services which share significant spectrum allocations with the latter service. The matter is touched upon in the Second Notice[3] wherein it is recognized that -- "current provisions fail to protect existing MSS systems from excessive interference caused by fixed service transmitters". TIA's concern is the apparent absence of in-depth consideration in U.S. preparations for WRC-95 for the protection of

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[2]See Second Notice para. 45 et seq.

[3]See Second Notice para. 42.

current and future terrestrial fixed microwave requirements amid all the discussion and desires to satisfy MSS feeder link requirements.

II. TERRESTRIAL FIXED MICROWAVE REQUIREMENTS ARE GROWING RAPIDLY

In order to accommodate the exploding requirements of the "new technologies", spectrum allocations between 1 and 5 GHz have been, or are being, revised to clear out long standing terrestrial microwave operations now existing in that spectrum. While common carriers seem to have converted a substantial part of their below 5GHz fixed microwave operations to fiber optics, there is a continued huge requirement for private microwave service that does not lend itself to fiber, e.g., pipelines, public safety, utilities and industries of all types ranging from banking to forest products. The private users are converting their below 5GHz operations to the 6 GHz band with new requirements being met in the latter band. The practical fact is the 6 GHz band has become virtually saturated already in some metropolitan areas, e.g. Los Angeles, San Francisco, and New York.

Above 10 GHz, particularly on the 23, 28, and 38 GHz bands requirements for terrestrial microwave are escalating as "new technologies" come into operation. For example, PCS, Cellular, LAN, and a multitude of private requirements all have generated operational needs for "back haul" interconnections and relay connections. The FCC has already received hundreds of applications for 38 GHz band frequencies. The FCC is involved in a major rulemaking proceeding concerning the 27.5 - 29.5 GHz band that pits LMDS, traditional microwave, and MSS against each other. Finally 23 GHz band terrestrial microwave usage is growing very rapidly.

A significant point to bear in mind is that, in the course of spectrum allocation planning, the requirements of terrestrial fixed microwave are growing and should not be swept aside in the rush to accommodate "new technologies", i.e., MSS. The real fact is there are other "new technologies" that do require terrestrial microwave systems, e.g. PCS, computer - to - computer data systems. In the drive to accommodate MSS, the Commission should not overlook those other users who have bona fide requirements for terrestrial fixed microwave systems.

III. ET DOCKET NO. 92-9 HAS A CONSEQUENTIAL IMPACT IN THE ABOVE CITED PROCEEDING

In ET Docket No. 92-9 the FCC began the process of redeveloping the 2 GHz spectrum for new telecommunication technologies. The outcome of that process was to reallocate 220 MHZ of the 2 GHz band for PCS and Emerging Technologies (including MSS) use. After much work the fixed microwave industry developed the rules necessary to allow the higher frequency bands (upper and lower 6 GHz and 10/11 GHz) to accept the migration of existing 2 GHz users out of that band. Rules to allow 4 GHz to be used for this migration could not be developed due to significant concern by fixed satellite users that increased utilization of 4 GHz would harm earth satellite receivers. Now the FCC proposes to put incompatible satellite systems in the very bands needed to support PCS!

IV. SHARING SPECTRUM BETWEEN MSS FEEDER LINKS AND OTHER SYSTEMS APPEARS UNREALISTIC; FURTHER STUDY NEEDED

Current fixed point-to-point microwave systems share FCC frequency allocations with fixed satellite systems at 4 GHz (3.7 to 4.2 GHz), lower 6 GHz (5.925 to 6.425 GHz), 11 GHz (10.7 to 11.7 GHz) and 18 GHz (17.7 to 19.7 GHz). From a practical point of view, satellite earth station receivers (space to earth paths) cannot coexist with microwave fixed point-to-point

systems. The inability of fixed microwave systems to exploit the 4 GHz band is a prime example of this problem (The record of Docket 92-9 regarding proposed rules changes to 4 GHz clearly demonstrates this.). Yet, as pointed out in Section I above, MSS communications proponents seem to have brushed aside the difficulty of sharing.

The Second Notice proposes to add mobile satellite feeder link transmitters and receivers in the upper 6 GHz (6.525 to 6.875 GHz) and 11 GHz bands and transmitters in the 18 GHz band. Of course, the earth station receivers would severely limit fixed microwave expansion as has happened already in the case of the 4 GHz band. This point is recognized in the Second Notice at paragraphs 41 and 42 in connection with Resolution 46 of WARC 1992. Unlike the current fixed satellite situation, mobile satellite feeder link transmitters for Low Orbital Satellites (LEO) would cause excessive interference to fixed point-to-point terrestrial microwave receivers. Likewise, fixed point-to-point terrestrial microwave transmitters could interfere with LEOS's receivers. This undesirable situation occurs because the LEOs, unlike synchronous satellites, can appear anywhere in the sky (and will appear at all points of the compass as they go over the horizon). Mutual satellite/terrestrial system interference would occur regardless of the orientation of the terrestrial path.

V. SEVERAL COMMENTERS SEEM TO ASSUME THE ONLY PARTIES AT INTEREST ARE THE FSS AND MSS SERVICES

The band 5925 - 7075 MHZ, for example, is currently allocated on a co-primary basis to fixed, fixed-satellite (earth-to-space) and mobile services. Yet the extensive discussion and comments filed in response to the Second Notice make little, if any, reference to the fixed services. Local/Qualcom, for example, proposes spectrum in the 6650 - 7075 MHZ band also be

allocated on a primary basis to FSS (space-to-earth) which would be limited to non-GSO mobile satellite service feeder links.[4] Not clear is the status of the fixed services. AT&T, in its comments,[5] addresses additionally the problem of PFD limits proposed for the 6825 - 7075 portion of the 5925 - 7075 MHZ band.

COMSAT Mobile Communications (CMC) briefly addresses the 6825 - 7075 MHZ band[6] issue and recommends development of a footnote to assure protection of the FSS GSO Allotment Plan. The Commission might consider a similar fortunate footnote aimed at protection and the taking into account of the terrestrial fixed services.

Mobile Communications Holdings, Inc. in its comments urges the Commission "to increase its proposed 7 GHz NGSO feeder link allocation to include 6725 to 7075 MHZ ----"[7]. Additionally reference is made to "adequate spectrum to allocate at least 300 MHZ to NGSO feeder links". Here again TIA is concerned about a sweeping request for spectrum allocation without reference to the need for taking into account the very extensive use of the same band for terrestrial fixed operations.

VI. 6 GHz BAND IS OF PARTICULAR CONCERN

Fixed satellite earth transmitters currently coexist in the lower 6 GHz fixed point-to-point microwave band. This has not caused a significant limitation to fixed microwave system growth. This is not because earth station transmitters do not cause interference to fixed paths - they do.

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[4]See Loral/Qualcom Comments at Annex 1, page 3.

[5]SUPRA.

[6]See CMC comments at page 13.

[7]See Mobile Communications Holdings, Inc. at page 7 et seq.

The reason such operations are compatible is that the transmitters are in communications with synchronous satellites. Synchronous satellites are positioned along a broad arc that extends across the middle of the sky. Most paths between earth stations and satellite stations are too far above the horizon to affect terrestrial paths which are parallel to the ground. With the exception to two points on the horizon (south east and south west in North America), fixed system transmitters will not be pointed toward satellites nor will earth transmitters be pointed toward fixed microwave receivers. In practice, these interference cases are avoided in all but a few cases by making sure all fixed point-to-point paths avoid the two critical terrestrial paths.

On page 22 (Footnote 72) of the Second Notice it is noted that feeder links allocations are being considered within the Part 21 (common carrier) and Part 94 (private users) 6.525 - 6.875 GHz terrestrial fixed microwave allocation. As mentioned in III supra, that band and the one below (5.925 - 6.425 GHz), both equally congested, have been given a key and difficult role by FCC ET Docket No. 92-9 in 1993. (see Second Report and Order, released on August 13, 1993), i.e., to be a new home for the thousands of microwave systems that are to be relocated soon from the Part 94 and Part 21 2 GHz bands that require the propagation capability of the 6 GHz bands.

In connection with the foregoing, attention is called to Footnote 83 of the Second Notice (at page 25) wherein attention is called "that in some bands there are domestic allocations that could limit feeder link use." TIA would amplify this to reiterate the 6.425 - 7.125 GHz band is, and most importantly, already under extensive use by microwave point-to-point systems that operate in the 6.525 - 6.875 GHz range. That band alone houses more than 11,000 microwave links in the US., a number that will grow considerably as 2 GHz systems are relocated. Broadcast auxiliary services, mentioned in Footnote 83, are allocated in the 6.875 - 7.125 GHz

band which includes about half that number (around 6,000) of microwave links.[8] Any reduction in the terrestrial microwave capabilities of the 6 GHz band or any other band in long haul spectrum now found between 4 and 10 GHz will have substantial negative impact on private and common carrier users of fixed microwave and on the success of the difficult 2 GHz relocation.

VII. COMMENTS OF AT&T ARE SUPPORTED

The 10.7 - 10.95 and 11.2 - 11.45 GHz are two of the bands widely used for terrestrial fixed microwave. TIA concurs with AT&T's statement that there are "thousands" of fixed microwave paths in those bands and that the likelihood of interference should not be overlooked by the Commission. TIA agrees the U.S. should not propose use of the 10.7 - 11.95 and 11.2 - 11.45 GHz bands for MSS feeder links.

AT&T addresses the 6825 - 7075 MHZ band and the 12.75 - 13.25 GHz band and questions the PFD limits the Commission has proposed in the Second Notice.[9] As pointed out in Section VI just above, this band also has thousands of licensees and is one of the replacement bands for terrestrial microwave systems vacating the L-band spectrum in order to accommodate MSS subscriber links. TIA concurs with the views of AT&T and urges the Commission to adopt them.

While the TIA (Fixed Microwave Section) is not directly involved with mobile services, it joins with Motorola to support in principle the concept of mobile High Speed Wireless Data Services (HSWD) that AT&T is proposing for operation in the 5.2 GHz band. TIA is

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[8]Further and under the same note 83, the 10 GHz band is described as a Digital Electronic Messaging Service band, which is no longer the case (see ET Docket No. 92-9).

[9]See Second Notice Appendix 1, pages 16 and 17.

particularly impressed with the provision of a spectrum allocation for HWSD on a worldwide basis. Noting similar spectrum allocations are already available in Europe, TIA agrees adoption of the 5.2 GHz band on a worldwide basis will foster competitiveness of U.S. industry in world markets. The principle of competitiveness in world markets should be given much weight by the Commission as the U.S. prepares for WRC-95.

VIII. INTERSATELLITE LINK ISSUES

Motorola and Iridium in their comments both address the intersatellite issue. Both propose that terrestrial fixed service antennas transmitting more than two degrees above the horizon be limited to a 24 dBw/MHZ EIRP in the 29.0 - 29.5 GHz, and 22.5 - 23.55 GHz bands. This is clearly impractical for point-to-point microwave systems which have a typical capability of 45 dBw EIRP and more. 24 dBw/MHZ would translate into a 28 dBw maximum EIRP for a 2.5 MHZ bandwidth, 1.544 Mb/s radio. Most current 23 GHz microwave radios operating at their lowest power output would not even be able to meet that number if FCC antenna standards are to be followed!

Technical discussion aside, 23 GHz (and "28 GHz" if that band is eventually retained for microwave applications as has been requested by TIA in the course of the 28 GHz proceeding) needs reasonable EIRP levels just to be operable under normal U.S. meteorological conditions i.e., to compensate for rain attenuation. A + 45 dBw EIRP is not a typical number for these conditions and + 55 dBw is an agreed ITU ceiling for that band.

Further, a 2° pointing restriction would also seriously limit the viability of a band whose short, urban area microwave links frequently mandate 5 or 10° pointing angles.

Any "damage" to the minimum capability of the 23 GHz would seriously impede

development of terrestrial PCS in that band which is a twin to the 38 GHz band when it comes time to build a PCS infrastructure.

IX. COMMISSION SHOULD MAKE EVERY EFFORT TO FIND OTHER SPECTRUM FOR MSS FEEDER LINKS

Noting that 200 MHZ is needed to accommodate MSS Feeder other solutions than those proposed in the Second Notice appears available. A review of the recent NTIA Report on U.S. National Spectrum Requirements[10] indicates the 3.7 - 4.2 GHz band would be an ideal selection for MSS Feeder Links. The NTIA Report states that 50% of the fixed service allocation could be converted to other uses within 10 years.

The same NTIA Report also indicates that 275 MHZ in the 12.7 - 13.25 GHz "CARS Band" could become available and therefore should be considered.

X. CONCLUSIONS

Noting the foregoing, it is concluded:

(a) The Commission must recognize the importance of the terrestrial fixed microwave services to the U.S. telecommunications infrastructure as it prepares for WRC-95.

(b) The Commission's Report and Order in Docket 92-9 has a significant impact upon the above cited proceeding.

(c) Superimposition of MSS feeder links upon spectrum already heavily used for terrestrial point-to-point communications presents serious problems of compatibility.

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[10]See Report on U.S. National Spectrum Requirements - Projections and Trends, Department of Commerce, NTIA Special Publication 94-31 released in March 1995, page 80.

(d) Point-to-point microwave communications are expanding, inter alia to support many of the new telecommunications technologies soon to come on line.

(e) Alternative spectrum, e.g. the 3.7 - 4.2 GHz and/or the 12.7 - 13.25 GHz bands offer possibilities for accommodating MSS feeder links and should be considered therefor by the Commission.

Respectfully submitted,

FIXED POINT-TO-POINT COMMUNICATIONS SECTION, NETWORK EQUIPMENT DIVISION OF THE TELECOMMUNICATIONS INDUSTRY ASSOCIATION

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