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DOCKET # 98-142

September 21, 1998

VIA HAND DELIVERY

Magalie Salas, Esquire
Secretary
Federal Communications Commission
1919 M Street, N.W. - Room 222
Washington, D.C. 20554

Re: ET Docket No. 98-142

Dear Ms. Salas:

On behalf of The Fixed Point-to-Point Communications Section, Wireless Communications Division, of the Telecommunications Industry Association (the "Fixed Section"), we are filing an original and four (4) copies of its Comments in the above cited matter.

If there are any questions, please do not hesitate to contact the undersigned.

Respectfully submitted,

FLETCHER, HEALD & HILDRETH, PLC



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LRR:cej
Enclosures

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ORIGINAL

BEFORE THE

Federal Communications Commission

WASHINGTON, D.C. 20554

SEP 21 1998

In the Matter of)
)
Amendment of Parts 2, 25 and 97 of the)
Commission's Rules with Regard to the)
Mobile-Satellite Service Above 1 GHz)

ET Docket No. 98-142

To: The Commission

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

I. INTRODUCTION

The Fixed Point-to-Point Communications Section, Wireless Communications Division, of the Telecommunications Industry Association (the "Fixed Section")¹ hereby comments on the Commission's Notice of Proposed Rulemaking ("Notice") in the above-captioned matter. In the Comments below the Fixed Section points out that the 6 GHz band is a major relocation band for Fixed Services being displaced from the "2 GHz" band. While willing to consider proposals for sharing, the Fixed Section states in the stringent terms the need for a technical showing that the proposed sharing is

¹The Telecommunications Industry Association ("TIA") is the principal industry association representing telecommunications equipment manufacturers, including manufacturers of terrestrial fixed point-to-point microwave radio service ("FS") equipment. Fixed Section members serve, among others, companies, including telephone carriers, utilities, railroads, state and local governments, and cellular carriers, licensed by the Commission to use private and common carrier bands for provision of important and essential telecommunications services. This filing presents only the views of the Fixed Point-to-Point Communications Section.

feasible and will not impact adversely upon the continued use and growth of fixed service operations in the 6700-7075 MHz band.²

II. PAST EXPERIENCE WITH SHARING RAISES CONCERNS

The Fixed Section looks to the experience gained about sharing with satellite services in the 4 GHz band. That band (3.7-4.2 GHz) was also supposed to be a replacement band for terrestrial fixed services forced to vacate the "2 GHz" band. However, it is now almost impossible to coordinate new 4 GHz terrestrial fixed paths in urban areas. Even in rural areas, the frequency coordination process is very difficult. The principal reason is that satellite earth stations are much more susceptible to interference than terrestrial microwave stations. The terrestrial services desire to avoid a similar experience in the 6 GHz band which has now become essential to fixed microwave users.

Much of the FS service concern is based on experience with the practices followed by the Commission in licensing satellite operations. While in principle the spectrum allocation may be "co-primary" between the satellite and the fixed services, experience has shown that sharing is far from co-equal in practice. Satellite earth station operators have an overwhelming preference in access to spectrum, due to a combination of two factors. First, the Commission routinely licenses an earth station for the entire allocated band and full arc, without regard to any actual need for bandwidth or satellite locations, and with no loading requirements. Terrestrial operations, in

²The Fixed Section has no comment as to proposals in the Notice with regard to the 5150-5250 MHz and the 15.43-15.63 GHz bands.

contrast, are generally limited to frequencies actually needed, and additionally are subject to stringent requirements for spectrum efficiency and loading. Second, frequency coordination procedures allow earth stations to "warehouse" huge amounts of licensed but unused spectrum, even if it is desperately needed by terrestrial operators. At 4 GHz, the procedures resulted in freezing new terrestrial services out of the band even though it was designated as a shared band. The Fixed Section urges the Commission to avoid a repeat of the 4 GHz band experience for the fixed service in the 6 GHz band.

III. 6700-6875 MHz BAND IS ALREADY HEAVILY OCCUPIED

There are currently 3032 common carrier and 25744 privately used frequencies licensed in the 6525-6875 MHz band. Additionally, the displaced "2 GHz" band terrestrial fixed operations to be relocated to 6 GHz must be considered. Because these are duplex channels, half of the frequencies are in the 6700-6875 MHz band. With the "2 GHz" band no longer available to terrestrial fixed, the 6 GHz band is the only realistic band available for long haul low capacity use (10 MHz bandwidth and less).

Terrestrial fixed telecommunications is a "growth" industry. Rules that may be adopted for the use of 6700-6875 MHz in the FSS must recognize and provide for this growth. As already stated above as regards the 4 GHz band, a repeat of the problem occurring there should not be allowed at 6 GHz. The main concern are the procedures for earth station coordination, which could, in effect, "sterilize" the 6 GHz band for any future growth of terrestrial fixed operations.

IV. COORDINATION PROCEDURES FOR TERRESTRIAL FIXED AND SATELLITE USERS DISADVANTAGE THE FORMER

Satellite users as well as terrestrial point-to-point users are subject to frequency coordination procedures.³ A proposed station, whether terrestrial or satellite earth station, must show it will not cause interference to a previously licensed station in either service, and must accept interference from previously licensed stations in either service. In principle, these requirements are similar for the two services.

In practice, however, all similarity vanishes. A terrestrial applicant must usually coordinate if it seeks to locate anywhere within 125 to 250 miles of a licensed earth station, depending on terrain, latitude, and other factors. The resulting coordination area is larger than some states. If the earth station is licensed for the entire band – as most are – the terrestrial station must coordinate at any frequency it proposes to use, even if that part of the band is unused by the earth station. But the reverse is not true. A terrestrial station cannot license hundreds of megahertz for which it has no traffic, and by doing so, maintain preemption rights for unused spectrum over tens of thousands of square miles. Yet earth stations routinely do just that. The Commission, as a part of this proceeding, should consider and adopt rules to assure the 6700-7025 MHz remains truly “shared” so the experience at 4 GHz does not recur.

V. TERRESTRIAL SYSTEMS MUST BE PROTECTED FROM INTERFERENCE

While the Commission expresses a “belief” in Para. 22 of the Notice that the power flux density (PFD) limits specified in Footnote No. S9.11A will afford terrestrial

³See generally 47 C.F.R. § 25.203(c), 101-103.

fixed and broadcast auxiliary users of the band with adequate "protection," the Notice contains no support for that proposition. Inasmuch as an experience at 4 GHz has demonstrated that "downlink" satellite transmissions and terrestrial microwave systems realistically cannot co-exist, a proposal to make the 6700-7075 MHz available for downlink satellite transmissions needs strong technical support. It is doubtful that Footnote No. S9.11A would provide many terrestrial systems with the protection they need for the following reasons:

With a typical -76 dBm 10-3 BER threshold for a 10 MHz 1-DS3 or 1-STS1 radio, and assuming a 35 dB designed fade margin, the normal RSL would be -41 dBm. (A 35 dB fade margin at 6 GHz corresponds to a 20 mile path with 99.999% availability in the central US).

S9-11A permits a PFD of -152 dBW/m²/4 kHz in the antenna bore site. This translates to a -59 dBm Interference threshold of the digital radio.

$(-152 \text{ dBW/m}^2/4 \text{ kHz} + 10 \log (10 \text{ MHz}/4\text{kHz}) + 30 \text{ db (dBm-dBw)} + 4.1 \text{ db (8 ft antenna)} + 25 \text{ db (C/I for digital radios)})$

FS radios equipped with automatic transmitter power control (ATPC) would have a normal RSL of -54 dBm (typical back-off of 13 dB). This indicates that a fade of only 5 dB would cause loss of sync.

For a 20 mile path in the central US, the time below a 5 dB fade is 344,000 seconds/year with a per-fade duration of 230 seconds. I.e., a 5 dB fade on this path would occur for 230 seconds per fade around 1,500 times per year. Fade occurrences would be four times worse along Coastal areas. If any of these shallow fades correlate with an interference event, a loss of sync will occur.

In view of the above example, simulations of both GSO and NGSO interference cases must be run, which correlate shallow FS fading with the proposed satellite interference criteria.

Moreover, cross polarization will not help here because satellite systems employ circular polarization and terrestrial system use linear polarization. In sum, the Commission must explore in much more depth than it apparently has the potential of its proposal for interference to terrestrial systems before proceeding further in this matter.

VI. COORDINATION STANDARDS MUST BE ADOPTED

The Commission has not proposed criteria for coordinating new NGSO feeder links and terrestrial systems. It is respectfully submitted that the Commission should require NGSO feeder link applicants to provide details about the technical characteristics of their proposed systems for coordination and for licensing purposes, such as: (a) elevation angle when NGSO begins to transmit and receive; (b) the total downlink operating bandwidth required per gateway; (c) the total aggregate PFD from all the satellites as received at a given point on the earth; (d) the estimated aggregate PFD from any similar systems operating in the same band; (e) number of antennas per earth stations and details about such antennas; (f) receiver characteristics; (g) orbit parameters; and (h) how much shielding can be designed into the earth station to insure FS growth. Moreover, each NGSO applicant must request only the bandwidth the applicant would need for the immediate use plus an additional amount, not to exceed 50%, for future expansion. Without those minimum requirements, effective coordination is not be possible.

VII. THE IMPACT OF THE PROPOSED SHARING OF THE BAND ON TERRESTRIAL MICROWAVE SYSTEMS WOULD BE ENORMOUS

First, it should be noted that while the Commission has proposed to make available for NGSO feeder links 175 MHz of the 6 GHz band, the effect of the proposal would include the entire band. This is because microwave frequencies are assigned in pairs and the 6700-6875 MHz part of the band accommodates only half of the paired channels. Also, geographically, the impact would also be substantial. Assuming, as the Commission has, that each Big Leo satellite system would have six gateways, the total number of gateways would amount to 24-30. Assuming further that these gateways would be in or near population centers, then, the use of the band by the MSS service would deny the terrestrial fixed service the use of the entire 6525-6875 MHz band in the major centers of the country.

VIII. CONCLUSIONS

The terrestrial microwave industry is concerned that adoption of the proposal without significant change as discussed in Section VII above would have a substantial adverse impact on the fixed service, and unnecessarily so. To reduce that impact, the Fixed Section strongly recommends that the Commission adopt sharing criteria so that this critical band for the terrestrial fixed services would continue to accommodate the growth of terrestrial systems as well as the proposed NGSO MSS feeder links. Accordingly, the Fixed Section urges the Commission to conduct technical studies including simulation studies prior to adopting Rules that would, as a minimum, include the sharing criteria. Based on the results of such studies, and in any event, the following coordination criteria should be adopted

(a) NGSO MSS feeder systems must not cause objectionable interference to existing or pre-coordinated terrestrial systems that would be "grandfathered."

(b) Interference protection criteria along the lines of those in Section 101.105 should be adopted.

(c) Applicants for NGSO MSS feeder links must apply for and be authorized only for the bandwidth and arc required for immediate use plus an additional amount not to exceed 50% of that needed for immediate use, and to justify the bandwidth requested.

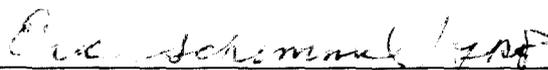
(d) NGSO MSS applicants must submit sufficient technical information, along the lines suggested in Section VI above, with every application for a feeder link and gateway station.

(e) Terrestrial FS system applicants would be required to coordinate with and to protect incumbent and pre-coordinated NGSO MSS feeder links for the bandwidth authorized and for the technical parameters proposed in their applications.

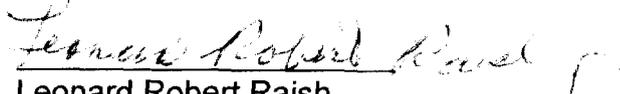
Respectfully submitted

FIXED POINT-TO-POINT COMMUNICATIONS
SECTION NETWORK EQUIPMENT DIVISION
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